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The Sustainability of Fiscal Subsidies in China's Long-
Term Care Insurance Pilots

by

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Abstract

With the acceleration of population ageing, long-term care (LTC) has become a pressing policy challenge. In China, the long-term care insurance (LTCI) pilot programme, launched in 2016 and expanded in 2020 to 49 cities across 29 provinces, represents a major institutional innovation in the social security system. Drawing on policy diffusion theory and the perspective of central-local government relations (央地关系视角), this thesis examines the institutional evolution and fiscal sustainability of China's LTCI pilots.

A structured comparative policy review of the two pilot phases (2016 and 2020) across financing mechanism, benefit design, disability assessment, and public-private partnerships (PPPs) reveals a transition from fragmented local experimentation to emerging standardisation. Key shifts include diversification of funding, expansion of benefits, unification of disability assessments, and refinement of PPP models, though persistent challenges remain, such as regional disparities, fiscal strain, and limited awareness.

For fiscal sustainability, the thesis combines the GM (1,1) grey forecasting model and cell-based aggregate projection models. Demographic and economic indicators are incorporated, and the ratio of subsidies to general public budget revenue (GPBR) is designed as the core measure of fiscal pressure. Simulations of fixed-sum, proportional, and mixed subsidy policies at

municipal, provincial, and national levels highlight marked differences in fiscal viability, showing that sustainability depends critically on local fiscal capacity, subsidy design, and central-local redistribution.

The thesis makes three main contributions: (1) it maps institutional evolution across two pilot phases, demonstrating how central directives and local experimentation co-shaped LTCI development; (2) it pioneers a multi-level quantitative assessment of fiscal sustainability under alternative subsidy schemes; and (3) it offers integrated policy strategies, such as independent legislation, diversified financing, service integration, and digital governance, to enhance long-term equity, efficiency, and sustainability.

In sum, while LTCI pilots have eased unpaid family care pressures and provided valuable institutional experience, their long-term viability will require stronger fiscal frameworks and coordinated multi-actor governance.

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Contents Listings

Table of Contents

Abstract.....	I
Acknowledgements.....	III
Contents Listings	IV
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background	1
1.2 Research Gap and Motivation	7
1.3 Research Aims and Questions	11
1.4 Overview of Methodology	13
1.5 Thesis Structure	16
CHAPTER TWO: UNDERSTANDING CHINA'S LONG-TERM CARE INSURANCE.....	18
2.1 Definition of China's LTCI	18
2.2 The Need for LTCI in China	23
2.2.1 The Growing Level of the Ageing Population	23
2.2.2 Changing Family and Social Structures	26
2.2.3 LTC Costs for Older People Continue to Rise	32
2.2.4 Summary of Section 2.2.....	34
2.3 Development of LTC and LTCI in China	37
2.3.1 Development of LTC Services.....	37
2.3.2 Reform of LTCI.....	44
2.4 Summary	57
CHAPTER THREE: LITERATURE REVIEW.....	60
3.1 Overview	60
3.2 Overview of Existing Research on LTCI in China	62
3.3 Structured Review	65
3.3.1 Search Strategy and Screening Criteria.....	67
3.3.2 Chronological Analysis.....	74
3.3.3 Research Scope	78
3.3.4 Research Perspective.....	92
3.3.5 Methodological Preference	109
3.4 Research Gaps and Analytical Focus.....	127
CHAPTER FOUR: THEORETICAL FOUNDATION	134
4.1 Overview	134
4.2 Frequently Used Theories	137

4.2.1 Evolutionary Game Theory	137
4.2.2 Demand Theory	139
4.2.3 Maslow's Hierarchy of Needs	141
4.2.4 Welfare Pluralism.....	143
4.2.5 Theory of Public Service Chain.....	146
4.3 Theoretical Foundation of This Thesis.....	148
4.3.1 Policy Diffusion Theory	148
4.3.2 The Perspective of Central-Local Government Relations	156
4.3.3 Conceptual Framework of Fiscal Sustainability	160
4.4 Summary	163
CHAPTER FIVE: METHODOLOGY.....	165
5.1 Overview	165
5.2 Structured Comparative Review of LTCI pilot policies	167
5.2.1 Policy Document Database.....	167
5.2.2 Comparative Framework.....	169
5.3 Quantitative Analysis	174
5.3.1 Data Sources	174
5.3.2 Selection of Exemplar Pilot Cities	176
5.3.3 Projection of Subsidised Insured Population – GM (1,1) Model	181
5.3.4 Projection of Government Subsidies – Cell-based Aggregate Projection Model	187
5.4 Summary	193
CHAPTER SIX: STRUCTURED COMPARATIVE POLICY REVIEW.....	196
6.1 Overview	196
6.2 Financing Mechanism.....	198
6.2.1 Financing Sources	198
6.2.2 Financing Methods	205
6.2.3 Annual Funding Standard and Funding Level	212
6.3 Benefit Design	223
6.3.1 Insured Population and Beneficiaries.....	224
6.3.2 Benefit Limit and Benefit Level	231
6.4 Disability Assessment.....	241
6.5 Public-Private Partnerships (PPPs).....	252
6.6 Chapter Summary and Synthesis of Key Findings	265
CHAPTER SEVEN: QUANTITATIVE FINDINGS	267
7.1 Overview	267
7.2 Data Screening and Model Validation.....	268

7.3 Results of Projection	277
7.3.1 Subsidised Population	277
7.3.2 LTCI Fiscal Subsidies in the Financing Stage	292
7.3.3 GPBR and Subsidies-to-GPBR ratio	312
7.4 Chapter Summary and Synthesis of Key Implications	325
CHAPTER EIGHT: DISCUSSION	328
8.1 Overview	328
8.2 Evolution of China's LTCI Pilot Policies	331
8.2.1 Financing Mechanism	331
8.2.2 Benefit Design	342
8.2.3 Disability Assessment	351
8.2.4 Public-Private Partnerships (PPPs)	359
8.3 Analysis of Fiscal Sustainability	376
8.3.1 Subsidised Population	377
8.3.2 Fiscal Subsidy Patterns	386
8.3.3 Fiscal Pressures: From Data Results to Policy Challenges ...	396
8.4 Central-Local Government Relations and Policy Diffusion	402
8.4.1 Central Coordination	403
8.4.2 Regional Competition	405
8.4.3 Local Protectionism	406
8.4.4 Policy Diffusion	408
CHAPTER NINE: CONCLUSION	411
9.1 Main Research Findings	411
9.1.1 Achievement of Research Aims	411
9.1.2 Addressing the Research Questions	413
9.2 Policy Recommendations	417
9.3 Contribution and Potential Limitations	421
9.3.1 Contribution of the Thesis	421
9.3.2 Limitations	422
9.4 Future Outlook	424
References	426
Appendix	463

List of Abbreviations

Abbreviation	Full form
LTCI	Long-term care insurance
LTC	Long-term care
UEBMI	Urban Employee Basic Medical Insurance
NCMS	New Cooperative Medical Scheme
URBMI	Urban Resident Basic Medical Insurance
RBMI	Urban-Rural Resident Basic Medical Insurance (integrates NCMS and URBMI)
BMI	Basic Medical Insurance (includes UEBMI and RBMI)
PPP	Public-private partnership
ADLs	Activities of daily living
IADLs	Instrumental activities of daily living
PPHs	Potentially preventable hospitalisations
GPBR	Local general public budget revenue
OOP	Out-of-pocket
NHS	National Health Service
OADR	Old-age dependency ratio
CNKI	China National Knowledge Infrastructure
CASP	Critical Appraisal Skills Programme
PRISAM	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
CLIP	China Long-Term Care Insurance Policy Database
CHARLS	China Health and Retirement Longitudinal Study
CLHLS	Chinese Longitudinal Healthy Longevity Survey
CLASS	China Longitudinal Ageing Social Survey
ILO	International Labour Organisation
GDP	Gross Domestic Product
HON	Maslow's Hierarchy of Needs
OECD	Organisation for Economic Co-operation and Development
PVBC	Present Value Budget Constraint
EU	European Union
FYP	Five-Year Plan
GVA	Gross Value Added
OLS	ordinary least squares
CAGR	Compound annual growth rate
HCBS	Home- and community-based services

List of Figures

Figure 1 PRISMA flow diagram (Source: Page et al. (2021)).....	72
Figure 2 China's long-term care insurance pilot regions.....	74
Figure 3 Publication trend of included papers (2016–2023)	76
Figure 4 Research scope of included papers	80
Figure 5 Distribution of research scope of included papers	81
Figure 6 Research perspectives of included papers	93
Figure 7 Research perspectives of included Chinese and English papers	94
Figure 8 Methodological preference of included papers	110
Figure 9 Methodological preference of included Chinese and English papers.....	111
Figure 10 The distribution of LTCI pilot cities in China.....	134
Figure 11 Simple representation of a health system (source: Evans-Lacko and Knapp (2017)).....	172
Figure 12 Analytical framework for analysing China's LTCI pilot system	173
Figure 13 Projection steps	269
Figure 14 Projected municipal-level subsidised population (2016–2035)	282
Figure 15 Projected municipal-level subsidised population (2016–2035)	282
Figure 16 Projected municipal-level subsidised population (2016–2035)	283
Figure 17 Projected provincial-level subsidised population (2025–2035)	288
Figure 18 Projected provincial-level subsidised population (2025–2035)	288
Figure 19 Projected provincial-level subsidised population (2025–2035)	289
Figure 20 Projected subsidised population of Sichuan province (2025– 2035)	289
Figure 21 Projected national-level subsidised population (2025–2035)	291
Figure 22 Projected municipal-level LTCI subsidies (2025–2035), below RMB 100 million.....	297
Figure 23 Projected municipal-level LTCI subsidies (2025–2035), above RMB 100 million.....	299

Figure 24 Provincial-level annual fixed-sum LTCI subsidies (2025–2035)	304
Figure 25 Provincial-level annual fixed-sum LTCI subsidies (2025–2035)	305
Figure 26 Provincial-level annual proportional LTCI subsidies (2025–2035)	306
Figure 27 Provincial-level annual mixed LTCI subsidies - Sichuan province (2025–2035)	307
Figure 28 Projected municipal-level GPBR (2025–2035)	314
Figure 29 Projected provincial-level GPBR (2025–2035)	316
Figure 30 Operation mechanism of the ‘government purchasing + commercial insurance companies service model’ (author’s compilation based on CLIP (2023) policy documents)	363
Figure 31 Operation mechanism of the ‘government entrusts + commercial insurance companies agent model’ (author’s compilation based on CLIP (2023) policy documents)	365
Figure 32 Operation mechanism of the ‘government provides subsidy + commercial insurance companies operate model’ (author’s compilation based on CLIP (2023) policy documents)	367

List of Tables

Table 1 Database search summary	69
Table 2 Overview of qualitative research approaches in selected LTCI studies	113
Table 3 Overview of quantitative research approaches in selected LTCI studies	119
Table 4 Overview of mixed-method research approaches in selected LTCI studies	126
Table 5 Fixed-sum subsidy policies in major LTCI pilot cities in China.	180
Table 6 Major LTCI pilot cities in China without government subsidies.	181
Table 7 Proportional and mixed subsidy policies in major LTCI pilot cities in China.	181
Table 8 Criteria for evaluating GM (1,1) forecasting accuracy	187
Table 9 Financing sources of LTCI pilot cities (the first batch)	201
Table 10 Financing sources of LTCI pilot cities (the second batch)	203
Table 11 Financing methods of LTCI pilot cities (the first batch)	209
Table 12 Financing methods of LTCI pilot cities (the second batch)	210

Table 13 The annual funding standards and funding levels of LTCI pilot cities (the first batch).....	217
Table 14 The annual funding standards and funding levels of LTCI pilot cities (the second batch).....	222
Table 15 The insured population and beneficiaries of LTCI pilot cities (the first batch).....	228
Table 16 The insured population and beneficiaries of LTCI pilot cities (the second batch)	230
Table 17 The benefit limits and benefit levels of LTCI pilot cities (the first batch).....	237
Table 18 The benefit limits and benefit levels of LTCI pilot cities (the second batch)	240
Table 19 Institutions for disability assessment of LTCI pilot cities (the first batch).....	250
Table 20 Institutions for disability assessment of LTCI pilot cities (the second batch)	251
Table 21 Participating contents of commercial insurance companies ...	261
Table 22 Involvement level of commercial insurance companies.....	263
Table 23 Evaluation metrics and thresholds for GM (1,1) model validation	270
Table 24 Model validation results for municipal-level subsidised population projection using GM (1,1): evaluation metrics and accuracy ratings.....	271
Table 25 Model validation results for provincial-level subsidised population projection using GM (1,1): evaluation metrics and accuracy ratings.....	272
Table 26 Model validation results for national-level subsidised population projection using GM (1,1): evaluation metrics and accuracy ratings	272
Table 27 Model validation results for municipal-level GPBR projection using GM (1,1): evaluation metrics and accuracy ratings	275
Table 28 Model validation results for provincial-level GPBR projection using GM (1,1): evaluation metrics and accuracy ratings	275
Table 29 Model validation results for national-level GPBR projection using GM (1,1): evaluation metrics and accuracy ratings.....	275
Table 30 Municipal-level subsidised population data under LTCI pilot policies (2016–2024)	278
Table 31 Projected municipal-level subsidised population (2016–2035)	

.....	279
Table 32 Projected provincial-level subsidised population (2025–2035)	285
.....	285
Table 33 Projected national-level subsidised population (2025–2035)	291
Table 34 Municipal-level annual fixed-sum LTCI subsidies (2016–2024)	293
.....	293
Table 35 Municipal-level annual proportional LTCI subsidies (2016–2024)	294
.....	294
Table 36 Municipal-level annual LTCI subsidies (2025–2035) - unit: RMB/year.....	296
Table 37 Provincial-level annual fixed-sum LTCI subsidies (2025–2035)	302
.....	302
Table 38 Provincial-level annual proportional LTCI subsidies (2025–2035)	303
.....	303
Table 39 Provincial-level annual mixed LTCI subsidies (2025–2035) ...	303
Table 40 National-level annual fixed-sum LTCI subsidies (2025–2035)	309
Table 41 National-level annual proportional LTCI subsidies (2025–2035)	311
.....	311
Table 42 National-level annual mixed LTCI subsidies (2025–2035).....	311
Table 43 Municipal-level general public budget revenues (2025–2035)	313
Table 44 Provincial-level general public budget revenues (2025–2035)	316
.....	316
Table 45 National-level general public budget revenues (2025–2035)	318
Table 46 Municipal-level subsidies-to-GPBR ratio (2025–2035).....	319
Table 47 Provincial-level subsidies-to-GPBR ratio (2025–2035).....	321
Table 48 Projected national-level subsidies-to-GPBR ratio assuming policy expansion from pilot provinces (2025–2035).....	323
Table 49 Comparison of the operational effects of the three models (Lu, 2021)	370

List of Appendices

Appendix 1 Summary of selected academic materials	463
Appendix 2 Comparative forecasting performance of GM (1,1), ARIMA, exponential smoothing, and linear regression for insured population	479
Appendix 3 Comparative forecasting performance of GM (1,1), ARIMA, exponential smoothing, and linear regression for GPBR	481

Note on Terminology

The term ‘elderly’ appears in this thesis as a literal translation from Chinese academic and policy discourse. For example, ‘elderly care’ is a rendering of the Chinese term 养老, which in policy discourse refers broadly to the care and support system for older people, including home-, community-, and institution-based services. Other policy-specific terms translated literally include:

1. Elderly care institutions – from 养老机构, referring to residential facilities providing care services for older people in China’s official policy classification;
2. Elderly care services – from 养老服务, referring to a range of services for older people, including home-based care, community care, and residential care;
3. Elderly nursing subsidies – from 老年护理补贴, referring to government-provided financial assistance for older people requiring nursing care;
4. Elderly service centres – from 老年服务中心, referring to community-based facilities that provide non-residential services for older people, such as day care, rehabilitation, social activities, and health management;
5. Elderly care industry – from 养老产业, referring to the broad sector covering care services for older people (institutional, community, and home-based) as well as related products and industries such as assistive devices, housing adaptation, smart technologies, and eldercare finance.

In contemporary English usage, particularly in the UK, the term 'elderly' is often regarded as outdated and potentially ageist. This thesis therefore adopts 'older people' (or, where appropriate, 'older population', 'older adults' or 'older individuals') except when directly citing Chinese sources, where 'elderly' appears in the original translation.

CHAPTER ONE: INTRODUCTION

1.1 Background

Population ageing has emerged as one of the most critical demographic trends in the 21st century, profoundly impacting numerous nations worldwide (United Nations Population Fund, 2012), such as OECD countries (OECD, 2020) and Asian countries (Luk, 2020). According to the World Health Organisation (2025), the global life expectancy reached 73.3 years in 2024, an increase of 8.4 years compared to 1995. According to predictive analysis, the number of older people aged 60 and above worldwide will increase from 1.1 billion to 1.4 billion between 2023 and 2030 (World Health Organisation, 2025). As demographic structures continue to evolve, governments across the globe are increasingly confronted with the formidable challenge of identifying fiscally sustainable approaches to support and care for their ageing populations (OECD, 2020). This issue is particularly pressing in the domains of long-term care (LTC) and healthcare, where rising expenditure may prove financially unsustainable for many nations (OECD, 2020). In response, many countries are either undertaking or will have to undertake significant reforms of their care systems, aiming to contain costs while simultaneously ensuring that individuals in need have access to essential, high-quality care services.

According to Luk et al. (2022), at present, LTC financing worldwide mainly

consists of four types: (1) tax; (2) out-of-pocket (OOP) payment and co-payment; (3) donations; and (4) insurance (compulsory insurance and voluntary insurance). This thesis mainly discusses **insurance**, specifically long-term care insurance (LTCI). A key advantage of insurance lies in its efficiency in the context of risk aversion (Karagiannidou and Wittenberg, 2022). This efficiency, in principle, stems from any form of risk-pooling mechanism, encompassing private insurance, social insurance, as well as tax-funded systems (Karagiannidou and Wittenberg, 2022).

As for compulsory insurance, Germany and Japan are two prominent examples of countries that have implemented this kind of scheme. In 1994, Germany established its LTCI system, which is grounded in mandatory individual contributions. Under this system, individuals who meet the eligibility criteria are legally entitled to receive a defined level of benefits (Joshua, 2017). A key distinction from the system in the United Kingdom is that Germany's LTCI does not involve means-testing or user charges (Joshua, 2017). Japan represents another notable case, having introduced a public LTCI system in 2000. All LTC services under this scheme requires co-payments (Francesca et al., 2011; Ikegami, 2019). Following a series of reforms, the co-payment rate for individuals with higher incomes or pensions increased to 20 per cent in 2014 (Roland et al., 2021). A further reform in 2018 raised the co-payment rate to 30 per cent for those in the highest income brackets (Roland et al., 2021).

As a relative latecomer in the development of LTCI, China launched its first official LTCI pilot programme in 2016. This scheme also takes the form of compulsory insurance, with mandatory participation by individuals enrolled in the Urban Employee Basic Medical Insurance (UEBMI) system. In the early stages of the pilot, funding was primarily drawn from allocations within the basic medical insurance fund pool, supplemented by government subsidies. Over time, the financing structure has gradually expanded to include individual and employer contributions, social donations, and revenues from welfare lotteries, among other sources (CLIP, 2023).

Over the past 70 years, China has undergone a profound demographic transformation (Luk et al., 2022). According to the *China Statistical Yearbook 2023* compiled by the National Bureau of Statistics of China, the country had a population of 1.41 billion in 2022. Among them, the population aged 65 and above had reached 209.8 million. By the end of 2022, the old-age dependency ratio (OADR) stood at 21.8 per cent, indicating that for every 100 individuals of working age (typically defined as 15 to 64), there were approximately 21.8 older individuals requiring support. Geographically, rural areas exhibit higher levels of ageing and a greater proportion of ‘empty-nest older population’¹(空巢老人)

¹ The term ‘empty-nest older population’ (空巢老人) refers to older individuals whose children have grown up and moved out, leaving them living alone or with only a spouse.

compared to urban regions. China is thus confronted with the challenge of 'growing old before becoming rich' (Luk et al., 2022). Notably, life expectancy among the older population has increased significantly, from 67.77 years in 1981 to 77.93 years in 2020 (National Bureau of Statistics, 2023). While people are living longer, many face deteriorating health and rising levels of disability as they age (Luk et al., 2022).

Based on the *First and Second National Sample Surveys on Disability* (which were nationally representative population-based surveys conducted in 1987 and 2006, respectively, and carried out in accordance with the World Health Organisation's International Classification of Functioning, Disability and Health), Luo et al. (2021) projected that by 2030, older individuals with disabilities will account for over 57 per cent of China's total disabled population. This proportion is expected to rise to over 70 per cent by 2050 if effective prevention and control measures are not implemented (Luo et al., 2021). These individuals are expected to experience an average disability duration of 7.44 years (Luo et al., 2021). The rapid growth in the number of disabled older people poses significant challenges to China's LTC system, which is predominantly based on unpaid family care and supplemented by institutional care.

Unpaid family care refers to care provided without financial compensation by a spouse, child, daughter-in-law, son-in-law, other relatives, neighbours and

friends to individuals with care needs (long term illness, disability or challenges related to older age). Institutional care, in the Chinese context, refers to facilities staffed by professional caregivers within a given community that offer basic or specialised nursing services to individuals who are bedridden long-term, older, disabled, terminally ill, or otherwise in need of continuous care. As this thesis focuses on population ageing in China, the care of disabled older adults, and the implementation of the LTCI pilot policy within this context, the discussion of unpaid family care will concentrate primarily on care provided to disabled older adults, rather than on the broader spectrum of unpaid carers who support individuals of all ages.

On the one hand, the rise in nuclear family structures and increasing female labour force participation have led to a decline in the availability of unpaid family caregivers. Consequently, the pressure on combining care and other responsibilities for caregivers has intensified, rendering the traditional family-based care model increasingly unsustainable (Song and Sun, 2020). On the other hand, public services and support for older people remain limited and are primarily directed towards those categorised as ‘special older people in the policy’ (政策中的特殊困难老年人), a term that refers to low-income older individuals who are covered by the ‘Three-Nos’² (三无人员) and ‘Five

² ‘Three-Nos’ (三无人员): no working ability, no source of living, no dependants and caregivers.

Guarantees'³ (五保户) welfare policies. Those with less severe needs or with some form of unpaid support are typically excluded from public assistance or encounter prohibitively high costs and stringent eligibility requirements, making formal care inaccessible for the majority (Song and Sun, 2020).

Despite facing significant challenges, China did not formally initiate a pilot LTCI system until 2016. According to Cao (2018), two primary factors contributed to this delayed response.

First, external fiscal pressure on the government was a critical impetus for the establishment of the LTCI system. At present, the primary responsibility for LTC for older individuals with disabilities rests with individuals and families. The government offers universal subsidies, such as old-age allowances and financial assistance for disabled older people, to support basic living needs. However, as the number of older and disabled individuals continues to rise, the fiscal pressure on the state has intensified, especially in the context of an economic downturn (Cao, 2018). This mounting pressure created an urgent need for a policy intervention capable of mitigating the government's financial strain.

³ Provide five living guarantees for eligible people (children/adults/older people with no working ability, no source of living, no dependants and caregivers), including food, clothing, housing, medical care, and burial/orphan education).

Second, since 2012, China's new administration has placed increased emphasis on social welfare as a cornerstone of national governance. The government has recognised that enhancing citizens' quality of life and raising awareness of social welfare are key to fostering social cohesion (Cao, 2018). This political orientation played a significant role in the eventual rollout of the LTCI system. When a social policy aligns with both public demand and governmental interests, its implementation becomes considerably more feasible (Cao, 2018).

While paid care services exist across different stages of the life course, including childcare and support for adults with disabilities, this thesis focuses specifically on paid and unpaid care in later life. The emphasis is on older adults with LTC needs within the context of population ageing and the development of China's LTCI system. Other forms of paid care are acknowledged as part of the broader care economy but lie outside the scope of this research.

1.2 Research Gap and Motivation

As China's population ages at an unprecedented rate, ensuring adequate and sustainable LTC for older adults has become an urgent policy imperative. In response, China launched its LTCI pilot programme in 2016 and significantly expanded it in 2020, encompassing 49 pilot cities across 29 provinces and regions. The pilot exploration of the LTCI scheme is, in essence, a form of policy

experimentation (Chan and Shi, 2022). Experimentation under hierarchy is regarded as a distinctive model of policy-making in the Chinese government (Heilmann, 2008). This model is often applied to policies that the government intends to implement but for which the specific modalities of execution have yet to be clarified, with the core of the experimentation lying in the selection of the most effective option among multiple alternatives (Heilmann, 2009). In China, the formulation of a new policy is frequently preceded by pilot programmes, through which practical experience is accumulated and distilled into innovative elements, before being institutionalised in the form of formal laws and regulations applicable nationwide (Chen and Zhang, 2025).

While LTCI remains in its pilot stage, the sheer scale of China's population means the implications of this policy will affect tens of millions of individuals. Given that the policy is currently piloted only within mainland China, this thesis focuses specifically on the implementation of LTCI in mainland regions, excluding the LTC frameworks of Hong Kong, Macao, and Taiwan.

A growing body of academic research has explored various dimensions of the LTCI system, including its effects on formal and unpaid caregivers and health outcomes for older individuals with disabilities (Tian et al., 2023; Zhou et al., 2023; Chen et al., 2021b), as well as patterns of healthcare utilisation and medical expenditures (Deng et al., 2022; Tang et al., 2022b; Chen and Ning,

2022). Scholars have also explored the interaction between LTCl and unpaid care, particularly regarding crowding-out and substitution effects (Cao and Xue, 2023; Peng and Wu, 2021), disparities in access and implementation across urban and rural areas (Zhang et al., 2020c; Zhu and Osterle, 2017), and the influence of basic medical insurance frameworks on unpaid caregiving capacity (Chen et al., 2020b).

In addition, research has investigated factors influencing individual participation in LTCl schemes, including enrolment preferences, trust in the system, and policy design attributes (Che and Cheung, 2022; Liu et al., 2022a; Ma et al., 2023). A substantial body of work has also focused on the efficiency and design of the LTCl system, examining issues such as service provision, financial sustainability, policy diffusion, and regional variation in care needs (Lu et al., 2017a; Zhang et al., 2016; Chang et al., 2020; Zhang et al., 2022a; Guo and Li, 2022; Feng et al., 2020; Zhou and Dai, 2021; Li and Kong, 2023). However, several critical gaps persist within the existing literature.

First, from a predictive analysis perspective, few studies have addressed the long-term fiscal sustainability of government subsidies, particularly from the supply side, that is, during the LTCl contribution or premium-financing stage (e.g., fixed-sum subsidies, proportional subsidies, or mixed subsidy models).

This means that most studies tend to conduct predictive analyses from the

demand side, such as focusing on the disabled population or LTC demand. The financial pressure of these subsidies, especially under scenarios of national policy expansion, has received limited empirical investigation. In addition, the governance role of third-party actors, particularly commercial insurance companies operating under public-private partnership (PPP) frameworks, has not been analysed in detail within English-language literature. Although the Chinese central government has formally encouraged greater participation of non-government institutions since 2020, academic research has not kept pace with these institutional developments.

Second, in terms of research scope, much of the existing analysis focuses on the first wave of LTCL pilot cities launched in 2016, with limited attention paid to the second batch of pilot cities introduced in 2020. This second phase introduced significant policy improvements and shows an evolving institutional logic that deserves closer examination.

Third, methodologically, while the GM (1,1) grey forecasting model has been widely used in public finance and demographic modelling, few studies have integrated this approach with cell-based aggregate projection models to project the fiscal sustainability of LTCL-related government subsidies. Current literature includes studies based on municipal, provincial, and national levels. Yet few studies incorporate all three levels in one model to examine the future

expansion of different fiscal subsidy policies for LTCI. The lack of integrated quantitative forecasting limits our understanding of whether these fiscal subsidy programmes under China's LTCI pilot system can remain financially viable in the medium to long term.

Against this backdrop, this thesis aims to address these critical research gaps by conducting a comparative policy analysis of LTCI pilot development alongside a forward-looking quantitative assessment of its fiscal sustainability. Grounded in the theoretical frameworks of policy diffusion and the perspective of central-local government relation⁴ (央地关系视角), this research contributes to advancing understanding of China's distinctive model of policy experimentation, while offering empirical evidence on the sustainability of LTCI innovations in the context of rapid population ageing.

1.3 Research Aims and Questions

This study sets out to examine the evolution and fiscal viability of China's LTCI pilot system, with a particular focus on the role of government subsidies. It is structured around two core research components: a structured comparative policy review and an integrated quantitative modelling exercise.

⁴ The perspective of central-local government relations (央地关系视角): a China-specific angle that examines how the central government and local governments interact in the policy process.

Research Aims

1. To examine the development of China's LTCI pilot system through a structured comparative policy review of the 2016 and 2020 phases across 29 major pilot regions, focusing on four core dimensions: (1) financing mechanism, (2) benefit design, (3) disability assessment, and (4) public-private partnerships (PPPs). This analysis further considers institutional changes and achievements, as well as the challenges and limitations observed across these dimensions.
2. To assess the fiscal sustainability of government subsidies embedded in the LTCI financing process when scaled up to the municipal, provincial, and national levels under alternative policy scenarios. This involves the integration of the GM (1,1) grey forecasting model with cell-based aggregate projection models, thereby providing a comprehensive quantitative assessment of the medium- to long-term financial viability of LTCI expansion.
3. To evaluate the advantages and disadvantages of different subsidy types (fixed-sum, proportional, and mixed) at the municipal, provincial, and national levels, and to analyse the institutional development of China's LTCI system through the lens of central-local government relations. In addition, drawing on policy diffusion theory, this study considers how lessons from local pilot experiences contribute to the broader understanding of LTCI's fiscal sustainability and institutionalisation at the national level.

Research Questions

1. What were the key drivers and patterns of policy evolution in China's LTCI pilots between 2016 and 2020 across the core dimensions of financing mechanism, benefit design, disability assessment, and PPPs?
2. Under what conditions and policy scenarios is the government subsidy mechanism for LTCI fiscally sustainable at higher administrative levels (municipal, provincial, national) in the medium to long term (2025–2035)?
3. How do different subsidy designs (fixed-sum, proportional, mixed) interact with the fiscal capacities and policy priorities at different governmental tiers (municipal, provincial, national)?
4. How have central-local government dynamics and the process of policy diffusion shaped the institutionalisation trajectory of China's LTCI system?

1.4 Overview of Methodology

This thesis primarily employs a comparative and quantitative approach to analyse the policy development and fiscal sustainability of China's LTCI system.

The research design comprises three integrated stages.

First, a structured literature review is conducted to synthesise existing academic work on China's LTCI financing, with a particular focus on financial sustainability, as presented in Chapter Three. In the early stages of the literature review, the discussion refers to the broader concept of **financial sustainability**

because the existing scholarship on China's LTCI pilot primarily situates financing issues within this wider framework. However, outside the literature review chapter, the thesis narrows this conceptual scope to focus specifically on **fiscal sustainability**, which aligns with the study's core analytical concern. This review covers studies published between June 2016 and November 2023 and aimed to address the following four questions:

1. How has the research evidence developed over time, as China's LTCI policy has been piloted and extended?
2. Are there any key differences between English and Chinese literatures?
3. What methodological approaches have been adopted, and how could the current study add value to existing methods?
4. To what extent does the existing literature explore issues of fiscal sustainability, and are there any key gaps in our current knowledge?

The structured literature review provides the conceptual foundation for the subsequent empirical components of this thesis.

Second, a structured comparative policy review is carried out using the *China Pilot Long-Term Care Insurance Policy Database* (CLIP, 2023), as elaborated in Chapters Five and Six. This component focuses on systematically analysing policy documents from both the 2016 and 2020 pilot phases across 29 major pilot cities. Key analytical dimensions include financing mechanism, benefit design, disability assessment, and PPPs.

Third, this thesis undertakes a quantitative assessment of fiscal sustainability using two modelling techniques, as presented in Chapters Five and Seven. The GM (1,1) grey forecasting model is applied to estimate the future size of the subsidised insured population and corresponding the local general public budget revenue (GPBR). Because the data available for China's LTCI pilots are both limited in scope and short in duration, GM (1,1) is particularly suitable as it is designed for small and noisy datasets, making it the most practical option in this context. The model operates by taking a single historical series, smoothing it through an accumulated transformation, estimating the underlying growth pattern and projecting that pattern forward. In essence, it uses past values of a single variable to generate a smoothed trajectory and forecast future values. A detailed introduction to this model is provided in Chapter Five. These projections of the subsidised insured population and the corresponding GPBR are then incorporated into cell-based aggregate projection models (similar in structure to the one used in Glasby et al. (2020)) to estimate government expenditure on LTCI subsidies during the premium-financing stage, under municipal, provincial, and national levels. The analysis examines three subsidy designs (fixed-sum, proportional, and mixed) and evaluates their projected fiscal impact from 2025 to 2035 as a proportion of fiscal revenue (GPBR).

Taken together, these methodological components offer a comprehensive

analytical framework to assess both the institutional evolution and long-term fiscal viability of China's LTCI system under various scenarios of policy expansion. The specific methods and analytical procedures will be elaborated in detail in Chapter Five.

1.5 Thesis Structure

This thesis is organised into nine chapters:

1. Chapter One introduces the research background, identifies key research gaps, outlines the aims and research questions, and provides an overview of the methodology and thesis structure.
2. Chapter Two provides contextual background on China's LTC needs and the development of the LTCI system. It defines LTCI in the Chinese policy context and traces its historical and institutional evolution.
3. Chapter Three offers a structured literature review of existing research on LTCI in China, with a particular focus on fiscal sustainability, highlighting research priorities and identifying the gaps that this thesis seeks to address.
4. Chapter Four presents the theoretical foundation of the study, focusing on policy diffusion theory and central-local government relations perspective (央地关系视角).
5. Chapter Five outlines the methodological approach. It explains the sequential use of a structured comparative policy analysis and quantitative modelling, including the GM (1,1) grey forecasting model and cell-based

aggregate projection models.

6. Chapter Six presents the results of the structured comparative analysis of LTCI pilot policies, focusing on four key dimensions: financing mechanism, benefit design, disability assessment, and PPPs.
7. Chapter Seven reports the findings of the quantitative modelling. It includes model validation, projections of the subsidised population, government subsidy expenditures, and the subsidies-to-GPBR ratio at municipal, provincial, and national levels.
8. Chapter Eight integrates the key findings from Chapters Six and Seven. It highlights institutional changes and policy challenges and limitations, evaluates subsidy designs, and analyses LTCI development through the lens of central-local government relations and policy diffusion.
9. Chapter Nine concludes the thesis by summarising its main contributions, reaffirming how the research aims have been achieved and how the research questions have been addressed, outlining the thesis's limitations, suggesting directions for policy development, acknowledging its limitations, and outlining an outlook.

CHAPTER TWO: UNDERSTANDING CHINA'S LONG-TERM CARE INSURANCE

2.1 Definition of China's LTCI

Long-term care (LTC), also referred to as aged care or social care, encompasses a broad range of services required by individuals with physical, cognitive, or mental impairments that result in functional limitations and prolonged dependence on others (Roberts, 2017; Yuen, 2018; O'Shaughnessy et al., 2007). It primarily supports older adults in two key domains: activities of daily living (ADLs) and instrumental activities of daily living (IADLs) (Luk et al., 2022). ADLs refer to the essential skills needed to perform basic physical tasks, such as personal hygiene, grooming, dressing, toileting, mobility (e.g. transferring or ambulating), and eating (Edemekong et al., 2023). IADLs involve more complex activities that allow individuals to live independently within the community, including cooking, housekeeping, laundry, transportation, and financial management (Guo and Sapra, 2022).

In China, LTC can be understood in both a broad and a narrow sense. In its broad sense, it refers to situations in which an individual, due to accident, illness, or frailty, suffers physical or mental impairment that prevents independent daily living and, over a relatively long period, requires extensive assistance from others in medical care, daily life, or social activities (Jin et al., 2005). It includes not only physiological and psychological care, but also social support services

and other supportive measures (Cao, 2016). In its narrow sense, it refers specifically to daily living care and medical nursing services provided by families, communities, or professional institutions to older people who, because of ageing, chronic illness, or functional impairment, have lost the ability to live independently (Cao, 2016). In this narrower definition, the scope of care includes only assistance with activities of daily living and medical care for older adults with disabilities and does not extend to instrumental activities of daily living or care for cognitive impairment (Cao, 2016). Although LTC can apply to individuals of any age, it most often refers to care for older people in China. The purpose of LTC is to enhance the quality of life and wellbeing of older adults affected by pathological or normal ageing, and it also serves as an important measure for preventing the onset of new illnesses (Jin et al., 2005; Cao, 2016).

While the definition of long-term care insurance (LTCI) varies across countries, the core objective remains broadly consistent. According to the Health Insurance Association of America (1997), the primary aim of LTCI is to protect individuals against the potentially high costs associated with care needs arising from frailty or disability. Birren (2007), one of the pioneers of gerontology and a former president of the American Academy of Geriatrics, defines LTC as a comprehensive range of medical and non-medical services provided to individuals with functional or cognitive impairments affecting daily life. In the United Kingdom (UK), healthcare services provided by the National Health

Service (NHS) are 'free at the point of use', whereas social care services arranged by local authorities are subject to means testing (Comas-Herrera et al., 2006). Social care in the UK may be characterised as a system of practical support for individuals who face significant challenges in performing activities of daily living, such as getting up, washing, dressing, toileting, eating, and ensuring personal safety. Access to social care is contingent upon a comprehensive needs assessment, with eligibility determined through consideration of both assets and income. As a result, only those with limited financial resources typically qualify for publicly funded support (Mayhew et al., 2019).

In the Chinese context, LTCI refers to a type of health insurance that provides financial compensation for various expenses incurred when the insured person, due to ageing, severe or chronic illness, or accidental disability, loses some or all physical functions and becomes unable to live independently (Jin et al., 2005). Such care may involve long-term rehabilitation and supportive nursing in an institution or assistance at home (Jin et al., 2005). The period of care is usually extended, lasting from six months to several years or even more than a decade. Its primary purpose is not full recovery, but rather the maintenance and gradual improvement of the patient's functional capacity and quality of life, or at the very least preventing further deterioration (Jin et al., 2005).

It is important to distinguish between the elderly care services (basic care services available to older adults in China) and the services provided through the LTCL system for older individuals with disabilities. These differences are primarily reflected in two key areas:

First, service coverage and content are different. Basic care services are targeted at the general older population, particularly those categorised as the 'Three-Nos'⁵ (三无人员), the 'Five Guarantees'⁶ (五保户) recipients, those living alone, so-called 'empty-nest older population', and low-income or disabled older people (Dai, 2014). Public care institutions provide free or low-cost services to financially disadvantaged groups, including the 'Three-Nos' and disabled or semi-disabled individuals. In contrast, private non-profit and for-profit care institutions operate on a fee-based model. LTCL, by comparison, offers tiered services based on the assessed level of disability at the time of application, with costs covered by social insurance institutions (Dai, 2014).

Second, the financing mechanisms are different. Basic care services are funded through a combination of central government budget allocations, public financial appropriations, social medical insurance funds, welfare lottery

⁵ 'Three-Nos' (三无人员): no working ability, no source of living, no dependants and caregivers.

⁶ Provide five living guarantees for eligible people (五保户) (children/adults/older people with no working ability, no source of living, no dependants and caregivers), including food, clothing, housing, medical care, and burial/orphan education.

proceeds (earmarked for vulnerable populations such as older adults, people with disabilities, and orphans), and individual contributions. In contrast, LTCI is financed through a more diversified mechanism, including joint contributions from employers and employees, appropriations from social basic medical insurance funds, subsidies from local governments, social donations, and welfare lottery revenues. Notably, there is some overlap in funding sources, such as the use of welfare lottery proceeds and social health insurance funds, for both basic care services and LTCI (Dai, 2014).

Beyond the Chinese context, it is also useful to consider how LTCI systems have developed internationally, as national approaches differ markedly in financing, service delivery, and eligibility structures. Internationally, LTC systems have developed through several distinct institutional pathways. According to Campbell et al. (2009), Scandinavian countries adopted tax-funded and municipally administered LTC systems as a natural extension of their welfare-state tradition, emphasising universal access and publicly delivered services. The Netherlands similarly built on existing local programmes but financed LTC through a separate branch of social insurance embedded in the health system (Campbell et al., 2009). In contrast, Germany, Japan and the Republic of Korea introduced comprehensive LTCI programmes organised as social insurance, each linking eligibility to assessed levels of functional need and financing benefits through mandatory contributions (Campbell et al., 2009).

These models illustrate the diversity of LTC system design, including differences in financing structures, eligibility determination, benefit forms, and the relative roles of family, state and market providers. They also demonstrate that social-insurance-based LTCI has become an increasingly prominent policy option among countries facing rapid population ageing and weakened informal care capacity, providing an institutional template for managing rising long-term care needs (Campbell et al., 2009). These international patterns provide an important reference point for interpreting China's emerging LTCI system, which aligns most closely with the social-insurance model observed in Germany, Japan and Korea.

2.2 The Need for LTCI in China

2.2.1 The Growing Level of the Ageing Population

Countries around the world, including China, are grappling with the challenges posed by ageing populations and the need to ensure adequate care and support for older adults. According to Cao (2016), China has officially entered the stage of an ageing society, defined by the proportion of individuals aged 60 and above exceeding 10 per cent of the total population, and those aged 65 and above surpassing 7 per cent.

Compared to other nations, China's ageing process is marked by several distinctive features:

1. A large and rapidly growing older population. By 2023, the population of older adults aged 65 and over in China reached 217 million, accounting for 15.4 per cent of the national population and approximately one-quarter of the global older population (Chen, 2024). It is projected that China's population aged 65 and above will reach a peak of 425 million in 2057, accounting for between 32.9 per cent and 37.6 per cent of the total population (China Social Security Society, 2022).
2. An extremely rapid ageing trend. China transitioned from an ageing society in 2000 to a deeply ageing society by 2021 in just 21 years, approximately half the time taken by Germany (40 years) and one-sixth that of France (126 years) (Chen, 2024).
3. The pronounced regional disparities in ageing trends. In provinces such as Liaoning and Shanghai, the degree of population ageing has already surpassed or is approaching the levels seen in developed countries, whereas regions like Tibet and Xinjiang have not yet entered, or have only just begun to enter, the stage of population ageing (Chen, 2024).
4. The challenges of advanced ageing and the increasing prevalence of 'empty-nest households'⁷ (空巢家庭) are becoming more pronounced. In 2020, China's population aged 80 and above reached 36.6 million, and it is projected to rise to 159 million by 2050 (China Social Security Society, 2022).

⁷ 'Empty-nest households' (空巢家庭) refers to families where the children have grown up and moved out, leaving only the parent(s) living alone at home. This term is often used to describe the phase in a family's life cycle when parents find themselves living without their children for the first time in many years.

Oldest-old are likely to face more severe health problems, while the growth of the 'empty-nest' and single-living older populations will further weaken the traditional function of family-based care for older people (China Social Security Society, 2022).

The growing ageing population and the increasing demand for LTC represent an emerging social risk that has been accorded greater political priority in China (Zhou and Dai, 2021). Most older adults are likely to require LTC at some stage in their lives. According to Yang et al. (2021b), family care has long been the primary source of support for disabled older people in China. Unpaid care or informal care is generally defined as unpaid assistance provided to frail older individuals by someone with whom they share a social relationship, such as a spouse, child, other relative, neighbour, or friend (Broese van Groenou and De Boer, 2016).

However, the increasing care demands brought about by population ageing, coupled with declining fertility rates, shrinking family sizes, and rapid urbanisation, have placed mounting pressure on families (Yang et al., 2021b). Although unpaid carers continue to play a vital role, growing concerns have emerged regarding the sustainability of relying exclusively on unpaid care in the absence of adequate formal support systems (Yang et al., 2021b). The key issue may not be whether unpaid care will disappear entirely, but rather the

extent to which individuals have genuine choice and autonomy in assuming caregiving responsibilities. Policy responses must therefore focus on mitigating the pressure of unpaid care by expanding access to formal care services and providing meaningful support to unpaid care.

2.2.2 Changing Family and Social Structures

First, there has been a year-on-year increase in the old-age dependency ratio (OADR). According to Eurostat (2018), the OADR refers to the ratio of the population of older economically inactive people (aged 65 and above) to the working-age population (aged 15 to 64). China's implementation of the One-Child Policy in 1979 has significantly contributed to the rise in the OADR, directly affecting the availability of unpaid family care for older adults (Lou and Ci, 2014).

In 2020, the OADR stood at 19.7 per cent, but it is projected to exceed 50 per cent by 2050, implying that every two young people will need to support one older person (China Social Security Society, 2022). A decade earlier, in 2010, the ratio was 11.9 per cent, with each 100 working-age individuals supporting only about 12 older people (National Bureau of Statistics, 2021). With the high costs of both child-rearing and caring for older people, younger generations are increasingly caught under pressure from both sides (China Social Security Society, 2022).

China's prolonged period of low fertility, largely driven by the One-Child Policy (计划生育), has led to a shift in household structure towards smaller, nuclear families, commonly referred to as the '4-2-1' or '4-2-2'⁸ family models. Since the introduction of family planning policies in the 1970s, the average household size has steadily declined, falling from 4.41 persons per household in the third national census in 1982 to 2.62 in the seventh census in 2020. Meanwhile, the OADR rose markedly from 8.0 per cent in 1982 to 21.8 per cent in 2022 (National Bureau of Statistics, 2023). In response to the rapidly declining fertility rate, China officially issued the 'Two-Child Policy'⁹ (二孩政策) in 2015, marking the end of China's 35-year family planning era. Despite this, it cannot immediately alleviate the current situation of a high old-age dependency ratio and high raised burden/pressure of working-age groups.

Second, the nuclear family structure and increased female labour force participation rate weaken the supply capacity of unpaid family care. An et al. (2017) suggest that the '4-2-1, 4-2-2 family' has become the main type of family in China, which to a certain extent leads to a corresponding weakening of the supply of unpaid family care. Traditionally, family support and care for older people is achieved through cohabitation with adult children (usually married

⁸ 4-2-1, 4-2-2 family: four older people, one couple, one or two children

⁹ The Two-Child Policy (comprehensive two-child policy 全面二孩政策) allowed all couples in China to have a second child as a national strategy to mitigate demographic risks.

sons), and women (daughters-in-law) are often the main carers (An et al., 2017). However, over time, more women have entered the labour market, and the supply of unpaid family care has reduced. For example, China's female labour force participation rate was 64 per cent in 2010, much higher than the world average of 49 per cent (International Labour Organisation, 2025). In 2024, it remained at a comparatively high level of 60 per cent, still above the world average of 49 per cent (International Labour Organisation, 2025).

Third, older women face heightened risks in later life due to imbalanced caregiving roles and an uneven gender distribution in ageing. Women have traditionally served as the primary providers of unpaid family care, yet they also make up a higher proportion of the older population, creating structural vulnerabilities in care provision (Du et al., 2004; Han et al., 2020).

Although women account for a smaller share of China's total population, 48.92 per cent compared to 51.08 per cent for men, there are more women than men aged 65 and above (National Bureau of Statistics, 2023). In 2022, 7.81 per cent of the population were women aged 65 and over, compared to 7.04 per cent for men, indicating that over 10 million more women than men fall into this age group (National Bureau of Statistics, 2023). This gender disparity is primarily driven by differences in life expectancy. In 1981, life expectancy for Chinese men was 66.28 years, while for women it was 69.27 years. By 2015, this had

increased to 75.37 years for men and 80.88 years for women, widening the gender gap from approximately three to over five years (National Bureau of Statistics, 2023). As a result, many women outlive their spouses and may face older age alone.

Given the increasing ageing, the gender gap is also widening (Han et al., 2020). Women often serve as unpaid family caregivers. Therefore, many older women who outlive their spouses face ageing alone, with no one to provide them with the same care they once gave (An et al., 2017). Because of the increased female labour force participation rate mentioned above, other women in the family (daughters and daughters-in-law) will also be unable to provide these older women with adequate unpaid family care due to their work. This gender imbalance directly leads to the weakening of the unpaid family care supply capacity of traditional families (Dai, 2016; An et al., 2017).

Fourth, population mobility aggravates the above three points, that is, the large-scale rural-to-urban migration further weakens the home care supply capacity of traditional Chinese families (Du et al., 2004; Han et al., 2020). This internal migration (i.e., population movement within the country) has led to significant geographic disparities in the age structure of the population, with a higher proportion of older adults now residing in rural areas compared to urban centres (Han et al., 2020).

According to the National Bureau of Statistics (2021), China recorded 376 million internal migrants in 2020, with an increase of 129 million since 2015. These migrants are predominantly younger adults relocating from rural to urban areas in search of employment opportunities. As a result, many older people remain in their original rural communities and become 'empty-nest older population', living apart from their adult children.

Older adults in rural areas are thus doubly disadvantaged. They face not only limited access to formal care services due to regional economic disparities but also a reduced supply of unpaid care, as family members, especially women, migrate for work and engage in formal employment (Yang and Tan, 2019). The combined effects of demographic ageing, declining fertility, increased female labour participation, and internal migration have significantly strained the traditional home-based care model in rural China (Yang and Tan, 2019).

For all the reasons outlined above, unpaid family care is no longer sufficient to meet the growing needs of China's older population. This form of care can lead to significant psychological and health problems for caregivers (Liu et al., 2017). Common physical symptoms include fatigue, while some individuals experience moderate to severe depression and anxiety (Liu et al., 2017). Moreover, caregiving responsibilities can negatively affect their employment

and income status (Rubin and White-Means, 2009; Heitumeller, 2007). Chen et al. (2021b)'s review found that public satisfaction with the LTCI scheme was generally high. The implementation of LTCI reduced the workload of informal caregivers and also decreased the amount of time they spent providing care to recipients (Chen et al., 2021b).

LTCI serves as an effective instrument to support the growing demand for basic and daily care services among older adults and individuals with disabilities (Chen et al., 2021b). Considering the four critical factors previously discussed, there is an urgent need for new and sustainable measures (such as LTCI) to ensure the provision of long-term care services. These factors are (Dai, 2016; Yang et al., 2021b; An et al., 2017):

1. The rising old-age dependency ratio (OADR): A consistent year-on-year increase that pressures the care system.
2. The weakening of unpaid family care: Driven by the prevalence of nuclear family structures and rising female labour force participation.
3. The heightened vulnerability of older women: Resulting from historically imbalanced caregiving roles and a distinctly gendered pattern of ageing.
4. The exacerbating effect of population mobility: Particularly large-scale rural-to-urban migration, which depletes the traditional home-based care pool in rural areas.

2.2.3 LTC Costs for Older People Continue to Rise

To promote an age-friendly environment, the National Health Commission of the People's Republic of China (2019) launched the *Health Promotion Action for Older People* as part of the broader *Healthy China Action (2019-2030)* strategy in July 2019. According to this plan, the incidence rate of disability among individuals aged 65–74 was 18.3 per cent in 2015, and an estimated 5.56 per cent of people aged 65 and above were living with dementia. Changes in the size of the disabled older population are expected to significantly influence future trends in LTC costs.

As early as 2015, Hu et al. (2015) conducted a monetary needs forecast for LTC services for disabled older adults in China, using 2011 as the baseline and drawing on data from the 2010 national census. Their analysis predicted substantial increases in demand across several care domains. Among daily living assistance services, meal assistance was expected to experience the fastest growth, with potential demand reaching RMB 1,306.9 billion by 2050. Dressing assistance followed, with projected costs of RMB 186.275 billion. In the area of healthcare services, rehabilitation therapy and medication needs were forecasted to reach RMB 745.578 billion and RMB 390.843 billion, respectively, by 2050. Regarding psychological comfort services, end-of-life care expenses were projected to grow significantly, with total costs rising from RMB 86.229 billion in 2014 to RMB 1,218.885 billion by 2050. Overall, the total

potential demand for LTC services was predicted to surge dramatically, from RMB 308.996 billion in 2014 to RMB 4,269.534 by 2050.

Five years later, Zhang et al. (2020a)'s study used the data of the seventh Chinese Longitudinal Healthy Longevity Survey (CLHLS) conducted in 2014. This study indicated that the total cost of LTC services is projected to reach RMB 8,530.8 billion by 2050. Additionally, the total cost and growth rate of care in urban areas are expected to surpass those in rural areas, with urban care costs rising from RMB 427.7 in 2020 to RMB 6,843.7 billion by 2050, representing a 16-fold increase. Furthermore, by 2050, the per capita care cost in urban areas is predicted to be six times higher than in 2020, while in rural areas it is expected to be eleven times higher. The forecast shows a sharp increase in the total cost of care for disabled older people between 2020 and 2050, particularly from 2030 to 2050.

According to An et al. (2017), there is a dual issue here: demographic and social changes mean that current provision simply cannot cope with current and future demands. Existing insurance systems only provide protection against the risk of disease (medical costs), not the costs of people with LTC needs. Thus, existing support is neither sufficient nor sustainable. Left unchecked, these issues will cause harm to individual older people and their families, place pressure on health and other public services and generate massive economic

costs (An et al., 2017). As a result, addressing the issue of care for older persons and establishing a LTCI system has become a critical challenge in the process of building a moderately prosperous society¹⁰ (小康社会) in all respects in China – and indeed (because of the sheer size of China and its rapidly ageing population) across the world.

2.2.4 Summary of Section 2.2

In summary, this section argues that there are two primary reasons why China's government chose to pilot LTCI. First, the financial loss caused by population ageing is an uncertain and socially shared risk. Second, the intrinsic features of insurance products make LTCI an effective mechanism for managing this type of financial risk.

With ongoing improvements in quality of life and continuous advances in medical technology, life expectancy in China has steadily increased. As a result, the proportion of older adults, particularly those in the middle-old and oldest-old age groups, continues to rise. According to Cao (2018), the probability of disability in the Chinese population increases with age. In this context, disability refers to older individuals who are frail or unable to care for themselves due to ageing, chronic illness, or other factors such as accidental injury (Zeng and Li,

¹⁰ Moderately prosperous society (小康社会), signifying a stage of development beyond the satisfaction of basic needs, characterised by relative comfort, stability, and an overall improvement in citizens' quality of life.

2003; Jin et al., 2005). Generally, the older a person is, the more likely they are to experience functional decline or disability. However, not every older individual will necessarily require LTC, making the financial risk associated with care needs highly uncertain. Older people cannot predict whether they will maintain independent functioning or require extensive care in later life and therefore find it difficult to estimate the potential costs associated with LTC services – even when assuming a state of disability. In addition, LTC may be delivered either through unpaid family caregivers or by professionally trained and licensed formal care providers (Cao, 2018). However, the quality and scope of unpaid care remain limited, and its impact on functional recovery tends to be modest (Cao, 2018). Consequently, LTC needs should not be seen as individual-specific risks but rather as shared social risks (Cao, 2018). As ageing accelerates, a growing number of people will face the risk of disability, leading to greater financial losses and mounting social consequences.

Barr (2010) outlines four conditions under which a risk can be effectively managed through insurance. First, there must be a large number of homogeneous risk units, as the law of large numbers underpins insurance operations and allows for accurate forecasting of future losses. Second, the losses must be economically measurable and difficult to falsify. Third, the risk must be accidental rather than inevitable. Fourth, losses must not be catastrophic in nature; that is, they should not simultaneously affect a large

proportion of the insured population. The risk of long-term disability among older people in China meets all four of these criteria: it is widespread, statistically stable, economically quantifiable, and non-catastrophic. Thus, the risk conforms to the above four prerequisites, indicating that the financial loss caused by population ageing can be effectively dealt with by implementing a new insurance product (LTCI) (Cao, 2018).

Dai (2016) argues that if China gradually starts experimenting with LTCI, what Chinese scholars term ‘the socialisation of hospitalisation’ might be alleviated. This notion, which is specific to the Chinese context and lacks a precise English equivalent, refers to a social phenomenon in which patients, often older people, remain in hospitals for extended periods owing to non-medical factors such as the absence of family care or a shortage of beds in care institutions for older people (Wang and Ju, 2020). Comparable expressions in English include bed-blocking, long-term hospitalisation due to lack of post-discharge care, and non-medical hospitalisation. Some scholars have proposed ‘potentially preventable hospitalisations, PPHs’, that is, if timely prevention and appropriate LTC services can be provided, these old people do not need hospitalisation (Russo et al., 2006). This is in line with the ‘9073’ and ‘9064’¹¹ old-age service goals proposed in China’s Shanghai and Beijing between 2007 and 2015.

¹¹ 9073, 9064: Unpaid family care services account for 90 per cent, community care services account for 7 per cent or 6 per cent, and institutional care services account for 3 per cent or 4 per cent.

Dai (2016) believes that these goals will be more effectively achieved if they can get the support of LTCI funds. Of course, these issues are not unique to China. Other health and social care systems around the world also grapple with how to reduce emergency hospital admissions among older adults and ensure timely and appropriate hospital discharge (see, for example, Glasby et al. (2019)). Meeting the care needs of the older population has therefore become an increasingly important social and policy concern in China. Given the country's size and the pace of population ageing, it also represents a challenge of broader relevance to other ageing societies around the world.

2.3 Development of LTC and LTCI in China

2.3.1 Development of LTC Services

In China, a country that has experienced profound changes through the development and transformation of a 'socialist market economy'¹² (社会主义市场经济), LTC services have evolved through six distinct phases (Luk et al., 2022). These include: (1) a residual approach (1949 to the mid-1980s); (2) the socialisation of social welfare (mid-1980s to the 1990s); (3) the establishment of standards for aged care facilities and care workers (early 2000s); (4) the development of a three-tiered care model (2006–2014); (5) the integration of

¹² Socialist market economy (社会主义市场经济), a unique Chinese innovation, is an economic system that integrates market forces for resource allocation within an overarching framework of state ownership and socialist policies, aiming to achieve both economic efficiency and social equity.

medical and aged care services (2015 to present); and (6) the piloting of the LTCI system (2016 to present).

Stage 1: A Residual Approach (1949 to the mid-1980s)

During this period, the Chinese government provided LTC services in a way that was shaped by Confucian concepts of filial piety (Zhang, 2013). LTC services following the residual approach offered limited coverage and restricted service provisions due to inadequate state funding (Mok and Liu, 1999). Care for older people has traditionally been the responsibility of the family (spouses, children, in-laws, particularly daughters-in-law) and the government mainly plays a residual role in looking after childless and disabled older people (Zhang, 2013). Against this historical backdrop, older adults receiving institutional care faced stigmatisation (Zhan et al., 2006). Because it was unimaginable for most families to consider placing a loved one in an institution under the care of strangers (Luk et al., 2022). Additionally, during the period of the Cultural Revolution (1966-1976) the care services provided by government almost stopped (Dai, 2019).

Stage 2: The Socialisation of Social Welfare (Mid-1980s to 1990s)

In 1986, the Ministry of Civil Affairs proposed the policy of 'Social Welfare Socialisation' (社会福利社会化). It denoted a policy framework within the socialist market economy wherein societal welfare, under state guidance and

through multi-stakeholder investment, extends coverage across all social strata (Gong, 2009). Social welfare socialisation facilitated non-remunerative spiritual enrichment and material distribution, embodying a collective responsibility and entitlement system that prioritises support and care for vulnerable groups (Gong, 2009). It developed and reformed new directions for social welfare through the use of diversified service providers and funding sources (Dai, 2019).

In terms of LTC services, the goals changed to (Shum et al., 2015; Wong and Leung, 2012; Luk et al., 2022):

1. Establish a diversified service system consisting of nursing homes and community services, as well as various service providers from the public, private, and collective sectors.
2. Financing LTC services through a combination of government grants, public donations, and fees paid by service users.
3. Permitting state-run social welfare institutions to admit older individuals who can afford to pay for their LTC, while the primary responsibility for providing care to the 'three noes' rests with local governments.

In 1998, the *Provisional Regulations on the Registration and Management of Civil, Non-enterprise Institutions* was enacted, which had encouraged non-governmental organisations to set up nursing homes to provide LTC for older individuals (Luk et al., 2022).

Stage 3: The Establishment of Standards for Care Institutions and Care Workers for Older People (Early 2000s)

In the early 2000s, the Chinese government began to formalise and standardise the LTC sector through regulatory initiatives targeting both care institutions and care workers. The Ministry of Civil Affairs (2001) issued the *Basic Standards for Social Welfare Institutions for Older People* to regulate the operation of different types of aged care facilities, such as aged homes, senior apartments (comparable to retirement flats or sheltered housing), nursing homes, and older people's service centres (Feng et al., 2014). These standards outlined general guidelines for meals, personal care, rehabilitation, and psychosocial services. The Ministry of Labour and Social Security (2002) issued the *National Occupational Standards for Care Workers for Older People*, which set out the basic education and training requirements for individuals providing daily living assistance or care for older people. However, it is widely acknowledged that very few workers actually meet these basic requirements (Feng et al., 2012).

Stage 4: The Development of a Three-Tiered Model (2006–2014)

In 2006, the *Opinion on Accelerating the Development of the Elderly Services Industry* was jointly issued by ten ministries and commissions (General Office of the State Council of China, 2006), including the Office of the National Commission on Ageing, National Development and Reform Commission,

Ministry of Education, Ministry of Civil Affairs, Ministry of Labour and Social Security, Ministry of Finance, Ministry of Housing and Urban-Rural Development, Ministry of Health, Population and Family Planning Commission, and the State Administration of Taxation. This policy document marked a significant step in shaping China's LTC landscape, as it introduced a three-tiered care model. The model prioritised home-based care as the foundation, supported by community services, with institutional care serving as a supplementary option.

In 2008, the same group of ministries and commissions mandated the establishment of a national network of home-based care services for older people in urban communities, encouraging the development of diverse care options with wide coverage. They also called for the creation of comprehensive welfare service centres for older adults in 80 per cent of rural areas, integrating residential, community, and home-based care. In the years that followed, the three-tiered model was further developed and refined through a series of policy initiatives (not listed individually here). This period laid the groundwork for a more structured and accessible care system for older people, gradually shifting from a fragmented model to a more coordinated framework of service delivery across different settings.

Stage 5: The Integration of Medical and Aged Care Services (医养融合)

(2015 to Present)

In response to the challenges of population ageing and to enhance the quality of life for older adults, the National Health Commission and the State Council of China launched a series of policy initiatives aimed at developing a more comprehensive approach to elder care. Initially, China's social aged care system focused on providing only basic care services. Over time, however, it has moved toward a model that integrates medical and aged care services, an approach that seeks to combine daily living support with medical treatment and rehabilitation in a more coordinated manner (Luk et al., 2022).

Traditionally, medical care and aged care services in China have been delivered through separate systems. Hospitals are responsible for medical treatment, while aged care institutions (like nursing homes in the UK) provide non-medical support. As a result, disabled or frail older adults have faced challenges in accessing both types of services simultaneously and in the same setting. The development of medical units within aged care facilities aims to address this gap by ensuring that older adults receive timely diagnoses and qualified medical care when needed (Luk et al., 2022).

In June 2016, the Office of the National Health and Family Planning Commission and the Ministry of Civil Affairs selected 50 cities, including Beijing

and Shanghai, as the first batch of national pilot sites for integrated medical and aged care services. In September 2016, an additional 40 cities were designated for the second round of pilot implementation. By July 2017, a total of 5,814 institutions were providing integrated medical and aged care services, though these accounted for just 4 per cent of all aged care institutions in China (Luk et al., 2022). *The 14th Five-Year Plan: National Ageing Development and Older People Service System Planning* launched by the State Council of China in 2021 proposes the 'Internet +' plan, which refers to improving the quality of the 'Integration of Medical and Aged Care Services' scheme through big data and distance services (remote diagnosis, treatment, and monitoring) (State Council, 2021).

Stage 6: The Pilot of the LTCI System (2016 to Present)

Population ageing and the growing proportion of disabled older adults are global trends, and the resulting increase in care needs has posed significant challenges for China (Zhang and Fang, 2021). In response, several provincial and local governments began piloting LTCI programmes, with the first wave of pilots launched in 2016 and a second wave following in 2020.

Despite these developments, the LTCI system remains on the pilot stage and has yet to be fully implemented at the national level (Song and Sun, 2020).

Currently, the LTC system for disabled older people in China is still experimental,

with significant variation in design and implementation across regions. The reform of LTCI in China will be explained in detail in Section 2.3.2.

2.3.2 Reform of LTCI

China's unique approach to social policy formulation typically involves implementing pilot programs in select pioneering cities (Li and Otani, 2018). These pilot projects allow for experimentation and adaptation of policies in localised settings (Li and Otani, 2018). Once successful practices are identified, the central authorities integrate these experiences into the broader national policy framework, ensuring that reforms are well-tested and suited to the country's diverse regions (Li and Otani, 2018).

The Ministry of Human Resources and Social Security of the People's Republic of China (2016) issued the *Guiding Opinions of the General Office of the Ministry of Human Resources and Social Security on Launching the Pilot Project of the Long-Term Care Insurance System [2016] No.80* (hereafter referred to as the *No.80 document*), marking the official initiation of LTCI in China. This signalled that China had officially entered the piloting phase of LTCI. After four years, the National Healthcare Security Administration of China and Ministry of Finance (2020) jointly issued the *Guiding Opinions of the National Health Insurance Administration and the Ministry of Finance on Expanding the Pilot Program of the Long-Term Care Insurance System. Yi Bao Fa [2020]*

No.37 (hereafter referred to as the *No.37 document*), indicating that the piloting of LTCI had entered an expansion phase.

Although China's LTCI has evolved through a domestic trajectory shaped by demographic change, institutional legacies and policy experimentation, its emerging system aligns closely with the international social-insurance model adopted by Germany, Japan and Korea. As Campbell et al. (2009) observe, these countries introduced LTCI through a process of linking demographic and fiscal pressures with a feasible institutional solution, namely, mandatory social insurance with assessed eligibility levels and a mixed delivery system. China's pilots similarly combine social insurance financing with a structured disability assessment and a benefits package centred on in-kind care services, although adapted to domestic conditions by embedding LTCI within the Basic Medical Insurance (BMI) framework rather than creating an independent fund. This positioning indicates that China's LTCI development is consistent with broader international patterns in which social-insurance-based LTCI has diffused as a viable policy response to population ageing and the erosion of traditional family care.

This section will next examine the key reforms to LTCI policy during this transition period, focusing on six core elements: pilot cities, policy objectives, insured population, beneficiaries and benefits, financing sources, and payment

mechanisms for care services. Given that this thesis examines the fiscal sustainability of LTCI under different subsidy arrangements, a separate subsection will subsequently clarify the institutional role of subsidies and benefits within China's LTCI framework, in order to guide readers who may be unfamiliar with these mechanisms.

Pilot Cities

In the *No.80 document*, 15 cities across 14 provinces were designated as the first batch of pilot cities for China's LTCI system. These included Chengde (Hebei Province), Changchun (Jilin Province), Qiqihar (Heilongjiang Province), Shanghai Municipality, Nantong and Suzhou (Jiangsu Province), Ningbo (Zhejiang Province), Anqing (Anhui Province), Shangrao (Jiangxi Province), Qingdao (Shandong Province), Jingmen (Hubei Province), Guangzhou (Guangdong Province), Chongqing Municipality, Chengdu (Sichuan Province), and Shihezi in the Xinjiang Production and Construction Corps¹³. Among these, Jilin and Shandong Provinces were highlighted as key pilot areas. In addition to Changchun, other cities participating in the pilot within Jilin included Jilin, Tonghua, Songyuan, Meihekou, and Hunchun. In Shandong, the pilot was significantly scaled up to cover a total of 16 cities, including Jinan, Zibo, Zaozhuang, Dongying, Yantai, Weifang, Jining, Tai'an, Weihai, Rizhao, Linyi,

¹³ Shihezi is a city that, while geographically situated within the Xinjiang Uighur Autonomous Region, is administered directly by the Xinjiang Production and Construction Corps (XPCC) – a unique provincial-level entity that integrates political, administrative, military, and economic functions. Unlike other cities in China, it operates under the XPCC's jurisdiction rather than that of the ordinary regional government.

Dezhou, Liaocheng, Binzhou, and Heze, alongside Qingdao.

Although official documentation listed 35 cities as part of the initial pilot phase, both government and academic discussions have predominantly focused on the 15 key pilot cities specified in *No.80 document*. As the LTCI initiative evolved after 2020, different terminologies emerged, such as references to ‘29 pilot cities and regions’ or ‘49 pilot cities’. These variations reflect differences in emphasis or administrative classification but are all situated within the same overarching policy framework.

Under the *No.37 document* issued in 2020, an additional 14 cities from 14 provinces were incorporated into the expanded pilot programme. These included Shijingshan District (Beijing Municipality), Tianjin Municipality, Jincheng (Shanxi Province), Hohhot (Inner Mongolia Province), Panjin (Liaoning Province), Fuzhou (Fujian Province), Kaifeng (Henan Province), Xiangtan (Hunan Province), Nanning (Guangxi Zhuang Autonomous Region), Qianxinan Buyei and Miao Autonomous Prefecture (Guizhou Province), Kunming (Yunnan Province), Hanzhong (Shaanxi Province), Gannan Tibetan Autonomous Prefecture (Gansu Province), and Urumqi (Xinjiang Uygur Autonomous Region).

The expansion of the LTCI pilot demonstrates a clear policy trajectory: from

initial concentration in the more economically developed southeastern coastal regions, the programme gradually extended to include central and western areas, reflecting an effort to test the policy across China's diverse geographic and socioeconomic contexts.

Objectives

According to the *No.80 document*, the primary objective of the initial pilot was to explore the establishment of a social insurance system funded through pooled contributions based on the principle of mutual social assistance. This system was intended to offer financial or in-kind support for basic daily care and healthcare services closely linked to the essential living needs of individuals with long-term disabilities. The aim was to accumulate experience during a one-to two-year pilot period and to strive, by the end of the 13th Five-Year Plan, to establish a policy framework for LTCI suited to China's socialist market economy system.

The primary tasks during this phase were to explore policy systems related to coverage, premium contributions, and benefit payments; to develop standards and management methods for assessing care needs and determining care levels; to explore evaluation methods for the quality of services provided by LTC institutions and personnel, agreement management, and cost settlement; and to explore standards and operational mechanisms for LTCI management and

services.

In the *No.37 document*, while the pilot goals remained unchanged, the primary tasks were updated. The aim was to establish, by the end of the 14th Five-Year Plan, a policy framework for LTCI that aligns with China's economic development and the trends of an ageing population, promoting the establishment of a multi-tiered LTC system to meet the diverse needs of the public.

The progress thus far suggests that the initial pilot implementation has established a basic structure for the LTCI system, with policy priorities transitioning from exploratory system design to broader institutional development and national rollout.

Insured Population

In China, enrolment in the LTCI system is closely linked to an individual's Basic Medical Insurance (BMI) status, as the two systems are administratively and financially integrated to ensure comprehensive coverage (Chang et al., 2020).

The BMI system is a publicly funded, mandatory scheme financed through a mix of individual contributions, employer payments, and government subsidies.

It consists of two primary components:

1. Urban Employee Basic Medical Insurance (UEBMI) – Primarily covers urban employees in the formal sector, including both active and retired workers. Some flexible workers may also enrol on an individual basis.
2. Urban-Rural Resident Basic Medical Insurance (URRBMI, hereafter abbreviated as RBMI) – Provides coverage for urban and rural residents not enrolled in UEBMI, including children, students, older adults, unemployed persons, and informal workers. It was established in 2016 through the integration of the New Cooperative Medical Scheme (NCMS) and the Urban Resident Basic Medical Insurance (URBMI).

Although coverage is nearly universal, eligibility and benefit levels vary significantly by region, as they are tied to an individual's household registration (hukou, 户口) or employment status (Zhu and Osterle, 2017). This leads to disparities in access to care and reimbursement rates across different areas. The system is not free at the point of use, as most services require co-payments or deductibles, though it does offer substantial financial protection. Private health insurance exists but plays only a supplementary role. Given this institutional linkage, individuals are generally only eligible for LTCI in pilot cities if they are already enrolled in BMI, either through employment or residency-based schemes.

According to the *No.80 document*, during the initial pilot phase, the LTCI system

primarily covered individuals enrolled in the UEBMI. Pilot regions were encouraged to take local conditions into consideration and to strike a balance between fund collection and service provision, allowing them to define the scope of enrolment in a flexible and context-specific manner. As the system developed, pilot regions were expected to gradually expand coverage in line with changing population needs and available resources.

In the expansion phase, the *No.37 document* did not introduce major changes to the definition of the insured population. The pilot continued to focus on employees enrolled in basic medical insurance schemes. However, regions with adequate resources were encouraged to progressively broaden the scope of coverage, considering factors such as local economic development, funding capacity, and service demand.

Guided by the flexibility allowed in both documents, several pilot cities have extended LTCI coverage beyond UEBMI participants to include individuals enrolled in the RBMI. Notable examples include Suzhou, Jingmen, and Changchun, where broader enrolment strategies have been adopted to enhance equity and inclusiveness in LTC access.

Beneficiaries and Benefits

In the *No.80 document*, the LTCI system was designed to support insured

individuals experiencing long-term disability, with a primary focus on covering the costs of essential daily care and medically necessary services related to basic living needs, particularly for those with severe disabilities. Pilot regions were given discretion to define priority beneficiary groups and specific benefit packages based on the financial capacity of local funds. Over time, regions were encouraged to gradually adjust the scope of coverage and benefit levels in accordance with local economic development.

The *No.37 document* reinforced this focus by emphasising the prioritisation of eligible older individuals with disabilities, especially those with severe functional impairments. While other groups with disabilities were mentioned, the LTCI system remains primarily focused on supporting older individuals with disabilities, as it was introduced to address the accelerating ageing population in China (Li and Otani, 2018).

After undergoing a disability assessment to determine eligibility, benefits for participants include partial reimbursement of expenses related to services for Activities of Daily Living (ADLs), as well as associated medical and nursing care costs (Luk et al., 2022). Each pilot city has the authority to define the criteria for qualified beneficiaries and specify the benefits covered under the LTCI program (Luk et al., 2022).

Due to the simplicity and ease of use of the Activities of Daily Living (ADLs) scale, most pilot regions adopt it as the primary tool for disability assessment (Cao and Li, 2020). However, the ADLs scale fails to accurately reflect the disability status of individuals with cognitive impairments (Cao and Li, 2020). As a result, cities such as Shanghai, Suzhou, and Qingdao have developed localised comprehensive assessment scales for care needs, employing composite evaluation tools to accurately assess the LTC service needs of disabled older individuals (Cao and Li, 2020).

Additionally, there are significant differences in assessment standards among pilot regions. Most areas determine beneficiaries based on the Barthel Index and the ADLs scale, using a score below a predetermined threshold as a criterion for benefits, but a unified scoring standard has not been established (Cao and Li, 2020). Due to the absence of a unified model, various programs that support specific approaches to delivering LTC are implemented across different pilot regions (Zhou and Dai, 2021). This results in policy fragmentation, with each program exhibiting unique characteristics in essential dimensions (Zhou and Dai, 2021).

Financing Sources

In the initial phase of the pilot program, the *No.80 document* indicates that LTCI is financed by funds transferred from the social pooling fund of the UEBMI. The

goal is to gradually explore the establishment of a multi-channel financing mechanism for LTCI based on mutual assistance and shared responsibility, adhering to the principle of 'matching revenue with expenditure, achieving balance, and maintaining a slight surplus'.

In the expansion phase, the *No.37 document* further refines the financing mechanism. The document suggests that funding primarily comes from employee contributions, with employers and employees sharing contributions proportionally. The employer's contribution is based on the total salary of employees, and during the initial stage, funds can be drawn from the social pooling fund of UEBMI without increasing the employer's pressure. Employee contributions are based on their personal income and can be deducted from their social pooling fund of UEBMI. Regions with sufficient resources may explore additional financing channels, such as fiscal support, and provide appropriate subsidies for contributions made by retired workers facing special difficulties.

In cities where enrollees of the RBMI are included, financing sources also comprise allocations from the resident medical insurance fund. Other financing channels include social donations (such as Chengdu and Chengde), welfare lotteries (such as Nantong and Shihezi), etc (Cao and Li, 2020). Such diversity reflects China's continued testing of sustainable, locally tailored LTCI funding

mechanisms.

Payment for Services

The LTCI fund payment level is controlled at approximately 70 per cent, with specific eligibility conditions and payment ratios determined by the pilot regions.

This means that, for approved care services, around 70 per cent of the expenditure is paid by the LTCI fund, while the remaining share is borne by beneficiaries. This provision is the same in documents *No.80 document* and *No.37 document*. According to the *No.80 document* and *No.37 document*, pilot cities can designate LTC providers through contractual agreements, allowing flexibility in benefit packages and payment methods across different locations. Payment models can be structured as fee-for-service or based on per diem rates. Reimbursements from the LTCI fund may take the form of either fixed payments per service type or a percentage of the total service cost.

Notably, LTCI does not offer cash benefits. In addition, aside from the insurance premiums, there are no limits placed on the service fees that providers may charge users, allowing providers to set their own pricing for services not covered or fully reimbursed by the LTCI system (Luk et al., 2022).

The Role of Subsidies and Benefits in China's LTCI System

One essential feature of China's LTCI system is the institutional role played by

subsidies and benefits. Subsidies constitute a foundational mechanism that enables the system to operate sustainably during its pilot phase and beyond. Although government involvement varies considerably across pilot cities and subsidies may be introduced at multiple stages of LTCI operation, this thesis focuses specifically on subsidies embedded in the financing stage, as the analytical objective is to assess the fiscal sustainability of alternative funding arrangements. Other forms of governmental support that arise outside the financing stage are therefore not examined in detail.

As mentioned in the subsection 'Financing Sources', because LTCI is embedded within the BMI framework, a substantial share of its initial funding derives from transfers from the medical insurance pooling fund, complemented in some cities by direct fiscal subsidies and earmarked resources such as welfare lottery revenues. These subsidies serve several purposes: they lower the financial threshold for participation at the early stage of policy experimentation; they stabilise the funding base in regions with limited fiscal capacity; and they ensure that the programme can cover high-need groups, particularly severely disabled older adults, without imposing unaffordable contributions on households. Benefits, in turn, represent the core substantive output of the LTCI system. In China, LTCI benefits primarily take the form of in-kind services rather than cash payments, reflecting the policy objective of ensuring access to essential care rather than providing unrestricted income

support. Covered benefits typically include basic daily living assistance, institutional or home-based LTC services, and medically-related nursing care. The primary policy rationale behind these benefits is to alleviate the heavy burden traditionally borne by families, to reduce avoidable hospitalisation among frail older adults, and to foster the development of a formal LTC service market. Benefit generosity is therefore closely tied to the programme's social protection objective rather than to a pure actuarial logic.

Subsidies and benefits together shape the overall functioning of China's LTCI system. Subsidies provide the financial scaffolding that enables broad coverage and equitable access, especially during the pilot phase when risk pools are small and expenditure patterns remain uncertain. Benefits translate this financial structure into tangible support, redistributing resources towards individuals with high levels of functional dependency. Understanding this interaction is essential for interpreting China's LTCI as a social insurance mechanism: subsidies underpin solidarity within the system, while benefits operationalise that solidarity through targeted service provision.

2.4 Summary

Ageing is a continuous and long-term process experienced throughout an individual's life course (Yang et al., 2021b). At the second King's College London Symposium on Ageing and Long-Term Care in China, scholars

highlighted that unpaid caregiving remains the predominant mode of support for older individuals with disabilities (Yang et al., 2021b). However, the sustainability of dependence on familial support has been compromised by evolving demographic compositions and swift socioeconomic transformations in numerous ageing societies, China being a notable example (Yang et al., 2021b). This assertion underscores the imperative for the establishment of a formal care system and necessitates meticulous government planning in the structuring of its LTC framework to guarantee equitable accessibility and funding provisions for the demographic of older people.

In conclusion, this chapter presented China's LTCI from three aspects: its definition, the need for LTCI in China, and the development and reform of LTC and LTCI, thereby paving the way for a better understanding of the pilot policy. The next chapter is organised into two sections: the first provides an overview of existing research on LTCI in China, and the second presents a structured literature review that systematically analyses the financial sustainability of LTCI, focusing on four dimensions: publication trends, research scopes, research perspectives, and methodological preferences. China's adoption of a social-insurance-oriented LTCI framework also reflects broader international trends discussed in the comparative literature. As shown in Campbell et al. (2009)'s analysis of Germany, Japan and Korea, countries facing similar demographic and fiscal pressures increasingly converge toward social-insurance-based LTCI

as a feasible institutional solution. Accordingly, China's LTCI pilots can be understood not only as a domestic response to ageing but also as part of a wider cross-national pattern of policy development in long-term care.

CHAPTER THREE: LITERATURE REVIEW

3.1 Overview

According to the findings of the *Fourth Sample Survey on the Living Conditions of Urban and Rural Older People in China*, released in October 2016 by the National Institute on Ageing, the Ministry of Civil Affairs, and the Ministry of Finance, the number of disabled and semi-disabled older individuals in China has reached 40.63 million, accounting for 18.3 per cent of the total older population (Xinhua News Agency, 2016).

This substantial increase in the number of disabled older individuals highlights a critical facet of China's ageing demographic (Song, 2016). Scholars have projected that by 2050, the number of disabled older people in China will rise to approximately 129 million, with around 28.8 per cent of individuals aged 60 and above experiencing disability (Li and Diao, 2019). According to United Nations standards, a society is considered an 'ageing society' when individuals aged 60 and over comprise 10 per cent of the total population. By the mid-21st century, China will not only be facing an advanced stage of population ageing, but approximately one in every four older individuals will also be living with a disability.

This profound demographic shift presents significant challenges to the development of public health and elder care systems. In response, China

launched long-term care insurance (LTCI) pilot programmes, with the first phase beginning in June 2016 and the second in September 2020. From its initial policy design to pilot implementation, China's LTCI initiative has attracted widespread academic attention and has generated a substantial body of interdisciplinary research (discussed in detail below). Existing studies have primarily focused on the following areas: (1) the experiences of beneficiaries and carers; (2) the relationship between LTCI and public healthcare provision; (3) individuals' preferences and willingness to participate in LTCI schemes; and (4) the overall design of the LTCI system. While the thesis ultimately concentrates on the fiscal sustainability of the financing structure underpinning China's LTCI pilot system, the literature review necessarily begins with the broader notion of financial sustainability, which encompasses individual contributions, household affordability, employer contributions, the balance of basic medical insurance funds, and the role of government subsidies. This chapter therefore provides a structured review of the literature on financial sustainability, surveying the various conceptual perspectives, methodological approaches, and empirical conclusions that have emerged in relation to the pilot reforms.

To provide an understanding of existing research on LTCI in China, Section 3.2 offers a brief overview of previous studies. This is followed by a structured literature review. Section 3.3.1 introduces the search and screening strategy

employed in the structured review, as well as its overarching purpose. Sections 3.3.2 to 3.3.5 systematically analyses prior research on the financial sustainability of China's LTCI, focusing on four dimensions: publication trends, research scopes, research perspectives, and methodological preferences. Finally, Section 3.4 summarises the influence of existing studies on the design of the research framework for this thesis and identifies key research gaps.

3.2 Overview of Existing Research on LTCI in China

To provide a foundational understanding of the broader field of LTCI research in China, this section offers a narrative overview of key thematic areas explored in the existing literature. It is important to distinguish this from the subsequent structured review (Section 3.3), which will focus systematically on the specific sub-topic of ***financial sustainability***. The themes summarised here were identified inductively, based on predominant keywords and recurrent concepts within the literature, reflecting the diverse topics that scholars have prioritised. This broad thematic mapping aims to contextualise the more focused, systematic analysis of financing sustainability that follows.

First, research has focused on the beneficiaries and carers of the LTCI system. This includes studies examining the impact of the pilot policy on formal and unpaid caregivers, disabled older adults, and residents' quality of life and health outcomes (Tian et al., 2023; Zhou et al., 2023; Chen et al., 2021b). Some of

these studies explore the relationship between LTCI and unpaid family care, particularly in terms of crowding-out and substitution effects (Cao and Xue, 2023; Peng and Wu, 2021). Others highlight disparities and inequalities in the implementation of the system between urban and rural areas (Zhang et al., 2020c; Zhu and Osterle, 2017).

The prevailing consensus suggests that the implementation of the LTCI system offers benefits for both recipients and carers. However, several challenges remain. For example, Wu et al. (2020) argue that stroke and dementia are common conditions leading to LTCI claims, yet the Barthel Index is insufficient for accurately assessing and classifying claimants with these conditions. Additionally, household registration status, rather than actual place of residence, intensifies urban-rural disparities in unmet long-term care (LTC) needs (Zhu and Osterle, 2017).

Second, a significant body of research examines the relationship between LTCI and public healthcare provision. This line of inquiry focuses on the impact of LTCI policy on healthcare utilisation, medical expenditure, and the public medical insurance system. The implementation of LTCI has demonstrable effects on the broader healthcare system, particularly in relation to the frequency and cost of outpatient visits and hospitalisations, out-of-pocket medical expenses, and the financial implications for pooled funds and individual

accounts within the public medical insurance framework (Deng et al., 2022; Tang et al., 2022b). For instance, Chen and Ning (2022) report that the introduction of LTCI has led to a reduction in the number of outpatient consultations, hospital admissions, and lengths of hospital stay.

However, as China's LTCI pilots are currently embedded within the public medical insurance framework, coverage is primarily extended to participants in the Urban Employee Basic Medical Insurance (UEBMI) and the Urban-Rural Resident Basic Medical Insurance (RBMI) schemes. The extent to which families can provide unpaid care is closely linked to the type of public insurance they are affiliated with (Chen et al., 2020b). Older adults with disabilities who lack enrolment in any public healthcare insurance scheme or who are unable to afford LTC services face significant access barriers (Chen et al., 2020b).

Third, some research has also explored individuals' preferences and willingness to participate in LTCI schemes. This includes analyses of the factors influencing decision-making regarding LTCI enrolment, such as individuals' purchase intentions, preferences for policy design, trust in the system, and perceived policy efficacy (Che and Cheung, 2022; Liu et al., 2022a). For example, Ma et al. (2023) employ a discrete choice experiment (DCE) to elicit preferences among potential LTCI beneficiaries under a hypothetical scenario involving functional impairment. Their findings suggest that preferences are

significantly shaped by factors such as the type of care facility, scope of services, reimbursement rate, type of caregiver, and the annual premium. In addition, personal characteristics, such as gender, employment status, and educational background, contribute to variations in LTC preferences (Ma et al., 2023).

Fourth, a considerable volume of research has focused on the design of the LTCl system itself. This includes analyses of care providers within the pilot framework, access to services, the demand for unpaid family care, financial requirements, and regional variations in the need for LTC services (Lu et al., 2017a; Zhang et al., 2016; Chang et al., 2020). Scholars have also examined the LTCl pilot system from diverse theoretical perspectives (Cao, 2018; Dai, 2023), and have evaluated its financial sustainability and affordability from both governmental and household standpoints, focusing on aspects such as expenditure levels, public subsidies, and contribution rates (Zhang et al., 2022a; Guo and Li, 2022; Zhang et al., 2020b). Furthermore, topics such as policy diffusion, document analysis, policy design, and the evaluation of implementation challenges and pilot performance have been explored (Feng et al., 2020; Zhou and Dai, 2021; Li and Kong, 2023).

3.3 Structured Review

Currently, China's LTCl policy remains in a pilot phase, involving 49 pilot cities across 29 regions, and has yet to be fully implemented at the national level.

Since the inception of the pilot, scholars have conducted both qualitative and quantitative studies from various perspectives to evaluate the current implementation of the policy, explore its future feasibility, and assess the financial sustainability of expanding the pilot to a broader scope.

An analysis of the selected literature reveals a growing academic interest in the financial sustainability of China's LTCI pilot policy since its launch in 2016. Although the number of publications fluctuated annually, there is an overall upward trend in research output from 2016 to 2023. In terms of research scope, both Chinese- and English-language studies predominantly focus on the first batch of pilot cities, with 23 Chinese and 7 English papers addressing this group. In contrast, English-language literature shows a relatively balanced distribution of attention between the first batch and the national level. In both language groups, limited attention has been paid to the second batch of pilot cities (7 papers in total), and research concerning non-pilot cities is extremely scarce (2 papers only).

Of the 55 selected publications, 16 employed qualitative approaches, 36 adopted quantitative methods, and 3 used mixed-methods designs. To examine thematic and analytical differences, these studies were categorised into six key research perspectives, based on a synthesis of the studies' stated keywords, recurrent concepts, and the primary focuses of their abstracts and full texts:

1. contribution rate and individual affordability,
2. cost projection,
3. financing efficiency,
4. fund balance and impact factors,
5. funding level and payer affordability,
6. policy design and financing mechanism.

The analysis reveals noticeable variations in thematic emphasis between Chinese- and English-language research.

The subsequent sections are structured as follows: Section 3.3.1 outlines the search strategy and screening criteria. Sections 3.3.2 to 3.3.5 present the results of the structured review in four dimensions: chronological analysis, research scope, research perspective, and methodological preference.

3.3.1 Search Strategy and Screening Criteria

This structured review examines peer-reviewed literature on China's LTCI pilot policy published between June 2016 and November 2023, with a primary focus on financial sustainability. The selected studies address six thematic areas: (1) contribution rates and individual affordability; (2) cost projections; (3) financing efficiency; (4) fund balance and impact factors; (5) funding levels and payer affordability; and (6) policy design and financing mechanisms. The review involved searches across 14 international English-language databases (e.g.,

MEDLINE, IBSS, PubMed) and the Chinese-language China National Knowledge Infrastructure (CNKI) database. Following a three-stage screening process, 15 English-language and 40 Chinese-language articles were included for analysis. Excluded from the review were dissertations, meeting abstracts, editorial materials, letters, proceedings papers, and miscellaneous formats such as news reports, opinion pieces, comments, international comparative studies, and research focused on Hong Kong, Macau, and Taiwan (with further explanation provided later).

The investigations aim to assess the current research landscape on China's LTCI, with a particular focus on its financial sustainability, and seek to answer the following four questions:

1. How has the research evidence developed over time, as China's LTCI policy has been piloted and extended?
2. Are there any key differences between English and Chinese literatures?
3. What methodological approaches have been adopted, and how could the current study add value to existing methods?
4. To what extent does the existing literature explore issues of fiscal sustainability, and are there any key gaps in our current knowledge?

The selection of these specific databases is guided by the objective of capturing research outcomes across a broad range of fields, with particular emphasis on

social care and social policy. Accordingly, this chapter incorporates databases that curate research relevant to the domains of social sciences, healthcare, and medical care. The review considered fourteen international English-language databases and one Chinese-language database, China National Knowledge Infrastructure (CNKI). The international databases included: ABI/INFORM Global, MEDLINE, AMED, ASSIA, IBSS, ProQuest Social Sciences, Scopus, Social Policy and Practice, HMIC, PsycINFO, EMBASE, Web of Science, PubMed, and PsycARTICLES.

In the preliminary search, combinations of the keywords ‘long-term care’, ‘long-term care insurance’, ‘LTCI’, ‘China’, ‘Chinese’, and ‘pilot’ were employed using the Boolean operators ‘AND’ and ‘OR’ to maximise the breadth and variety of retrieved materials. As of November 2023, a total of 1,647 records were identified and screened for further analysis (as shown in Table 1).

Table 1 Database search summary

Database Search and Screening Results					
Search term used	('long-term care' OR 'long-term care insurance' OR 'LTCI' OR 'long-term care insurance pilot') AND ('China' OR 'Chinese')				
English-language					
Database	Result	Date of search and screening	For title/abstract screening	For full-text screening	Final for inclusion in review
ABI/INFORM Global, MEDLINE, AMED, ASSIA, IBSS, ProQuest Social Sciences, ScoPus, Social Policy and Practice, HMIC, PsysInfo, EMBASE, Web of Science, PubMed, PsycArticle	n=689	16 October 2023 and 20 November 2023	n=158	n=65	n=15
Chinese-language					
Database	Result	Date of search and screening	For title/abstract screening	For full-text screening	Final for inclusion in review
the China National Knowledge Infrastructure (CNKI)	n=958	16 October 2023 and 20 November 2023	n=626	n=94	n=40
Total	n=1647	/	n=784	n=159	n=55

In terms of publication date, this chapter limits the review to studies published between June 2016 and November 2023. While the term 'long-term care insurance' appeared earlier in academic literature, the selected time frame reflects the official launch of China's LTCI pilot policy in June 2016, ensuring that the review accurately captures research specifically related to the pilot phase. The earliest article with 'long-term care insurance' in its title found on CNKI dates back to 1998 (Fang, 1998), which discusses the lessons China could draw from the LTCI system in the United States. Similarly, the earliest relevant article in the Web of Science was published in 2009 (Jia and Zhang, 2009), analysing the design of China's LTCI system. However, these earlier works predate the formal policy implementation and were therefore excluded from the review period. The end of the time range was defined by the date on which the final search and screening process was completed.

Given that this structured literature review focuses on the financial sustainability of China's LTCI pilot policy, the inclusion criteria were developed in alignment with this research objective. Eligible materials comprised (1) peer-reviewed publications presenting original research related to the financial sustainability of China's LTCI; (2) studies analysing the design of financing mechanisms; and (3) studies offering projections of LTCI-related budgets. To ensure analytical rigour and comparability across sources, particular emphasis was placed on

the inclusion of empirically grounded research. This was especially pertinent for Chinese-language literature, where a considerable proportion of publications are descriptive or commentary-based. Accordingly, priority was given to empirical studies published in academic journals, to maintain methodological consistency with the English-language literature and to enhance the scholarly quality of the review.

In addition to the inclusion criteria outlined above, certain types of documents were excluded from the review. These included dissertations, meeting abstracts, editorial materials, letters, proceedings papers, and miscellaneous formats such as news articles, opinion pieces, and commentaries. To maintain the relevance and specificity of the review, the scope was confined to literature focusing on the LTCI pilot policy as implemented in mainland China. Accordingly, studies concerning Hong Kong, Macau, and Taiwan, as well as those adopting a broader international comparative perspective, were not included in the final selection. While the structured review is limited to literature focused on mainland China's LTCI pilot system, comparative international studies will be incorporated in the discussion chapter to contextualise the findings and inform broader policy reflections.

All retrieved publication materials were exported to Excel via EndNote and analysed through a multi-stage screening process (as illustrated in Figure 1).

The initial step involved retrieving records from the selected databases, followed by the removal of duplicate entries. The second stage of screening was conducted based on the titles and abstracts of the remaining studies. In the third and final stage, full-text content was reviewed to determine eligibility for inclusion in the structured review.

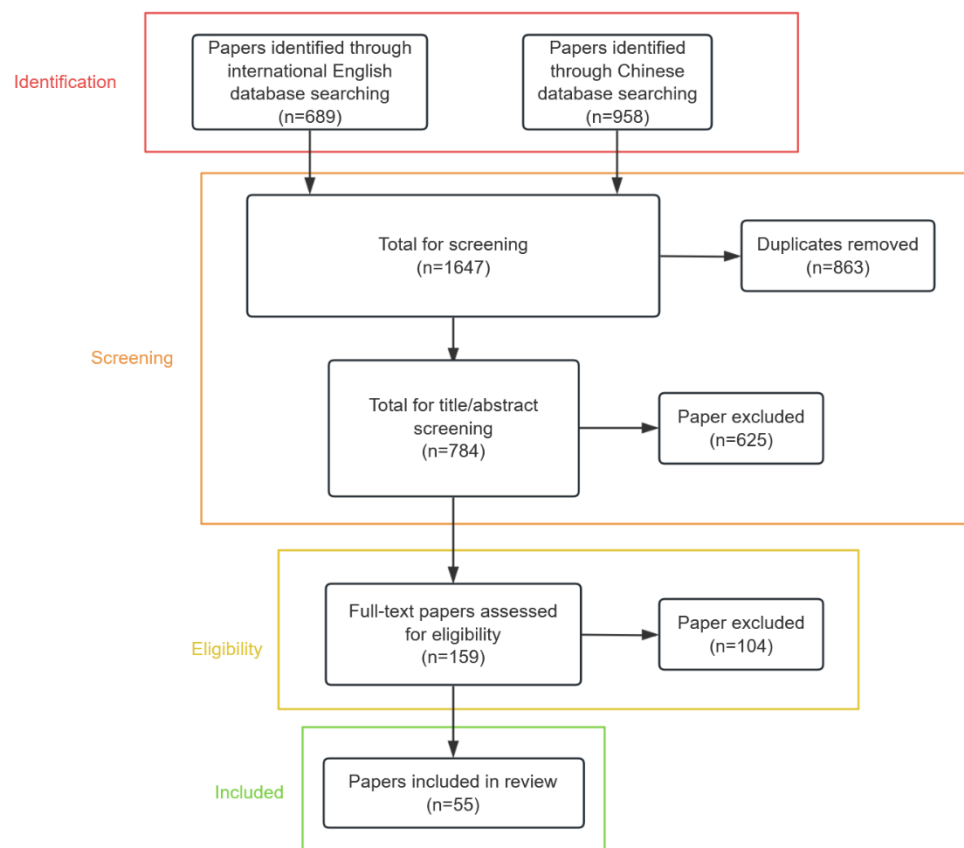


Figure 1 PRISMA flow diagram (Source: Page et al. (2021))

With regard to the extraction process, the current chapter adopted a search strategy and screening criteria informed by the analytical framework of Chen et al. (2020a). In their study, Chen et al. (2020a) conducted a systematic review of relevant literature published between January 2008 and September 2020, focusing on comparative analyses of public LTCL systems in four countries:

Germany, China, South Korea, and Japan. Their review examined four key dimensions: the institutional structures of public LTCI systems, their policy impacts, the challenges encountered during implementation, and the evolution of each system. The review process was guided by the PRISMA flow diagram and the Critical Appraisal Skills Programme (CASP).

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) reporting guidelines are intended to support researchers in providing transparent documentation of the rationale for conducting a systematic review, the methodology adopted, and the outcomes achieved. In line with this approach, the current chapter employed the PRISMA 2020 flow diagram to structure and present the screening process.

Following three rounds of screening (as presented in Table 1 and Figure 1), a total of 55 papers were included in the structured review, comprising 15 English-language and 40 Chinese-language academic articles. These publications were drawn from 42 academic journals, including 11 English-language and 31 Chinese-language journals. Full details of all included papers, including author names, publication years, titles, journal names, summaries, and language, are provided in Appendix 1.

3.3.2 Chronological Analysis

The origins of China's experimentation with LTCI can be traced back to Qingdao City in 2012, where it was initially introduced as the 'long-term care medical insurance system' (LTCMI) (An et al., 2017). This initiative emerged as a localised effort in the absence of formal policy guidance from the central government. It was not until June 2016 that the Ministry of Human Resources and Social Security of the People's Republic of China (2016) issued the *Guiding Opinions of the General Office of the Ministry of Human Resources and Social Security on Launching the Pilot Project of the Long-Term Care Insurance System* [2016] No.80, thereby formally initiating the national pilot phase of LTCI (as illustrated in the light blue areas in Figure 2).



Figure 2 China's long-term care insurance pilot regions

By September 2020, the National Healthcare Security Administration of China

and Ministry of Finance (2020) expanded the scope of the pilot policy (as shown in the dark blue areas in Figure 2). During this expansion period, the initial group of 15 pilot cities concluded their trial phases, producing valuable empirical evidence and practical insights. At the same time, a second group of 14 newly selected pilot cities commenced implementation. In addition to the first 15 cities designated in 2016, the central government also identified Shandong and Jilin provinces as ‘key pilot provinces’ (highlighted in Figure 2 with red borders), gradually incorporating 20 additional pilot cities prior to the release of the 2020 policy expansion document. As a result, following the 2020 expansion, a total of 49 pilot cities across 29 regions became operational (National Healthcare Security Administration of China, 2020). As shown in Figure 2, the spatial distribution of pilot policies demonstrates a gradual westward expansion from the eastern coastal regions.

Over the specified period, the publication timeline and volume of scholarly works appear to be closely aligned with key milestones in the development of China’s LTCI pilot policies. As illustrated in Figure 3, between June 2016 and October 2023, two distinct peaks in publication activity can be identified. The first peak occurred following the initial launch of the pilot policy in 2016, and the second followed the policy’s expansion in 2020. This pattern is evident across both Chinese- and English-language literature within the scope of the selected materials.

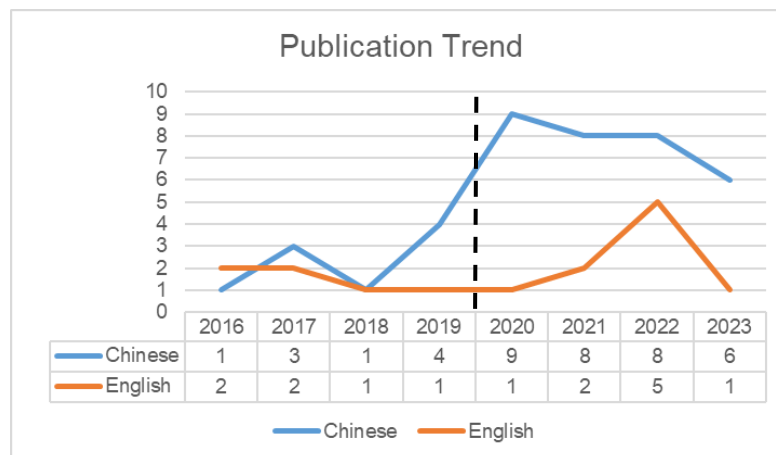


Figure 3 Publication trend of included papers (2016–2023)

The relatively limited number of research outputs during the early years of the pilot system’s implementation (2016–2019) can be attributed to the absence of formalised national policies prior to 2016. As a result, there was a general lack of available research data and information during this formative stage, which restricted scholarly engagement with China’s initial LTCI pilot policy and its designated pilot regions. Moreover, of the 40 articles published after 2020, 21 focus on the first batch of pilot cities, accounting for 52.5 per cent of the total. In contrast, only 7 studies specifically examine the newly designated 14 pilot cities or the full group of 29 pilot regions. The remaining publications are based on national-level analyses or focus on non-pilot areas.

This section argues that the observed delay in academic research publications can be explained through the concept of the ‘policy lag effect’ or ‘implementation lag effect’. Birkland (2015), in the chapter *Elements of the*

Policy-Making System, introduces the notion of the ‘policy process’, which refers to the transformation of policy ideas into formal enactments and their subsequent implementation. It is important to recognise that policy design is inherently linked to its implementation, much like the sequential stages of policy development (Birkland, 2015). Within the field of public policy implementation, a temporal gap often exists between the formulation of a policy and its operationalisation. This gap, commonly termed the implementation lag, is influenced by the complexity of the policy and the time and resources required for its effective execution.

Wilmoth (2010) argues that social institutions undergoing rapid demographic and societal change may struggle to respond promptly and effectively to the evolving needs of society and its members. The operational dynamics of such institutions often result in a disjuncture between institutional responses and the lived social ‘reality’ experienced by individuals within those systems (Riley and Riley Jr., 1994). Birkland (2015, p.331) in the chapter *Policy Implementation, Failure, and Learning*, illustrates this challenge by noting that “the process of translating vague legislative commands into rules and regulations can be among the most contentious and difficult activities in the entire policy process”.

Thus, applying the aforementioned theoretical framework to the formulation and implementation of China’s LTCI pilot policy, this section contends that following

the issuance of the pilot policy document by the relevant central government ministry, a period of adjustment is required for local governments and relevant agencies in each pilot city to interpret the policy, and to develop implementation protocols suited to their specific local contexts.

As a result, a temporal lag between policy implementation and its observable effects is to be expected. This lag helps explain the lack of immediate correlation between the timing of the policy's release and the publication of related academic research. The emergence of scholarly output is also dependent on the extent to which the policy begins to generate tangible outcomes in pilot cities, as well as on the accumulation of sufficient empirical evidence and data for meaningful analysis.

In summary, China's LTCI pilot programme expanded from Qingdao in 2012 to 49 cities across 29 regions by 2020, with a clear shift from east to west. Key policy directives in 2016 and 2020 shaped both implementation and research trends. The gap between policy rollout and academic output reflects an implementation lag, underscoring the need to consider policy dynamics when assessing research patterns.

3.3.3 Research Scope

China's LTCI policy has been implemented in two pilot phases: the initial phase

involving 15 pilot regions encompassing a total of 35 cities in 2016, followed by a second phase comprising 14 new pilot cities in 2020 (National Healthcare Security Administration of China, 2020). In this section, the selected literature is categorised into four distinct groups (as shown in Figure 4).

The categorisation of these groups corresponds to the official policy rollout phases of the LTCI pilot program, reflecting the studies' analytical focus rather than their publication wave. The first group, hereafter labelled 'first batch' in Figure 4, includes articles whose analysis is exclusively confined to the first batch of pilots. This encompasses studies of the entire cohort as well as those focusing on individual cities from this pilot batch. The second group labelled the 'second batch', comprises studies that extend their analysis to the pilot cities introduced in the 2020 phase. The third group, designated 'nationwide', includes articles whose scope explicitly covers the entirety of mainland China or implicitly addresses the LTCI system at a national level without a specific geographic focus. The final group, termed 'other', consists of studies focusing on cities outside the officially designated pilot regions.

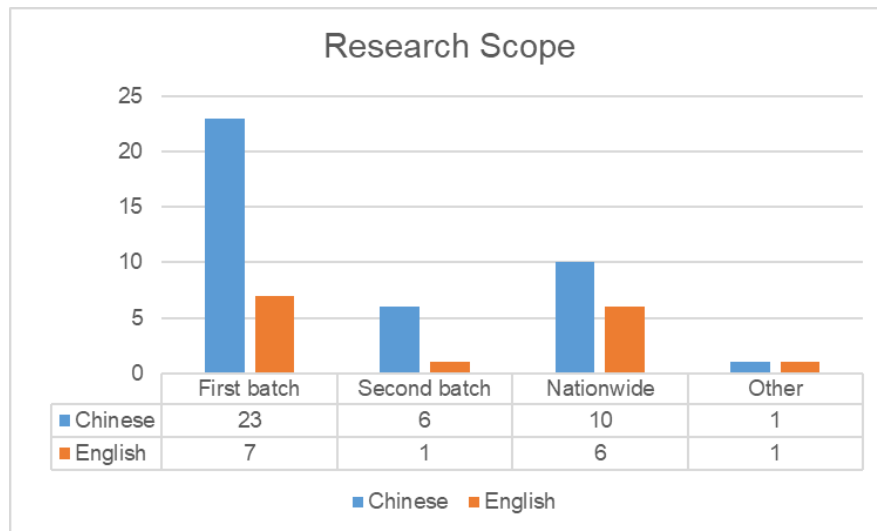


Figure 4 Research scope of included papers

The bar chart analysis reveals that, in research on financial sustainability, Chinese-language literature predominantly concentrates on the first batch of pilot cities, accounting for 23 articles (57 per cent). While English-language literature similarly covers the first batch (7 articles, 46 per cent), it also devotes comparable attention to the national level, with 6 articles (40 per cent) focusing on broader, non-localised analyses. This contrast in research focus is illustrated in Figure 5. A notable similarity across both Chinese and English sources is the limited attention given to the second batch of pilot cities and to non-pilot cities, with the latter represented by only two studies in total.

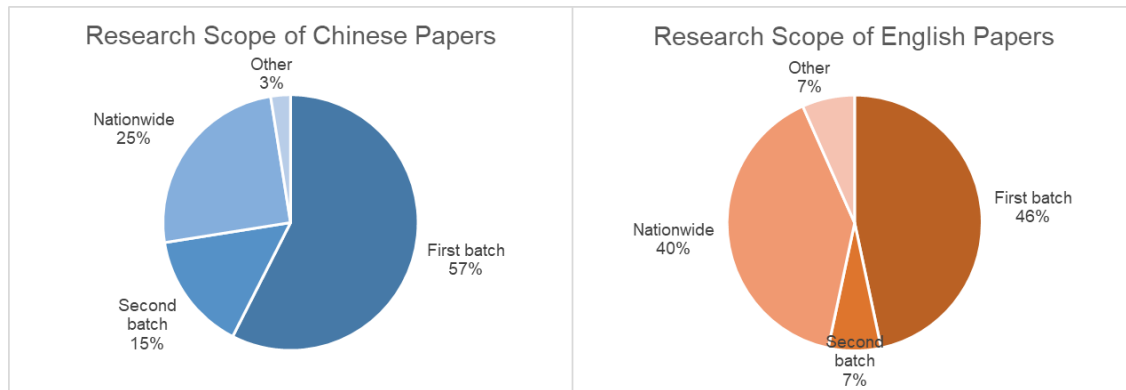


Figure 5 Distribution of research scope of included papers

The First Batch of Pilots

Among the 30 papers focusing on the first batch of pilot cities and regions in China, two main types can be identified based on their research subjects. The first type involves a comprehensive examination of all 15 pilot regions as a collective, while the second type consists of in-depth case studies of one or more selected pilot cities from the initial cohort.

To analyse the financial sustainability of the LTCI pilot policy, 11 articles (10 in Chinese and 1 in English) conducted an overall analysis of the first batch of 15 pilot regions. These studies share a common objective: to assess potential financial risks associated with nationwide implementation, based on the financing mechanisms outlined in the initial pilot policy document, and to propose corresponding coping strategies.

The qualitative studies employ comparative analysis and field interviews to

examine the financing arrangements of the pilot cities, focusing on financing channels, mechanisms, standards, contribution levels, and start-up capital (Zhou and Wang, 2019; Li and Ming, 2020; Li and Qian, 2023; He et al., 2019; Hai and Yin, 2020; Wu et al., 2018). Some also explore the interplay between LTCI policy, demographic ageing, and economic development from a policy-population-economy perspective (Song and Sun, 2020).

Quantitative studies primarily focus on assessing the financial deficit risks of implementing the current financing model nationwide (Chen et al., 2021a), estimating the affordability of existing contribution levels (Zhou and Zhang, 2022), and evaluating whether financing efficiency corresponds with regional economic development and demographic structure (Liu and Wang, 2020; Peng et al., 2022).

Among the 19 papers reviewed (13 in Chinese and 6 in English) that focused on specific pilot cities or provinces, a total of 10 locations were the primary subjects of study. Similar to the comprehensive analyses of the entire first batch of pilot regions, these 19 case studies employed both qualitative and quantitative methodologies to investigate funding sources, financing channels, contribution rates, and financing levels. In addition, several studies calculated the projected surplus rate of LTCI funds and assessed the risk of financial deficits to evaluate the overall balance of the LTCI fund. However, in contrast

to the broader analyses aimed at national policy implications, the findings and policy recommendations in these case studies are tailored to the specific cities or provinces under examination.

The cities and provinces analysed in these papers include Shangrao, Changchun, Nantong, Shanghai, Jingmen, Chengdu, Jiaxing, and Qingdao, as well as Anhui and Shandong provinces. Notably, Shanghai was the most extensively studied, appearing in seven papers, followed by Qingdao, which was examined in six. The distribution of the remaining studies shows no clear pattern of geographic concentration. This section argues that Shanghai and Qingdao possess distinctive characteristics that differentiate them from other cities in the first batch, rendering them of particular research interest.

Shanghai's LTCI pilot is distinguished by three key features: its coverage model, funding sources, and disability identification criteria. According to the *China Pilot Long-Term Care Insurance Policy Database (CLIP)*, the coverage models of LTCI pilot cities can be categorised into three groups: (1) Those covering only employees enrolled in the UEBMI; (2) Those covering both employees and residents enrolled in both UEBMI and the RBMI; and (3) Those targeting specific demographic groups. Shanghai falls into the third category, with

coverage restricted to individuals aged 60 and above¹⁴.

In terms of financing, analysis of official policy documents issued by pilot cities around 2016 and 2020 shows four general funding sources: employee contributions, employer contributions, fiscal subsidies, and other sources such as social donations and welfare lotteries. Shanghai's policy is notable for relying solely on appropriations from the UEBMI fund and employer contributions, without including individual contributions or fiscal subsidies¹⁵ (Guo, 2017; Li and Wei, 2017; Pan et al., 2021a). Moreover, Shanghai adopts a unique approach to disability assessment. Unlike most pilot cities, where assessment criteria tend to follow national guidelines, Shanghai employs a locally determined framework for evaluating levels of disability (Guo, 2017; Li and Wei, 2017; Pan et al., 2021a).

As one of the earliest cities to pilot LTCL, Qingdao has developed an integrated system that serves both urban and rural populations with disabilities and cognitive impairments, providing a combination of medical and daily living care services (Sun et al., 2020). Initially referred to as the 'long-term medical care insurance system' (An et al., 2017) or 'long-term care nursing insurance' (Chang et al., 2020), Qingdao's scheme has evolved through three successive

¹⁴ Notice of the General Office of the Shanghai Municipal People's Government on Issuing the 'Shanghai Long-Term Care Insurance Pilot Measures'. Hu Fu Ban Gui [2021] No.15

¹⁵ Notice of the General Office of the Shanghai Municipal People's Government on Issuing the 'Shanghai Long-Term Care Insurance Pilot Measures'. Hu Fu Ban Gui [2021] No.15

phases: the pre-pilot period, the initial pilot phase, and the expanded pilot phase. This extensive implementation experience offers valuable insights that may inform policy design in other cities, regions, and even countries (Sun et al., 2020; Yang et al., 2021a).

Among the six academic papers focused on Qingdao, three are written in Chinese and three in English. The Chinese literature primarily adopts a comparative analytical approach to examine the nature, sources, levels, and equity of Qingdao's LTCI financing scheme (Deng and Deng, 2017). In addition, quantitative modelling is employed to forecast the future cash flow of the LTCI fund under the Qingdao model (Sun et al., 2020; Yang, 2019). In contrast, the English-language literature focuses on the financial sustainability, equity in financing, and coverage efficiency of the Qingdao model (Lu et al., 2017a; Yang et al., 2021a; Yang et al., 2016).

A more detailed analysis of these pilot cities will be presented in the Chapter Six, which is dedicated to a structured comparative policy review of pilot policy documents.

The Second Batch of Pilots

Among the 55 academic sources reviewed in both Chinese and English, only seven papers (six in Chinese and one in English) focus on the 14 new pilot

cities included in China's LTCI expansion policy announced in 2020. These studies can be grouped into three categories: (1) Those examining all 29 pilot cities across both the first and second batches; (2) Those concentrating exclusively on the second batch of 14 pilot cities; and (3) Those conducting case studies on selected cities from the second batch.

The first category comprises research that analyses all 29 pilot regions, primarily drawing on policy analysis and implementation experience. These studies explore the evolution of LTCI across various cities (Chen, 2023b; Du and Wang, 2022a) and provide long-term financial projections, such as anticipated budget surpluses and deficits over a 30-year horizon (Zhu and Ma, 2023). The second category contains a single study focused exclusively on the 14 newly added pilot cities. Zhang and Zhang (2022) argue that while the second batch of cities has introduced improvements to the LTCI financing mechanism, key elements such as financing standards, funding channels, and subsidy arrangements remain under discussion.

The third category includes case studies of specific cities within the second batch, such as Qiqihar, Changchun, Tonghua, and Panjin in Northeast China, as well as Beijing, Tianjin, Kaifeng, Hangzhou, Xiangtan, Nanning, and Fuzhou in Central and Eastern China. These studies aim to offer a theoretical foundation for the eventual nationwide implementation of LTCI.

Methodologically, they adopt two main approaches: semi-structured interviews focusing on five key dimensions (allocation base, type of provision, delivery strategy, financing model, and external environment) (Han and Shen, 2022); and quantitative assessments estimating the scale of the disabled older population and projected LTCI expenditures (Yang et al., 2023; Zhu et al., 2023).

While both the seven papers on the second batch of pilot cities and the 30 papers on the first batch focus on research related to pilot batches, their emphases differ. Studies on the first batch primarily seek to assess the strengths and weaknesses of specific pilot models and to propose reform strategies adapted to local contexts. In contrast, research on the second batch extends beyond local-level analysis to consider how the strengths of the pilot model can be preserved and its limitations addressed in the context of national-scale implementation. This shift reflects a movement from case-specific evaluations towards the formulation of general principles, aimed at ensuring that China's LTCI system remains both financially sustainable and broadly affordable.

Nationwide

A total of 16 studies (six in English and ten in Chinese) adopt a macro-level perspective, treating mainland China as the primary unit of analysis. These studies focus on the financial sustainability of the LTCI pilot system from four

key perspectives: contribution rate and individual affordability, cost projection, funding level and payer affordability, and policy design and financing mechanism.

First, the Chinese-language papers categorised under the ‘nationwide’ group primarily examine the financial sustainability of the LTCI system from four analytical perspectives: contribution rate and individual affordability, cost projection, funding level and payer affordability, and policy design and financing mechanisms. Of the ten Chinese studies, only one adopts a qualitative approach. Wen and Kong (2020) analyse China’s LTC financing and the transformation of public finance from both supply-side and demand-side perspectives, drawing on the concept of the enabling state. Originally proposed in Western policy discourse, the enabling state framework offers a lens through which to rethink public service provision, advocating the application of market principles to enhance efficiency and innovation (Deakin and Walsh, 2007).

The remaining nine Chinese papers adopt quantitative methodologies, focusing primarily on projections of future LTCI fund demand (Chen and Shi, 2021), estimations of contribution rates (Li, 2020a; Lin, 2016; Tang and Su, 2021; Wang et al., 2021), and assessments of the financial pressure borne by LTCI payers (Chen, 2022; Tian, 2020; Zhang, 2020; Tang et al., 2022a). These payers are generally categorised as individuals, employers, government

budgets, and basic medical insurance funds.

Second, the English-language papers within the 'nationwide' group are all quantitative in nature and primarily analyse the financial sustainability of the LTCI system from two perspectives: contribution rate and individual affordability, and cost projection. Specifically, Jin et al. (2023), Li and Otani (2018), Lu et al. (2017b), and Xu and Chen (2019) focus on forecasting the future costs and expenditures of China's LTCI. Their analyses examine the effects of rising care costs, the relationship between LTC expenditure and GDP, the influence of education and urbanisation on public LTCI spending, and cost variations associated with differing levels of disability among older individuals.

In contrast, Lei et al. (2016) and Zhang et al. (2020b) focus on estimating the contribution rate required to support LTCI coverage for disabled individuals aged 65 and over. Their work pays particular attention to disparities in social security entitlements across different population groups, highlighting issues of equity in service availability and affordability.

Although all 16 selected studies adopt mainland China as the unit of analysis in exploring the financial sustainability of LTCI, there are notable similarities and differences in emphasis between the Chinese and English literature. Both bodies of work examine contribution rates and individual affordability, as well

as cost projections. However, the Chinese literature uniquely explores aspects of policy design and the financing mechanisms underpinning China's LTCI pilot policy, which are not addressed in the English-language studies.

In addition, Chinese research adopts both micro-level and macro-level perspectives, assessing not only individual affordability but also the financial capacity of other LTCI funding sources such as employers, basic medical insurance funds, and government fiscal subsidies. In contrast, the English literature focuses primarily on individual affordability from a microeconomic perspective, with limited consideration of broader systemic financing entities.

Other: Non-pilot Cities

Among the 55 articles included in the structured review, only two focus on non-pilot cities (one published in Chinese and the other in English). The Chinese article analyses Zhengzhou City in Henan Province (Zhang and Yang, 2019), while the English article examines Xiamen City in Fujian Province (Zhang et al., 2021). Although Henan Province and Fujian Province are among the second batch of pilot regions, the officially designated pilot cities are Kaifeng and Fuzhou, respectively, rather than Zhengzhou and Xiamen. Despite not being included in the official list of pilot cities, certain local governments have taken proactive steps to implement LTCI schemes tailored to local needs. These efforts have led to the development of distinctive institutional models, which

offer valuable insights and merit academic investigation.

Zhang and Yang (2019) highlight that, according to central government directives and insights from other pilot cities, China's LTCI system is overly reliant on basic medical insurance, with funding primarily drawn from medical insurance fund transfers. This dependency compromises the autonomy of the LTCI system. In response, the study investigates the 'Zhengzhou model', which entirely excludes basic medical insurance funds from LTCI financing. The findings suggest that under this model, personal contributions remain affordable, fiscal subsidies are sustainable, and the financing framework is stable in the long term (Zhang and Yang, 2019).

Xiamen, another non-pilot city, is a major urban centre on China's southeast coast and one of the country's original four special economic zones. Its distinct status makes it a valuable subject for investigation. Zhang et al. (2021) project future LTCI revenues and expenditures under the 'Xiamen model', concluding that the LTCI fund would enter a deficit after 2029. Without adjustments to individual contributions, government subsidies, and employer inputs, the model would become financially unsustainable (Zhang et al., 2021).

Given China's vast geographical and administrative diversity, many cities outside the 49 officially designated pilot cities have independently introduced

LTCl schemes. This has contributed to a degree of decentralisation and fragmentation in system implementation (Zhou and Dai, 2021). Zhou and Dai (2021) identify numerous inconsistencies across local LTCl policies, resulting in marked disparities in beneficiary services, funding sources, benefit levels, service provision, and inter-agency coordination. These issues underscore the continuing need for substantial reform of the LTCl system at both national and local levels.

In conclusion, the 55 selected papers were categorised into four groups: first batch, second batch, nationwide, and other. Chinese studies mainly focus on the initial pilot cities, while English literature tends to adopt a national perspective. Research on the second batch and non-pilot cities remains limited. This structured review highlights how diverse research scopes offer complementary insights and help identify gaps in understanding the fiscal sustainability of China's LTCl system.

3.3.4 Research Perspective

Based on differing analytical perspectives, the 55 selected academic papers were categorised into six groups: (1) contribution rate and individual affordability; (2) cost projection; (3) financing efficiency; (4) fund balance and impact factors; (5) funding level and payer affordability; and (6) policy design and financing mechanisms. As shown in Figure 6, the review reveals that the

most frequently examined theme was policy design and financing mechanisms, addressed in 15 papers. This was followed by funding level and payer affordability, and contribution rate and individual affordability, each covered in 10 papers. In contrast, fewer studies focused on cost projection and fund balance and impact factors. The least explored perspective was financing efficiency, which received minimal attention in the reviewed literature.

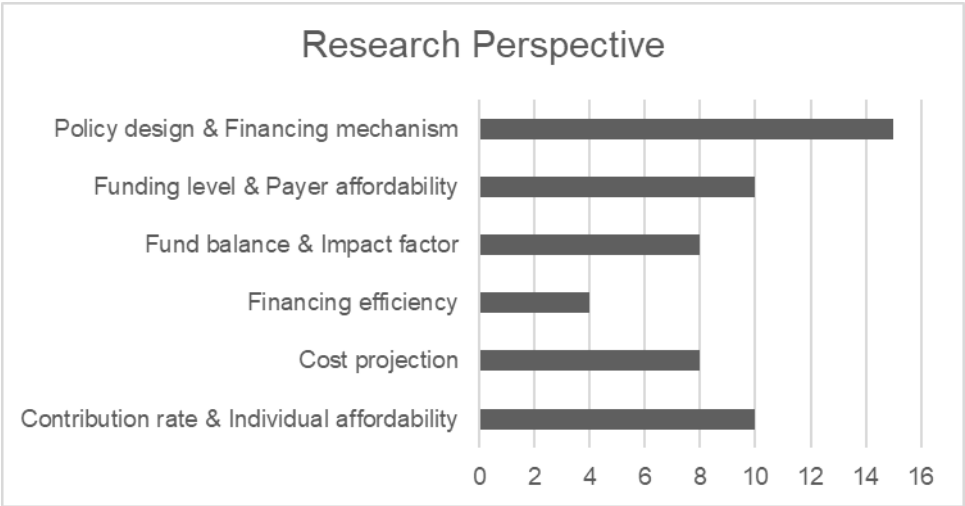


Figure 6 Research perspectives of included papers

The distribution of research perspectives across Chinese and English literature is illustrated in Figure 7. Notable differences emerge in how financial sustainability in China’s LTCI system is approached in each language. A key distinction is the absence of studies on funding level and payer affordability in the selected English-language materials. Thematically, Chinese literature primarily addresses financial sustainability through policy design and financing mechanisms, with secondary emphasis on funding level and payer affordability.

In contrast, English-language studies focus predominantly on cost projection, followed by fund balance and impact factors.

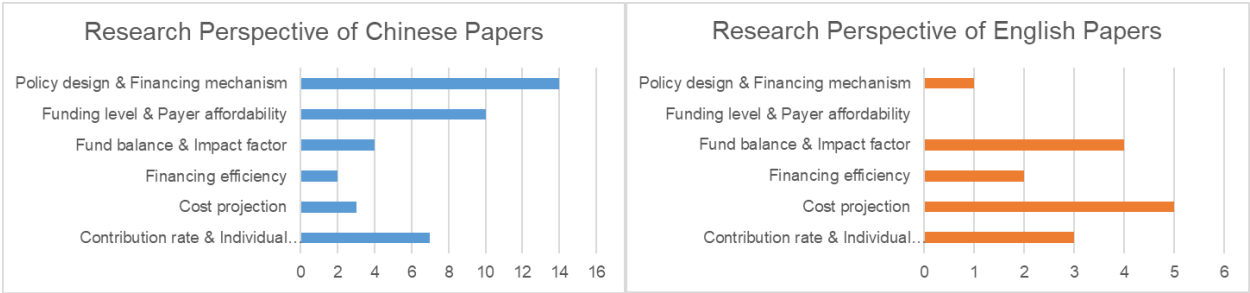


Figure 7 Research perspectives of included Chinese and English papers

The following sections will present a comprehensive analysis of research findings from each of these six perspectives.

Policy Design & Financing Mechanism

“A country’s LTC services are financed by a mix of funding sources: taxes, compulsory insurance, voluntary insurance, out-of-pocket (OOP) payment, and donations” (Luk et al., 2022, p.7).

In line with the principle of “determining expenditures based on revenues, maintaining a balance between revenues and expenditures, and ensuring a slight surplus in the fund” (Ministry of Human Resources and Social Security of the People’s Republic of China, 2016, p.1), various pilot regions in China have established financing mechanisms adapted to their local economic and social development levels (Wu et al., 2018). These regions have developed initial LTCI

financing models that primarily rely on transfers from basic medical insurance funds, supplemented by fiscal subsidies and joint contributions from individuals and employers (He et al., 2019).

Owing to the absence of a unified LTCl framework in China, pilot regions have implemented diverse LTC schemes, leading to significant variation in policy design across multiple dimensions (Zhou and Dai, 2021). These differences are particularly evident in financing policies, with cities displaying considerable variation in fund-raising strategies and benefit payment structures (Zhou and Wang, 2019). As fund-raising mechanisms and benefit distribution are central to the financial sustainability and equity of the LTCl system, policy design and financing mechanisms have become focal points of academic and policy interest (Zhou and Wang, 2019).

The 'Policy Design and Financing Mechanism' category comprises 14 Chinese papers and one English paper. These 15 studies adopt a broadly similar policy analysis framework, examining five key dimensions: insured populations, financing sources, financing channels, financing methods, and financing standards. The conclusions across these studies are notably consistent. From the introduction of the first phase of the pilot policy in 2016 to the release of the second phase in 2020, the objectives of the pilot schemes have become more clearly defined, their functions more comprehensive, and overall policy

transparency has improved (Chen, 2023b). Furthermore, the pilot programmes have produced initial positive outcomes, including the provision of various care services for disabled older adults, a reduction in their financial pressure, and the stimulation of growth in the care service industry (Li and Wei, 2017).

However, several challenges remain unresolved. There is broad consensus within the academic community that China's LTCI financing mechanism remains underdeveloped and lacks standardisation. This is particularly evident in four key areas:

First, the financing structure is overly narrow, relying primarily on contributions from employees and employers, supplemented by fiscal subsidies and transfers from the basic medical insurance fund (Zhang and Zhang, 2022; Deng and Deng, 2017; Hai and Yin, 2020).

Second, there are significant regional disparities in financing standards. For instance, among the first batch of pilot cities, Anqing sets its financing standard at RMB 30 per person per year, while Chongqing sets it at RMB 150 (a fivefold difference) (Zhou and Wang, 2019). These discrepancies reflect underlying variations in local economic development and the balance of basic medical insurance funds, and they contribute to unequal benefit payments. Such inconsistencies raise concerns about the long-term financial sustainability of

the LTCl system (Zhou and Wang, 2019; Wu et al., 2018; Li and Qian, 2023; Chen, 2023b).

Third, there is excessive reliance on basic medical insurance funds. While this approach enables the smooth rollout of LTCl without increasing the financial pressure on insured individuals (Zhou and Wang, 2019), it fails to provide a sustainable funding source for LTCl in the long term (Li and Ming, 2020; Han and Shen, 2022). Although the basic medical insurance fund currently operates at a surplus, pressures from population ageing are mounting. The reliance on this fund is increasingly problematic, particularly in regions where the medical insurance fund is limited or in deficit, making it difficult to allocate additional resources for LTCl (Li and Qian, 2023).

Fourth, the system lacks effective incentive mechanisms. As Deng and Deng (2017) point out, LTCl funds are typically drawn from basic medical insurance accounts or government fiscal subsidies. From the individual's perspective, this results in a low sense of ownership and participation, thereby reducing the motivation of various social actors to engage with or support the system (Deng and Deng, 2017).

Funding Level and Payer Affordability

The implementation of China's LTCl pilot programme represents a vital step in

addressing the challenges of an ageing population and in closing the gap in institutional protection against disability risks. Ensuring a stable and equitable funding structure is essential for the sustainability of LTCI, as contribution rates directly influence both the financial pressure on contributors and their willingness to participate (Chen, 2022). Research in this category focuses on the affordability of LTCI for various funding entities, assessing financial pressure under different financing scenarios. Four types of payers are analysed: government finances, the basic medical insurance fund, individuals, and employers. Notably, all selected studies are published in Chinese, with no English-language papers included. Compared to the 'Contribution Rate and Individual Affordability' category, the findings suggest that English literature tends to prioritise micro-level analysis, particularly individual affordability, while Chinese studies also explore macro-level financing challenges.

Regarding employers, Chen (2022) projects LTCI financing pressure between 2020 and 2050. Findings suggest that while government and individual contributions are manageable, employers may experience substantial financial pressure. Over this period, the fiscal subsidy rate is estimated to increase from 0.031 per thousand to 0.084 per thousand, with employer contributions ranging from 0.52 per cent to 3.08 per cent, and individual contributions from 0.38 per cent to 2.26 per cent (Chen, 2022).

With respect to government finances, Li (2020a) finds that most pilot cities' LTCI plans are fiscally viable by 2050, except for Shanghai. However, Tang et al. (2022a) warn that expanding LTCI coverage to include all degrees of disability could significantly increase government expenditure as a share of GDP, threatening sustainability. Yu (2021), using Shandong Province as an example, observes that although government contributions remain modest, they still impose fiscal strain. In many Shandong cities, fiscal subsidies account for approximately 20 per cent of LTCI financing, equating to tens or even hundreds of millions of RMB annually and potentially affecting other areas of social welfare provision.

For the basic medical insurance fund, Tang et al. (2022a) argue that including all older people with disabilities could place unsustainable pressure on the fund. Tian (2020) highlights that LTCI financed through the RBMI is more sustainable than through the UEBMI. Disparities across regions are evident; for example, Qingdao faces a widening deficit in its medical insurance fund, raising concerns about its capacity to support LTCI without compromising core medical insurance functions (Yang, 2019).

Finally, several scholars propose alternative financing schemes to ensure affordability. Guo (2017) advocates a 1:1 cost-sharing model between individuals and employers, supplemented by government subsidies. Wan (2023)

suggests three cost-sharing arrangements between government, employers, and individuals, with ratios ranging from equal distribution to greater individual responsibility. Zhang (2020) and Zhu and Ma (2023) conclude that an optimal model should balance broad coverage with modest benefit levels to ensure affordability for all parties, thereby promoting universal participation and sustained contributions.

Fund Balance and Impact Factor

To meet the growing LTC needs of China's disabled older population, the LTCI system was introduced in 2016 as part of the broader social security framework. It aims to mobilise multiple social entities to jointly contribute to a fund that supports essential daily living and medical services for individuals with long-term disabilities (Chen et al., 2021a). The financial sustainability of this system is crucial to its continued operation, with the balance between revenue and expenditure, as well as potential surpluses or deficits, emerging as key concerns (Chen and Zhao, 2021).

This category includes eight academic studies, equally divided between Chinese and English-language sources, which focus on two core aspects: (1) Projections of future revenue and expenditure trends in LTCI funds; and (2) The factors influencing the financial balance of these funds.

First, Chen and Zhao (2021), Chen et al. (2021a), and Pan et al. (2021a) assess projected deficits under various financing and benefit assumptions. While Chen and Zhao (2021) focus on Shangrao City and Chen et al. (2021a) examine the first batch of 15 pilot cities, both studies conclude that LTCI funds can maintain a surplus only if financing levels and benefit levels remain constant or change in tandem. Any mismatch in growth trends increases the risk of financial deficit. In contrast, Pan et al. (2021a) analyse Shanghai's LTCI fund and project a surplus from 2020 to 2033, followed by potential imbalances from 2034 to 2050. They recommend that contribution rates be determined through actuarial assessments by social security authorities, and that insurance premium collection remain the primary funding source. Furthermore, care services should be strictly regulated, with any services outside the defined scope to be paid out-of-pocket by individuals.

Second, regarding factors affecting fund balance, the selected studies examine a diverse range of cities, including Qingdao (Lu et al., 2017a), 14 second-batch pilot cities (Peng et al., 2022), Xiamen (a non-pilot city) (Zhang et al., 2021), and first-batch cities such as Jiaxing, Shanghai, Jingmen, and Chengdu (Zhang et al., 2022a; Zhang et al., 2022b). Despite methodological differences, these studies converge in identifying key drivers of fund sustainability. These include individual contribution rates, government subsidies, employer contributions, care service reimbursement levels, rates of severe disability, UEBMI enrolment

levels, and individual willingness to seek care (Zhang et al., 2021; Zhang et al., 2022b; Zhang et al., 2022a; Peng et al., 2022).

Notably, Lu et al. (2017a) introduce mortality as a novel variable. In their analysis of Qingdao's LTCMI system, they find that the average age of beneficiaries significantly affects system costs, as higher mortality rates may lead to reduced per capita expenditures or allow more beneficiaries to be served with the same funding. They suggest that applying age-based eligibility restrictions, such as limiting access to older age groups, may help control overall programme costs (Lu et al., 2017a).

Financing Efficiency

Among the 55 selected studies, only four (two in Chinese and two in English) address the financial sustainability of China's LTCI system from the perspective of financing efficiency. The two Chinese-language papers adopt quantitative methods using the Data Envelopment Analysis (DEA) model (Li and Guo, 2021; Liu and Wang, 2020), while the English-language papers employ qualitative approaches, including in-depth interviews (Yang et al., 2021a) and comparative analysis of academic and grey literature (Yang et al., 2016). The methodologies used in these studies are discussed in detail in Methodological Preference section.

Li and Guo (2021) examine 12 pilot cities in Shandong Province, revealing significant variation in financing levels and generally low operational efficiency. Similarly, Liu and Wang (2020), in their assessment of 14 pilot cities from the first batch, report substantial disparities in financing efficiency and a misalignment between financing performance, local economic development, and demographic structure. Using qualitative data from 47 in-depth interviews conducted in 2016, Yang et al. (2021a) assess Qingdao's LTCI system and identify inequities in the financial pressure among insured individuals, as well as poor overall financing efficiency. In a separate study, Yang et al. (2016) compare three LTCI financing models (Shanghai, Qingdao, and Nanjing) and conclude that Qingdao's model is the most effective in terms of structure and outcomes. However, they note that Qingdao's stringent eligibility criteria exclude a considerable number of older adults in need of care, underscoring the need for future policy reform (Yang et al., 2016).

In summary, although these Chinese and English studies adopt different research subjects and methodologies, they converge on a common conclusion: the financing efficiency and equity of China's LTCI system remain insufficient. To address these challenges, the studies recommend enhancing macro- and provincial-level design, establishing a unified financing mechanism, and improving the operational efficiency of LTCI funds (Liu and Wang, 2020; Li and Guo, 2021; Yang et al., 2021a; Yang et al., 2016).

Cost Projection

As illustrated in Figure 7, cost projection constitutes a primary focus of the English-language literature on the financial sustainability of China's LTCI system. Among the eight papers categorised under this theme, five are in English (62.5 per cent) and three in Chinese.

Two main analytical approaches are evident in the cost projection literature. The first involves estimating the overall scale of fund demand. This begins with projections of the disabled older population in China over the coming decades, followed by estimates of LTCI expenditure based on anticipated LTC needs (Chen and Shi, 2021; Li and Otani, 2018; Xu and Chen, 2019). The second approach constructs multiple cost scenarios, which are typically based on varying assumptions about disability rates or public expenditure levels, and then assesses the projected pressure of LTCI costs in relation to GDP (Guo and Li, 2022; Jin et al., 2023; Lu et al., 2017b; Sun et al., 2020). Notably, no significant differences in methodological preference between Chinese and English literature are observed.

Within the first sub-group, which focuses on fund demand, four papers (two in Chinese and two in English) forecast the scale of China's disabled older population. Chen and Shi (2021), Li and Otani (2018), and Yang et al. (2023)

estimate figures for 2030, while Xu and Chen (2019) extend projections to 2050. Although results vary due to differences in data sources and assumptions, all studies predict a clear upward trend. The mildly disabled are expected to represent the largest group, while the most rapid growth is anticipated among those with severe disabilities. Yang et al. (2023) project a 5 to 7 per cent rise in the severely disabled population between 2021 and 2030, while Chen and Shi (2021) estimate an average annual growth rate of 6.5 per cent. Based on these forecasts, Li and Otani (2018) project that the costs of LTC will double by 2030. Xu and Chen (2019) predict that, by 2050, median LTC expenditures for mild, moderate, and severe disability will reach \$141.7 billion, \$32.28 billion, and \$72.78 billion respectively.

In contrast, the second sub-group, focused on LTCI cost projections as a proportion of GDP, includes both national-level and city-level analyses. Lu et al. (2017b), for example, assess national-level LTCI costs under three GDP transfer scenarios (low, medium, and high). In the high scenario, one-third of per capita GDP is allocated to LTC for both ADL and IADL disabled individuals. Under this condition, LTCI expenditure could reach 1.40 per cent of GDP by 2050. Lower benefit levels reduce this figure to 1.05 per cent (Lu et al., 2017b).

At the city level, Sun et al. (2020) model Qingdao's LTCI costs under varying disability rates. Their findings suggest that under a low disability scenario, LTCI

expenditure as a share of Qingdao's GDP will increase from 0.04 per cent in 2018 to 0.37 per cent in 2050. In the high disability scenario, this share is projected to rise from 0.11 per cent to 0.85 per cent over the same period. Similarly, Jin et al. (2023) examine LTC costs under home and community-based service models, projecting an increase from 0.3 per cent of GDP in 2005 to 0.7 per cent in 2020, and further to 6.4 per cent by 2050.

Contribution Rate and Individual Affordability

China's overall LTCI contribution rate is projected to rise significantly, increasing from 1.46 per cent in 2020 to 5.14 per cent in 2050, an approximate 3.5-fold growth (Zhang et al., 2020b). Given the already substantial pressure of social security contributions, a key challenge in establishing a sustainable LTCI system lies in avoiding further increases to this financial pressure (Lin, 2016).

As shown in Figure 7, 'Contribution rate & Individual affordability' ranks as the third most frequently addressed topic in both Chinese and English literature. A total of ten papers (seven in Chinese and three in English) fall into this category. These studies assess projected LTCI contribution rates and explore individual affordability from four dimensions: disparities among disabled older groups (Lei et al., 2016), variations among different population segments (Ma and Zhang, 2022b; Ma et al., 2022; Zhu et al., 2023; Lin, 2016; Yang et al., 2022), urban-rural differences (Wang et al., 2021; Zhang et al., 2020b), and differences in

financing approaches (Zhou and Zhang, 2022; Tang and Su, 2021).

Lei et al. (2016) investigate the affordability and accessibility of LTC services for individuals aged 65 and over with disabilities, with particular emphasis on disparities in access to social security benefits. Their findings show that disabled older adults without any social security entitlements are 18.45 times more likely to be unable to afford care-related medical expenses than those with comprehensive coverage (Lei et al., 2016).

In relation to differences among contributor groups, current contribution rates appear to be reasonable and affordable for individuals. Using nationwide data, Lin (2016) projects annual LTCI contribution rates from 2014 to 2050. If only urban employees contribute, the rate is expected to exceed 1 per cent by 2033, rise above 1.5 per cent by 2048, and reach approximately 1.61 per cent by 2050. However, if the contributing group is expanded to include retired employees and urban and rural residents over the age of 25, the projected rates are more moderate, surpassing 0.5 per cent around 2031, 0.75 per cent by 2044, and reaching 0.88 per cent by 2050 (Lin, 2016).

At the provincial level, Ma and Zhang (2022b) and Ma et al. (2022) assess the contribution rate in Anhui Province, finding that the total rate for participants under the UEBMI system is 2 per cent. The monthly cost of care for disabled

individuals ranges from RMB 1,445 to 3,705, depending on the severity of disability. According to the 2020 Anhui Statistical Yearbook, the average annual income of urban employees is RMB 65,436, approximately RMB 40,000 higher than that of urban and rural residents. Therefore, any LTCI scheme implemented in Anhui must account for disparities in disability-related costs, employment income levels, and related factors when setting appropriate contribution rates (Ma et al., 2022; Ma and Zhang, 2022b).

In Nanning, Zhu et al. (2023) estimate the employee contribution rate to be 0.17 per cent, which is considered reasonable. The overall ratio of social security contributions remains well below individuals' maximum tolerance levels, suggesting that LTCI premiums for urban employees are currently affordable (Zhu et al., 2023). Likewise, Yang et al. (2022) report that the contribution rate in Shandong Province was 0.23 per cent in 2020, and is projected to rise to between 0.24 per cent and 0.31 per cent by 2025, a range still deemed feasible.

However, when urban-rural differences are considered, the affordability of LTCI becomes more problematic. Zhang et al. (2020b) forecast that the total LTCI funding demand will rise from RMB 538 billion in 2020 to 8,530.8 billion by 2050, with urban areas accounting for over 80 per cent of this demand. Per capita funding requirements for LTC are projected to increase by approximately six times in urban areas and eleven times in rural areas, relative to 2020 figures.

As a result, the financial pressure on rural residents will rise significantly, and the contribution rate is expected to follow a linear upward trend, leading to increased annual payment obligations (Zhang et al., 2020b). Similarly, Wang et al. (2021) calculate that rural residents may need to contribute 3.05 per cent, 5.92 per cent, or 8.81 per cent of their income base, depending on the level of care required. These figures indicate a potentially substantial financial strain on individuals in rural areas, further highlighting the need to consider regional and demographic factors when designing equitable and sustainable LTCI contribution models (Wang et al., 2021).

This section reviewed 55 academic studies from six analytical perspectives. Chinese literature mainly focuses on policy design and financing mechanisms, while English studies emphasise cost projection and micro-level affordability. Notably, funding level and payer affordability is absent in the English materials. The divergence in conclusions across similar themes highlights the importance of multi-dimensional analysis in evaluating the financial sustainability of China's LTCI system. The next section discusses methodological preferences.

3.3.5 Methodological Preference

Among the 55 Chinese and English academic sources included in the structured review, scholars adopted a variety of methodological approaches to examine the financial sustainability of China's LTCI system. As illustrated in

Figure 8, quantitative research predominates, accounting for 65 per cent of the studies, followed by qualitative research at 29 per cent, with mixed-method approaches representing only 6 per cent.

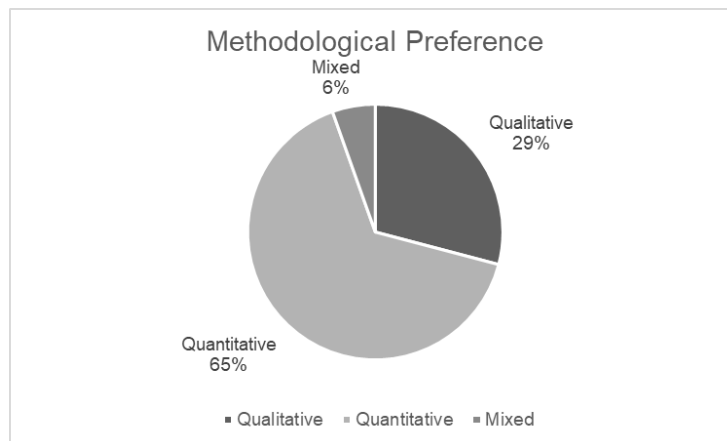


Figure 8 Methodological preference of included papers

Figure 9 presents the distribution of the three types of research methodologies in both Chinese and English literature. It is evident that quantitative methods are predominantly employed in analyses of the financial sustainability of China's LTCI policy, accounting for 65 per cent of Chinese and 67 per cent of English studies. A notable difference, however, lies in the use of qualitative and mixed methods. In Chinese literature, qualitative research is utilised more than ten times as often as mixed methods. By contrast, in English literature, the proportions of studies employing qualitative and mixed methods are relatively similar, at 20 per cent and 13 per cent, respectively.

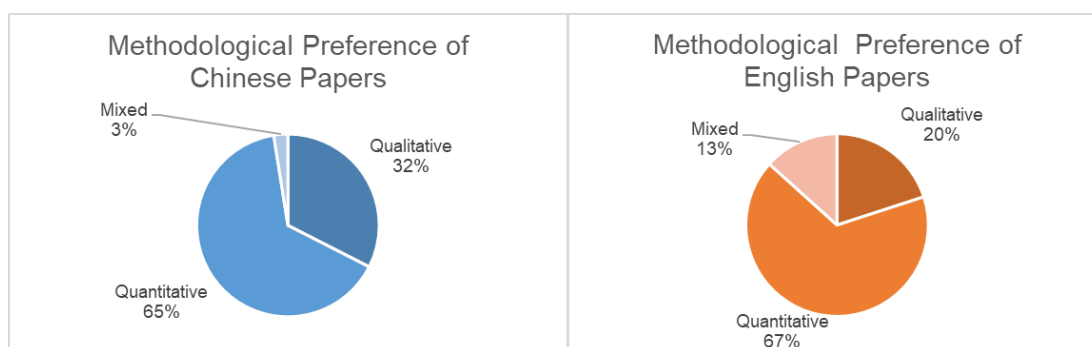


Figure 9 Methodological preference of included Chinese and English papers

This section will discuss the research methodologies of the selected academic materials from three dimensions: sources of data, employed methods or models, and analytical frameworks or variables.

Qualitative Research

This section summarises the sources of research materials, research methods, and analytical frameworks used in the qualitative studies among the selected papers (see Table 2). Three key findings emerge:

First, qualitative research primarily draws upon three types of source materials: academic literature, policy documents, and interview transcripts. Notably, local government policy documents from pilot cities constitute the dominant source, appearing in 75 per cent of the studies (12 articles), followed by interview data and literature, each accounting for 12.5 per cent.

Second, in terms of methodological approaches, scholars selected methods

largely based on their data sources. Comparative analysis was the most frequently employed technique (8 articles), followed by case studies (3 articles), policy evaluation and literature review (2 articles each), with interviews being the least utilised.

Third, regarding analytical frameworks, considerable thematic overlap exists across the 16 studies. The key dimensions identified include: nature of funding, sources of financing, funding levels, equity in fundraising, insured populations, financing channels, forms and standards of financing, fund management, beneficiary eligibility, benefit levels and scope, payment mechanisms, contribution ratios, premium structures, funding bases, financial models, policy frameworks, supply mechanisms, demand-side factors, supply-side conditions, arrangements for specific groups, socio-cultural contexts, and human resources.

“To theorise in an inductive direction, we begin with observing the empirical world and then reflecting on what is taking place and thinking in increasingly more abstract ways” (Neuman, 2013, p.70).

In line with Neuman (2013) observation, the present section argues that an inductive analytical approach predominates in studies examining the financial sustainability of China’s LTCI system. Drawing on the aforementioned three

findings (Sections 3.3.2 to 3.3.4) and a comprehensive review of the full texts of the selected papers, this chapter identifies a shared objective among these studies: to evaluate the financial sustainability of China's LTCI pilot programme. While the studies vary in scope and analytical perspective, their methodological trajectory is broadly similar. Researchers employing qualitative methods progressively developed a clearer and more comprehensive understanding of the LTCI financing framework by systematically reviewing and analysing policy documents and academic literature, and in some cases conducting field visits and interviews. These empirical insights were then synthesised and abstracted, ultimately producing theoretical insights and policy recommendations.

Table 2 Overview of qualitative research approaches in selected LTCI studies

Author	Data source	Method	Framework
(Deng and Deng, 2017)	Policy documents issued by local governments of pilot cities	Comparative research method	Fundraising nature, financing source, financing level, fundraising fairness
(Du and Wang, 2022a)	Policy documents issued by local governments of pilot cities	Comparative research method	Insured subject, financing channel, contribution ratio, financing approach, financing arrangements for specific groups
(Hai and Yin, 2020)	Policy documents issued by local governments of pilot cities	Comparative research method	Insured subject, financing channel, financing form, financing standard, startup capital
(Han and Shen, 2022)	Used purposive sampling to recruit 10 beneficiaries and providers of LTCI in nursing homes of different kinds, as well as 2 operators (Medical Insurance Bureau staff) for semi-structured in-depth interviews	Semi-structured in-depth interviews	Designed a policy analysis framework based on Gilbert's framework: allocation base, type of provision, delivery strategy, finance mode, and external environment
(He et al., 2019)	Related academic works and documents in the field of social insurance and LTCI, as well as LTCI	Literature review and comparative research method	Insured subject, financing channel, financing standard, beneficiaries, fundraising management

	pilot policy documents issued by 15 pilot regions		
(Li and Qian, 2023)	Policy documents issued by local governments of pilot cities	Comparative research method	Financing form, financing channel, financing standard, insured subject, level of benefits, scope of coverage
(Li and Wei, 2017)	Policy documents issued by local governments of pilot cities	Case study	Insured subject, financing, fund management, beneficiaries, benefit payment
(Li and Ming, 2020)	Policy documents issued by local governments of pilot cities	Comparative research method	Insured subject, financing channel, financing standard, financial model
(Song and Sun, 2020)	Policy documents issued by local governments of pilot cities	Policy evaluation	Policy and regulations, supply mechanism, financing model, social-cultural context, human resources
(Wen and Kong, 2020)	Policy documents issued by local governments of pilot cities	Policy evaluation	Supply side, demand side
(Wu et al., 2018)	Policy documents issued by local governments of pilot cities	Comparative research method	Financing approach, financing standard, premium payment, financing channel
(Yang et al., 2021a)	Drawing data from 47 semi structured, in-depth individual or group interviews in 2016	Case study	Eligibility rules, service covered, main source of revenue and service costs, equity in access to care and efficiency in financing
(Yang et al., 2016)	Academic and grey literature	Systematic narrative review of academic and grey literature, supplemented with qualitative interviews with government officials from relevant departments, care home staff and service users	Efficiency and equity
(Zhang and Zhang, 2022)	Policy documents issued by local governments of pilot cities	Comparative research method	Financing source, financing standard, funding base, financing structure
(Zhang and Yang, 2019)	Policy documents issued by local governments of pilot cities	Case study	Eligibility, beneficiaries, financing standard, benefit standard
(Zhou and Wang, 2019)	Policy documents issued by local governments of pilot cities	Comparative research method	Financing channel, insured subject, financing standard, benefit payment, level of benefits

Quantitative Research

Quantitative research is the most commonly employed methodology among the academic sources reviewed in this chapter, comprising 36 articles, or 65 per cent of the total. This includes 26 Chinese-language articles (accounting for 65 per cent of all Chinese sources) and 10 English-language articles (67 per cent of all English sources). Despite the disparity in the number of publications, the methodological preferences of scholars across both linguistic groups show minimal variation. Detailed information on the data sources, approaches, variables, and language distribution of these 36 quantitative studies is presented in Table 3.

Data Sources

From the perspective of data sources, three primary categories can be identified:

First, macro-level data, which includes statistics officially published by Chinese authorities. This category comprises data related to LTCI released by central and local governments, census data, statistical yearbooks, and international sources such as the United Nations World Population Prospects and the American Association of Health Insurance.

Second, micro-level data, which refers to datasets collected and compiled by

academic institutions through structured surveys. Notable examples include the *China Health and Retirement Longitudinal Study (CHARLS)*, the *China Longitudinal Ageing Social Survey (CLASS)*, the *Chinese Longitudinal Healthy Longevity Survey (CLHLS)*, and the *China Pilot Long-Term Care Insurance Policy Database (CLIP)*.

Third, other sources, which encompass data obtained through fieldwork and interviews, as well as datasets collected from online platforms focused on pensions and LTC.

While most of these data sources are considered reliable and authoritative, they also present certain limitations. For instance, Chen and Shi (2021) highlight inconsistencies in the measurement of dementia due to discrepancies between the CHARLS questionnaire and China's LTCI assessment standards. The absence of specific indicators for dementia undermines the accuracy of evaluations. Additionally, Chen and Shi (2021) note that when calculating annual LTCI benefit amounts, the reliance on data solely from pilot cities restricts the generalisability of the findings.

Approaches

In terms of model design and selection, ten principal quantitative models have been identified across the reviewed literature. These include actuarial models,

regression models, Data Envelopment Analysis (DEA), Markov models, GM (1,1) models, simulation models, PMC index models, system dynamics (SD) models, and projection models or equations. Among these, the most frequently employed are the Markov model, the actuarial model, and models derived from the ILO framework, such as demographic and economic models, income estimation models, cost budgeting models, and outcome evaluation models.

The ILO Social Budget Model (sometimes referred to in Chinese literature as the ‘ILO financing model’ or ‘ILO actuarial model’), developed by the International Labour Organisation and further refined in collaboration with the International Social Security Association in the early 2000s, applies actuarial and quantitative techniques to social protection systems, including health care, pensions, and LTC (Guo, 2017). It employs actuarial methods grounded in probability theory and mathematical statistics, combined with insights from economics, demography, and the social sciences (Guo, 2017). Grounded in the principle of fund balance, which requires that the total expenditure of a social insurance scheme over a given period be approximately equal to its total income, the model estimates contribution rates for social health insurance and related schemes (Yang et al., 2022).

The ILO Social Budget Model structured around four sub-modules: the demographic and economic module, the income estimation module, the cost

estimation module, and the result module (Zhang et al., 2020b). The framework is directly applicable to the financial assessment of LTCI. It has been widely used in studies related to funding levels and contribution rates in the Chinese context (Guo, 2017; Ma et al., 2022; Wan, 2023; Wang et al., 2021).

Markov chain theory, initially utilised in biological sciences, has become increasingly prevalent in financial and actuarial studies. Foundational works such as those by Scheerer (1969) and Çinlar (1975) established its mathematical framework, while applications in actuarial fields have been demonstrated by studies like Daniel (1954) and Borowiak and Shapiro (2014). Markov models are particularly suited to assessing mortality rates, survival probabilities, and cash flow patterns. Within the domain of LTCI, these models have been adopted to estimate the health transition probabilities of older individuals across different ages, sexes, and levels of disability. This is often achieved by integrating data from large-scale surveys such as CHARLS and CLHLS (Chen and Shi, 2021; Yang et al., 2023; Zhu and Ma, 2023; Jin et al., 2023).

Regarding actuarial models more broadly, Hassani et al. (2020) note that actuarial science spans a wide range of applications, including the pricing of insurance policies, healthcare cost modelling, and risk assessments related to climate, natural disasters, and cyber threats. The growing availability of high-

quality data enhances the precision of actuarial models and supports more accurate insurance pricing (Hassani et al., 2020). In the context of China's LTCI system, actuarial models have been applied extensively to project LTC costs and funding requirements. These include dynamic actuarial models (Tang and Su, 2021), long-term actuarial models (Tang et al., 2022a), medical insurance actuarial models (Tian, 2020), and models combining actuarial and Markov approaches (Zhu and Ma, 2023). However, the review reveals a notable distinction between Chinese and English literature. While Chinese scholars frequently utilise independently developed actuarial models, English-language studies tend to incorporate actuarial approaches only within broader frameworks such as the ILO, without deploying standalone actuarial models.

Table 3 Overview of quantitative research approaches in selected LTCI studies

Author	Data source	Approaches	Variables	Language
(Chen and Zhao, 2021)	14662 claim data of LTCI in Shangrao City in 2018 (including gender, date of birth or age, benefit type, benefit start time, benefit end time, service cost and insurance reimbursement)	Microsimulation model	Analysis variables: gender, age group, status	Chinese
(Chen et al., 2021a)	CHARLS 2015 and 2018	Microsimulation model	Simulate the health transition trajectories of 1 million individuals from 2020 to 2024 and estimate the financial revenue and expenditure after national promotion after weighting	Chinese
(Chen and Shi, 2021)	CHARLS 2015 and 2018	Markov model and logit regression model	Dependent variable: health status at the end of 2018. Independent variables: health	Chinese

			status at the beginning of 2015, age, gender, birth cohort	
(Chen, 2022)	National Statistical Yearbook, Census Data, and CHARLS (2015)	LTCI fund's expenditure model and income model, LTCI fund's balanced supply and demand model	Expenditure model: population of disabled older people, degree of disability, care methods, and unit cost of care; Income model: overall contribution rate, wage level, and number of contributors	Chinese
(Chen, 2023b)	Policy texts of the second batch pilot cities	PMC index model	10 primary variables and 31 secondary variables with the financing mechanism	Chinese
(Guo, 2017)	Shanghai government and care home websites	ILO Social Budget Model	Population estimation: population, employed population, average social wage; Income estimation: premium income, state financial subsidies, fund investment income and other income; Cost estimation: care expenses, management expenses, other expenses	Chinese
(Jin et al., 2023)	CLHLS 2005-2018, the National Bureau of Statistics of China, the World Population Prospects 2022	Markov model and a component-based model	Household income per capita, wage level, urbanisation rate, marital status rate, co-residence rate, age-, sex-, and disability-specific group, dementia rates	English
(Lei et al., 2016)	CLHLS 2011	Logit regression model	Dependent variables: availability of social care, availability of health care; Independent variables: social security benefits derived from those have pensions and public free medical services (Generous), those who have public old-age insurance or other old-age insurance and medical insurance (Moderate), and those who have no old-age insurance and medical insurance (No). The other independent variables include age, gender, household income in the previous year	English

(Li and Otani, 2018)	CHARLS 2015	Macrocosmic prediction model	Government revenue, per capita government revenue, age 65+population, LTC costs	English
(Li, 2020a)	CHARLS 2015	Overall simulation model	Disability population estimation: urban and rural areas, age, disability level, disability rate, and care methods; Financial needs estimation: urban and rural areas, disability level, unit care cost, and total care cost	Chinese
(Li and Guo, 2021)	Documents published by the Shandong pilot city medical insurance bureau website and local governments	Data Envelopment Analysis (DEA)	Output indicators: number of people covered, fund expenditure; Input indicators: fund income, premium payment level of insured persons, per capita fiscal subsidy amount	Chinese
(Lin, 2016)	Statistical Yearbook, the Sixth National Census, previous academic research data	Annual fund balance model	Premium income, LTCI support ratio, average payment level, average wage level	Chinese
(Liu and Wang, 2020)	Statistical yearbooks of pilot cities in 2019 and Wind database	DEA and coupled coordination model	Insurance fund income, LTCI coverage rate, payment level of the disabled population, per capita premium subsidy, LTCI's level of benefit	Chinese
(Lu et al., 2017b)	CHARLS 2011 and the Sixth National Census	Multinomial logistic regression and simulation	Healthy levels, age group, sex, marital status, medical insurance, education, children, income level	English
(Ma and Zhang, 2022b)	Anhui Province Statistical Yearbook, China Statistical Yearbook, and data published by Pension Network	ILO actuarial model	Number of insured persons, insurance coverage rate, average wage level, contribution base, care and management costs, number of disabled people	Chinese
(Ma et al., 2022)	2020 Anhui Province Statistical Yearbook and China Statistical Yearbook, and data published by Pension Network	ILO Social Budget Model	Population and economic model: total labour force, number of UEBMI participants, labour participation rate, urban employment, urban labour productivity, average wage level, urban GDP; Income estimation model: number of UEBMI participants, insurance coverage	Chinese

			rate, number of insurance contributors, average payment base, national fiscal subsidies, social donations, and investment income of funds	
(Pan et al., 2021a)	Statistical data from the Shanghai Municipal Government and the Medical Insurance Bureau	GM (1,1) model	Total population, number of employees paying contributions, contribution base, per capita fundraising, total fundraising, population data over 60 years old (including total number of employees and number of disabled people), total expenditure on severe disability	Chinese
(Peng et al., 2022)	76 LTCI policy documents published between 2016-2021	PMC index model	9 main variables and 36 sub-variables (not all of which are listed here for reasons of space)	English
(Sun et al., 2020)	Actual operation data of Qingdao LTCI from 2012 to 2017	Actuarial model of fund expenditure	Expenditure of disabled and demented people, care service content, disability rate, disability level, annual care expenses, insurance participation	Chinese
(Tang and Su, 2021)	The seventh National Census Data, CLHLS 2008, 2011, 2014, 2018	Dynamic actuarial model, the continuous time homogeneous Markov process and the generalised linear model	Wage levels of urban employees and per capita disposable income of residents and their growth rates, care preferences for disabled older people, costs of different care methods and cost growth rates	Chinese
(Tang and Su, 2021)	The National Census, Statistical Yearbook, data released by the National Health Insurance Administration in 2020	Long-term actuarial model	Income: number of insured persons, per capita funding in each year, funding growth rate; Expenditure: size of disabled population, care preferences, different care costs	Chinese
(Tian, 2020)	The Sixth National Census, field survey data	Medical insurance actuarial model	Demand: disabled population, disability level, care methods, care costs, annual growth rate of care costs; Expenditure: per capita medical insurance expenditure, cost growth rate, medical insurance	Chinese

			compensation ratio; per capita LTC expenditure, cost growth rate, LTCI compensation ratio, financial subsidies, number of insured persons	
(Wan, 2023)	Actual operation data of LTCI in Shangrao	ILO Social Budget Model	LTCI reserve, contribution rate, total contribution base of insured persons, total fund expenditure	Chinese
(Wang et al., 2021)	2019 China Statistical Yearbook, 2018 Medical Security Development Statistical Bulletin, 2017 Shanghai Elderly Population and Ageing Industry Monitoring Statistics	ILO Social Budget Model	LTCI reserve, contribution rate, total contribution base of insured persons, discount rate, total fund expenditure	Chinese
(Xu and Chen, 2019)	National Bureau of Statistics in China, China Health and Family Planning Statistics Yearbook, China Statistics Yearbook, China Health and Family Planning Statistics Yearbook, China Insurance Yearbook, American Association of Health Insurance, China's Long-Term Care Survey Report 2017, CLHLS, SSAPUR, and CLASS	Bayesian quantile regression (BQR) method	Dependent variables: the different types of disabled older people over 65: total disability, mild disability, moderate disability, and severe disability); Independent variables: chronic diseases (aged over 65), per capita medical care cost, health technicians (per thousand population)	English
(Yang et al., 2023)	CHARLS 2015 and 2018, CLIP database, World Population Prospects (2022)	Markov model and fund expenditure scale prediction model	Care type, beneficiaries, inflation rate, number of insured persons, disability rate	Chinese
(Yang et al., 2022)	2012-2020 China Labor Statistics Yearbook, the 2012-2021 Shandong Statistical Yearbook, the 2020 Shandong Provincial Medical Security Development Statistical Bulletin and government statistical bulletins and related documents	ILO Social Budget Model	Number of urban workers, number of people participating in UEBMI, GDP, average wage level, proportion of actual contributors, contribution base, premium income, contribution rate, number of non-premium income service recipients, average cost of service items, total cost, other costs, contribution level	English
(Yang, 2019)	The Sixth National Census,	LTCMI financial	Total number of insured	Chinese

	Qingdao City LTCI Interim Regulations	actuarial model	employees, average wage of employees, contribution rate, financial subsidy standard, interest rate, retirement age of urban population, average wage growth rate of urban employees, disability rate, care cost	
(Yu, 2021)	Pilot city implementation plan documents	LTCI payment level formula	Total social security expenditure, GDP, care mode, reimbursement ratio, beneficiaries, and time of receiving care	Chinese
(Zhang et al., 2020b)	CLHLS, the World Population Prospects of the United Nations, the National Bureau of Statistics of China, Taiwan Ministry of Health and Welfare, and published research literature	ILO Social Budget Model	Income: insurance payers, the average wage level, contribution rate, growth rate of wages of employees, total premium payments, the government financial subsidies, investment and operation income of insurance institutions; Expenditure: the number of older people, care level, utilisation ratio of the care type, care costs, the growth rate of care costs	English
(Zhang et al., 2021)	Xiamen Special Economic Zone Yearbook and field survey	System dynamics model (SDM)	17 parameters (not all of which are listed here for reasons of space)	English
(Zhang et al., 2022a)	Field research, expert consultation, China Statistical Yearbook, and published research literature	System dynamics model (SDM)	13 parameters (not all of which are listed here for reasons of space)	English
(Zhang et al., 2022b)	Field research, government routine statistics and research literature	System dynamics model (SDM)	25 parameters (not all of which are listed here for reasons of space)	Chinese
(Zhang, 2020)	The Sixth Population Census of the National Bureau of Statistics, data from the official website of the German Ministry of Health, survey database of the National Office on Ageing, pilot documents from Nantong and Qingdao	Break-even predicting model	Disability rate, proportion of beneficiaries, benefit level, care cost, average social wage, contribution amount, contribution age	Chinese
(Zhou and	China Statistical Yearbook	Fundraising	Individual payment standards,	Chinese

Zhang, 2022)	2015	amount forecast formula	medical insurance fund transfer fees, disposable income	
(Zhu and Ma, 2023)	CHARLS 2015 and 2018, census data, statistical yearbook	Markov model, logit model, population projection model, funding actuarial model	Probability matrix of health status transition of the older population, urban and rural population, population migration rate, average social wage of urban employees, LTCI care cost, LTCI contribution base	Chinese

Mixed-method Research

Among the 55 academic sources included in the structured review, mixed-method research accounts for 6 per cent, comprising two English-language studies (Guo and Li, 2022; Lu et al., 2017a) and one Chinese-language study (Zhu et al., 2023). These studies focus on three different pilot cities: Nantong, Qingdao, and Nanning. The primary data sources include statistical data released by local government departments, as well as observational data obtained through field visits or interviews conducted by the authors (see Table 4 for further details).

Mixed-method research combines qualitative and quantitative data collection and analysis techniques within a single study. This approach enables policy researchers to explore complex issues qualitatively while also interpreting patterns and trends through numerical data, visualisations, and basic statistical analysis (Creswell, 1999). As Creswell (1999) argues, multi-method policy research offers a more comprehensive understanding of intricate social

phenomena. It draws on multiple perspectives and provides a more balanced and inclusive analysis than studies employing a single methodological approach, thereby addressing the interests of a wider range of stakeholders.

Table 4 Overview of mixed-method research approaches in selected LTCI studies

Author	Data source	Mixed method	Variables in quantitative model
(Guo and Li, 2022)	The seventh national population census bulletin, the 13th Five-Year population development plan, the Nantong Municipal Bureau of Statistics and Nantong Statistical Yearbook 2020 from Nantong government, and the authors' field survey data in the Medical Insurance Bureau of Nantong	Field interview and a LTCI revenue and expenditure forecasting model	Total population, financing standards, per capita disposable income, disability rate, the institutional and home care ratios and their corresponding costs
(Lu et al., 2017a)	The data comprise 23,828 individual observations, covering the entire client activity of the Qingdao LTCMI from July 2012 through 15 April 2014	Documentary analysis and a logit regression model	The dependent variable: exit status of recipient. The explanatory variables: age, sex, ADL scores, types of service received, and disease recorded.
(Zhu et al., 2023)	The Guangxi Health Statistics Yearbook (2006-2012), the Guangxi Health and Family Planning Statistics Yearbook (2013-2017), the Guangxi Health Statistics Yearbook (2018-2021), the 2021 Nanning Medical Security Bureau data bulletin, and the service charges of 8 designated LTCI nursing institutions in Nanning collected by the author through field visits and telephone interviews	Fieldwork and phone interview, ILO Social Budget Model	Population, average wage level, care costs, disability rates

In summary, of the 55 reviewed sources, most adopt quantitative methods, followed by qualitative and a few mixed-method studies. Quantitative research

commonly uses the ILO Social Budget Model, Markov models, and actuarial models, while qualitative studies rely on comparative analysis of policy documents and interviews. English literature lacks independently developed actuarial models.

3.4 Research Gaps and Analytical Focus

In conclusion, extensive research has been conducted on China's LTCI system, examining its impact on formal and unpaid caregivers, disabled older individuals, and overall health outcomes following the implementation of pilot policies. Scholars have investigated the interaction between LTCI and unpaid family care, including substitution and crowding-out effects, as well as the relationship between LTCI and public basic medical insurance, particularly in relation to healthcare utilisation, medical expenditure, and policy efficiency. In addition, several studies have focused on the factors influencing individual decisions to participate in LTCI schemes.

The aim of this thesis is to examine the development of China's LTCI pilot system during the 2016 and 2020 phases across 29 pilot regions, and to assess the implications of the fiscal subsidies in the financing process of different pilot policies when scaled up to the municipal, provincial, and national levels. Building on this objective, this final section of the literature review discusses how existing studies have informed the research design of this thesis.

1. Analytical indicator for fiscal affordability

Among the 55 studies on financial sustainability reviewed earlier, the majority use Gross Domestic Product (GDP) as the analytical indicator when assessing fiscal affordability (Guo, 2017; Chen, 2022; Tian, 2020; Wan, 2023) and LTC costs (Jin et al., 2023; Guo and Li, 2022; Sun et al., 2020). GDP is primarily employed to evaluate the macro-level affordability of government spending or to compare variations in fiscal capacity between regions. However, this thesis argues that GDP, which is a standard measure of a country's value-added production of goods and services over a given period, does not accurately capture the government's disposable fiscal capacity in the context of LTCI sustainability.

Instead, this thesis adopts general public budget revenue (GPBR) as the core indicator, as it better reflects the government's tax-based income earmarked for public welfare, institutional functioning, and national development (Ma, 2025). General public budget revenue in China is defined as tax-based income allocated to safeguarding and improving people's livelihoods, promoting economic and social development, ensuring national security, and maintaining the normal functioning of state institutions (Ma, 2025). In both national and local statistical reports, it is categorised under 'fiscal revenue: general public budget revenue'.

Li (2020a) partially adopted this approach by estimating the subsidy rate across nine pilot models, although without specifying the exact subsidy values or calculation methods. A more recent study on LTCI conducted in 2025 by Chen et al. (2025) expanded on this by using the ratio of total fiscal expenditure to regional revenue and examined cost-sharing between governments and individuals. This thesis builds on these approaches by systematically modelling fiscal subsidies as a share of GPBR across different regions and administrative levels, with the methodological design presented in Chapter Five and the results presented in Chapter Seven.

2. Projection analysis: demand vs. supply side

The articles included in the structured review primarily focus on projections of LTC costs (Jin et al., 2023; Xu and Chen, 2019; Chen and Shi, 2021) and contribution rates (Zhang et al., 2020b; Lei et al., 2016). However, most adopt a demand-side perspective, that is, beginning with forecasts of the disabled population or LTC needs to conduct balance estimations of the LTCI system. Due to the limited availability of reliable data on China's oldest-old population, estimates of disability prevalence and the number of older individuals with disabilities are frequently subject to bias (Liao and Wang, 2021). Most existing calculations rely on census data or national databases (Cheng and Yang, 2024). Even when using the same data source, discrepancies in the survey wave often

result in inconsistent findings regarding disability patterns among the older population (Liao and Wang, 2021).

Moreover, as China's current LTCI system provides services on a needs-based basis, the type and corresponding cost of services vary depending on the level of disability. However, when projecting costs, many studies assume a uniform unit price for services (Chen and Shi, 2021; Lu et al., 2017b) and do not account for GDP growth (Sun et al., 2020). Such simplifications may result in distorted projections and hinder meaningful comparisons across regions. In addition, as China's LTCI system is still in the pilot phase, available data remain limited. While the relatively long forecasting horizons adopted by Lu et al. (2017b) and Xu and Chen (2019) allow for the simulation of long-term institutional impacts, projections extending beyond ten years may be subject to significant error. Other researchers have opted for shorter forecasting periods of around ten years. For instance, Yang et al. (2023) employed a Markov model combined with population projections and policy parameters, achieving better error control. Sun et al. (2020)'s study, based on real local data and actual service costs, is more suitable for high-precision fiscal forecasting.

Given these issues, this thesis adopts a supply-side perspective (contribution or premium financing stage), focusing on the magnitude and structure of fiscal subsidies within the LTCI financing process. It uses real policy data to project

subsidies from 2025 to 2035, emphasising local governments' fiscal capacity under various policy expansion scenarios, with the methodological design presented in Chapter Five and the results presented in Chapter Seven.

3. Multi-level administrative focus

Existing studies tend to focus on a single administrative level, most commonly the municipal level, when assessing LTCI fiscal sustainability. Few systematically evaluate the interaction and scalability of fiscal pressure across municipal, provincial, and national levels. Moreover, studies of the second batch of pilot cities introduced in 2020 remain scarce. This thesis addresses these gaps by comparing fiscal subsidy arrangements across all 29 LTCI major pilot regions, including both the first (2016) and second (2020) batches, thereby providing a more comprehensive assessment of the fiscal implications of policy scaling, which is discussed in Chapter Eight.

4. Role of public-private partnerships (PPPs)

During the literature review process, it also became evident that studies examining the involvement of commercial insurance companies in LTCI governance are scarce. This area of inquiry, typically framed as the engagement of third-party institutions or PPPs, has received limited academic attention. A targeted search using terms such as 'social-commercial cooperation' (社商合作) or 'public-private partnership' in conjunction with 'China'

across both Chinese and English academic databases (CNKI and Web of Science) identified only thirteen relevant publications between 2018 and 2023, comprising eight Chinese and five English articles. Notably, the English-language studies did not directly examine PPPs within the context of the LTCI pilot system, and none of these publications considered the issue of fiscal sustainability within PPP-based arrangements. Consequently, they were excluded from the structured review.

However, the policy significance of this research gap has grown. Since the implementation of the expanded LTCI pilot programme in September 2020, the Chinese central government has officially encouraged the participation of non-governmental organisations and third-party actors in LTCI governance. This includes commercial insurance providers who contribute to service delivery, disability assessment, and the promotion of market-based mechanisms. These developments reflect a strategic shift towards establishing a diversified, multi-actor care delivery system under PPP frameworks.

To address these gaps, this study adopts a structured comparative approach to analyse the evolution of China's LTCI pilot system, with particular attention to policy developments in the initial pilot phase (2016) and the expanded phase (2020). Subsequent chapters (Chapters Six and Eight) build on this framework to explore institutional dynamics and policy mechanisms in greater depth,

including the evolving roles of third-party actors within PPP arrangements.

5. Summary of research design implications

In response to the identified gaps, this thesis will conduct a structured comparative policy review to study the evolution of China's LTCl pilot system, with emphasis on the differential roles of public and private actors. The quantitative analysis draws on official municipal, provincial, and national data to assess both historical trends and projected outcomes. Forecasts are conducted using an integrated GM (1,1) grey forecasting model combined with cell-based aggregate projection models, focusing on three subsidy types (fixed-sum, proportional, and mixed) and their fiscal impact as a percentage of general public budget revenue between 2025 and 2035.

The full research design and modelling strategy are outlined in Chapter Five, while Chapter Four provides the theoretical foundation underpinning these design choices.

CHAPTER FOUR: THEORETICAL FOUNDATION

4.1 Overview

As examined in the Chapter Two, China's long-term care (LTC) and long-term care insurance (LTCI) system have gone through 75 years of development and reform (from 1949 to present). The LTCI pilot scheme has entered the expansion stage from the initial pilot stage. However, the LTCI policy is still a new/in pilot form and has not been implemented in nationwide China. According to the two pilot documents (Ministry of Human Resources and Social Security of the People's Republic of China, 2016; National Healthcare Security Administration of China and Ministry of Finance, 2020), the pilot cities and regions are sporadically distributed, and show a trend of gradually extending from the southeast coast to the central and western regions (shown as Figure 10). Zeng (2021) indicates that expanding the scope of the pilot program is an inevitable trend, but the time is not yet ripe for full promotion.

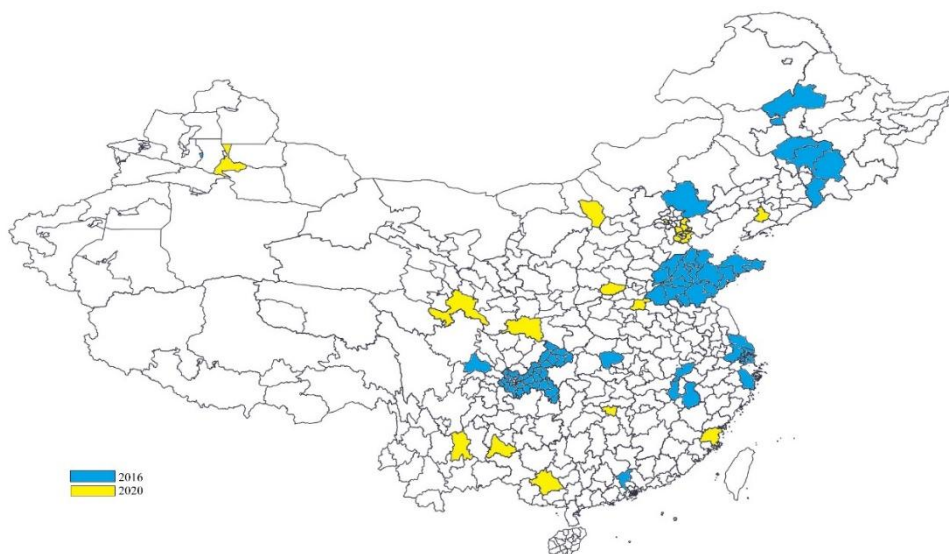


Figure 10 The distribution of LTCI pilot cities in China

Internationally, the development of long-term care insurance (LTCI) systems has followed diverse yet patterned trajectories shaped by demographic pressures, domestic political configurations and selective cross-national policy learning. Campbell et al. (2009) demonstrate that Germany, Japan and the Republic of Korea each adopted LTCI at moments when domestic institutional constraints and rising care demands converged with the availability of foreign policy ideas that could legitimise reform. Rather than direct imitation, cross-national influences operated primarily through the transfer of ideas and conceptual frames, offering evidence of feasibility and normative justification for policy choices. In this sense, Japan's move toward a social insurance model drew on Germany as a source of legitimacy, while Korea in turn looked to Japan as an empirical precedent.

Against this backdrop, China's LTCI pilot expansion can be positioned within a broader international narrative in which policy adoption emerges through endogenous pressures but is conditioned by the availability of external policy models. While the Chinese case is driven chiefly by central–local institutional dynamics and national strategic priorities, the global evolution of LTCI provides an important contextual lens through which China's pilot-based institutional change can be interpreted.

This thesis examines the development trajectory of China's LTCI pilot policies,

with a particular focus on the fiscal sustainability of government subsidies during the financing phase. A comprehensive theoretical framework is constructed, integrating a fiscal sustainability analysis framework, policy diffusion theory, and the perspective of central-local government relations (央地关系视角).

First, to evaluate the long-term sustainability of government subsidies under various policy scenarios, this thesis draws upon projection-based fiscal sustainability modelling approaches proposed by institutions such as the OECD and IMF. Specifically, it establishes a GM (1,1) grey forecasting model alongside cell-based aggregate projection models, with the aim of quantitatively assessing the implications of scaling up current LTCI subsidy models from the municipal level to the provincial and national levels, with the methodological design presented in Chapter Five and the results reported in Chapter Seven. Second, in light of the progressive expansion of the two phases of LTCI pilot implementation, this research introduces policy diffusion theory to compare regional variations in financing mechanism, benefit design, disability assessment, and public-private partnerships (PPPs) (Chapter Six). Lastly, the thesis employs the perspective of central-local government relations to analyse the dynamics of policy diffusion within the LTCI pilot system. This perspective highlights issues such as policy fragmentation, regional disparities, the outcomes of policy experimentation, and the evolving roles and responsibilities

of different levels of government, which are further examined in the discussion (see Chapter Eight).

Based on the structured review in the Chapter Three, Section 4.2 will briefly present the frequently used theories in LTCI studies, including evolutionary game theory, demand theory, Maslow's hierarchy of needs, welfare pluralism, and theory of public service chain. Section 4.3 outlines the theoretical foundation of this thesis, drawing upon projection-based approaches to fiscal sustainability, the mechanisms of policy diffusion across governance levels, and the perspective of central-local government relations. Section 4.4 is a summary of this chapter.

4.2 Frequently Used Theories

4.2.1 Evolutionary Game Theory

With the deepening of population ageing in China, the LTCI system has been proposed as a policy instrument to address the care needs of older adults with disabilities. The design and implementation of this system hinge upon the dynamic strategic interactions among multiple stakeholders, making evolutionary game theory a frequently referenced analytical framework in Chinese LTCI research.

For instance, in the domain of medical-care integration and resource

coordination, Chen et al. (2020c) developed an evolutionary game model to examine how elderly care institutions and medical institutions make decisions regarding resource allocation in cooperative settings. The term ‘elderly care institutions’ is a literal translation from Chinese ‘养老机构’, referring to residential facilities providing care services for older people in China’s official policy classification. In this thesis, the term will be used in this policy-specific sense. Sun et al. (2022), on the other hand, focused on the cooperative games between medical institutions and social care organisations in the provision of integrated services for older people. Based on the conflicts between families and care institutions, Hu and Zhang (2023) revealed the impact of governmental intervention on the stability of cooperative strategies. In the realm of older adult care involving the tripartite participation of government, enterprises, and residents, Fu et al. (2023) constructed an evolutionary game model grounded in rural China’s PPP care service projects for older people, highlighting the advantages of this theoretical approach in simulating the interactions among various actors under LTCI policies. Hong et al. (2022) further developed an evolutionary game model between government and commercial insurance companies within the PPP framework of LTCI, demonstrating that governmental strategies directly influence the enthusiasm of insurance providers.

It is evident that evolutionary game theory has been widely employed in the

study of China's LTCI to simulate the behavioural choices and strategic evolution paths of multiple actors across various stages such as policy design, governance collaboration, and service provision. Such research typically focuses on the stability of cooperation during policy implementation, the control of moral hazard, and the effectiveness of incentive and sanction mechanisms. While the theory offers a robust analytical framework for understanding behavioural feedback in the operation of LTCI systems, its emphasis tends to lie in institutional games, governance models, and behavioural dynamics, rather than on issues concerning fiscal constraints and systemic sustainability.

4.2.2 Demand Theory

Theoretically, individuals always possess a psychological desire to alter their consumption levels (Liu and Hu, 2022). However, constrained by economic conditions, their consumption decisions or behaviours inevitably exhibit a hierarchy of priorities (Liu and Hu, 2022; Kahneman and Tversky, 2013). Studies adopted demand theory often discuss the level and classification of LTC service needs, and based on this, define the content and design concept of the LTC service package. For example, Liu and Hu (2022) indicate that the demand for LTC services for disabled older people present hierarchical characteristics due to the differences in the level of disability. According to the evolutionary characteristics of demand, it can be divided into two parts: basic common needs and auxiliary personalised needs (Liu and Hu, 2022). Setting

up a LTCI service package will not only provide LTC service precisely, but also promote the high-quality development of the marketisation of LTC services (Liu and Hu, 2022). Zhou (2018) examines the factors influencing the demand for LTCI among urban residents and finds that, in addition to economic factors like social insurance expenditures, which significantly affect LTCI demand, non-economic factors such as the per capita education level and the elderly dependency ratio have an even greater influence.

Based on the demand theory (market demand theory), Cao (2016) emphasises that when designing the LTCI system, several issues must be considered: First, is the LTC price acceptable to the public? Could excessively high prices lead some individuals to forgo purchasing LTC? Second, might private LTCI induce short-sighted behaviour among individuals? How can the drawbacks of market failure in the private LTCI sector be addressed? Additionally, are there risks of moral hazard and adverse selection? Third, who should be responsible for meeting the needs of disabled older individuals who are unable to afford LTC – private institutions or public agencies?

These studies adopt a demand-side perspective, focusing primarily on service recipients, namely, older adults with disabilities, to explore how the need for LTC services emerges, and subsequently extending the analysis to the content and design of LTCI service packages. While such analyses offer valuable

insights into the identification of target beneficiaries and user heterogeneity, they tend to pay relatively limited attention to the macro-level fiscal sustainability on the financing process (the supply side), issues that constitute the central focus of this study.

4.2.3 Maslow's Hierarchy of Needs

Maslow's Hierarchy of Needs (HON) is a developmental psychology theory proposed by Maslow (1943). It divides human's needs into five levels, including physiological needs, safety needs, love and belongingness needs, esteem needs, and self-actualisation needs (Maslow, 1943). The Maslow's hierarchy of needs is commonly applied to discuss quality evaluation of LTC facilities (Zhang et al., 2022d) and disability assessment issues within LTCI (Cao, 2016).

Building on Maslow's hierarchy of needs theory, Zhang et al. (2022d) construct a comprehensive LTC quality indicator system tailored to the Chinese context. Using literature review, expert consultation, and the analytic hierarchy process (AHP), the study establishes a three-tiered evaluation framework composed of 7 primary indicators, 19 secondary indicators, and 107 tertiary indicators. These indicators span across physiological care, safety, emotional support, respect, and other dimensions, directly mapping onto the levels of human need outlined in Maslow's model. The study illustrates how LTC service evaluation can be structured according to the layered needs of older adults, ranging from basic

survival to dignity and self-actualisation.

Extending this approach, Shen et al. (2020) conduct a phenomenological qualitative study to explore the emerging care needs of disabled residents in Chinese nursing homes. Based on in-depth interviews with 23 participants, the research identifies four key dimensions (intelligent technology, security, participation, and spirituality) which further include twelve specific needs such as intelligent health monitoring, privacy protection, social engagement, and dignity preservation. These findings emphasise that older adults' LTC needs increasingly reflect higher-order psychological and self-fulfilment concerns, consistent with the upper tiers of Maslow's hierarchy.

While the above studies focus on the demand-side experience of LTC service recipients, Cao (2016) applies Maslow's theory to analyse differences in LTCI demand among older adults with disabilities, highlighting the variability of individual care needs across time and health conditions. Cao (2016) argues that even the most basic physiological needs may vary among individuals depending on factors such as disability duration, severity, and care costs. This variability, in turn, complicates the design of standardised LTCI benefit packages and challenges financial demand projections.

Together, these studies demonstrate the usefulness of Maslow's theory in

structuring and interpreting LTC service demand. However, this thesis does not focus on beneficiary-level service design or need-based classification. Instead, it focuses on the supply-side financing mechanisms of LTCI, particularly government subsidies, and their fiscal sustainability under national expansion scenarios. As such, while Maslow's framework provides conceptual background on why LTC services must evolve in scope and quality, it is not employed as a primary analytical framework in this thesis.

4.2.4 Welfare Pluralism

In the 1980s, the trichotomy of welfare emphasised that welfare provision is the responsibility of the whole society, and that the state is not the only responsibility bearer, the family, the market, and the state should all be welfare providers (Rose, 1986). In the 1990s, the welfare quarter added a voluntary sector based on the three welfare supply subjects (family, market, and state) described in the welfare trichotomy (Johnson, 1999). While long established in the UK, the theory of welfare pluralism offers new perspectives on the financial provision of LTCI for disabled older individuals in China. The providers of LTCI services can be diversified, including individuals or families purchasing services from the market, community or volunteer organisations, as well as government entities (Cao, 2016). These providers can operate independently or collaborate to offer comprehensive care (Cao, 2016).

For example, using welfare pluralism as a framework, Cheung et al. (2023) explore older adults' decisions regarding family- and community-based care amidst the complex interactions between the government, enterprises, communities, and families. The findings indicate that government subsidies and local wage levels play a significant role in encouraging the choice of community-based care, while underscoring the importance of direct government care provisions in supporting ageing in place and reducing regional disparities (Cheung et al., 2023).

With the implementation of LTCI, various regions in China have introduced community-based aged care policies and pilot programs, creating a vision where meeting the LTC needs of older adults within the community, rather than in institutions, is seen as the optimal solution (Lu and Wong, 2017). The goals of community care and support appear achievable soon (Lu and Wong, 2017). However, Lu and Wong (2017) have raised concerns about the effectiveness of community-based LTC, arguing that there are significant doubts regarding the feasibility of this policy objective. Similarly, as Cao (2016) points out, China's socio-cultural context has unique characteristics, such as the traditional value of '勤俭持家' in Chinese (translated as diligent and frugal management of the household). This cultural concept often leads Chinese families to prioritise family-based care when addressing late-in-life disability, which influences the roles of the market, community, and volunteer organisations (Cao, 2016).

Moreover, the primary income source for many older individuals in China is relatively limited, with 40.72 per cent relying on family members for support, a figure that rises to 70.38 per cent among those unable to perform daily activities (Cao, 2016). This income structure places a heavy pressure on families and limits the effectiveness of both community and market functions (Cao, 2016). Lastly, China's communities, volunteer organisations, and the LTC market are underdeveloped and lack a leading role (Cao, 2016; Lu and Wong, 2017).

Welfare pluralism offers a useful lens through which to understand the diversified structure of LTC provision, particularly the roles played by families, markets, communities, and the state. Although this theoretical approach provides valuable insights into the social logic underpinning care choices and service delivery mechanisms, the present study adopts a different analytical perspective. Rather than examining care preferences or the feasibility of community-based LTC, this thesis focuses on the sustainability of government subsidies in the financing phase of LTC from the perspectives of fiscal support and policy diffusion.

Specifically, projection-based models are employed to assess the fiscal implications faced by different levels of government (municipal, provincial, and national) when implementing various subsidy schemes. As such, welfare pluralism is not adopted as a primary theoretical framework in this research;

rather, it serves as a contextual backdrop that highlights institutional and cultural constraints within China's LTC system, particularly the limited effectiveness of non-state actors and the continued dominance of family-based care.

4.2.5 Theory of Public Service Chain

This theory is often associated with supply chain management, public service management, and public service supply chains. Sienkiewicz-Malyjurek and Szymczak (2024) point out that research on service management in the public sector is still in its early stages, despite public service expenditures being several times higher than those of private organisations and individuals. In addition to the rise of public service management, research on supply chains within the public sector has also begun to develop (Seepma et al., 2020; Arlbjørn et al., 2011; Sienkiewicz-Malyjurek and Szymczak, 2024). The potential of applying supply chain management principles in the public sector to meet the demand for co-creating public value is becoming increasingly apparent (Seepma et al., 2020).

As an effective theoretical paradigm for studying PPP models, the public service chain originates from the enterprise supply chain and service chain, and can provide an explanatory basis for solving the problems of commercial insurance companies in managing LTCI (Zhao et al., 2021). However, under the context

of China's LTCI, Zhao et al. (2021) find out that due to the influence of traditional government-society relations, commercial insurance companies face several challenges in the operation of the service chain, including government overreach under bureaucratic control, the monopolisation of social organisations in competitive markets, and the absence of consumers in the service delivery chain. To address these issues, it is necessary to refine the division of responsibilities between government entities at the start of the service chain, diversify the actors involved in the middle of the chain, and leverage digital solutions to better address the older population's care needs at the end of the chain, ensuring more effective resource delivery throughout the service process (Zhao et al., 2021).

Although public service logic offers a valuable theoretical perspective for analysing service coordination and value co-creation among multiple stakeholders within public-private partnership (PPP) models, it is not adopted as a core theoretical foundation in this study. This is primarily because the theory focuses on the micro-level operational mechanisms among actors within the service chain, emphasising collaboration and efficiency across different stages of service delivery.

By contrast, the present research concentrates on the macro-level institutional design and fiscal sustainability of the LTCI system, with particular emphasis on

the government subsidy mechanism and the distribution of fiscal pressure across different tiers of government during the expansion of pilot policies. As such, public service logic does not directly address the central concerns of this study, namely, the forecasting of fiscal pressures and the institutional implications of policy diffusion and is therefore not employed as an analytical framework in this research.

4.3 Theoretical Foundation of This Thesis

4.3.1 Policy Diffusion Theory

Theoretical Analysis

Policy diffusion theory has been employed to investigate whether, how, and why policies spread across governmental jurisdictions (Fundytus et al., 2023). The theory of policy diffusion or policy innovation diffusion was first introduced by Jack Walker in 1969. Walker (1969) posits that if an innovation is adopted by a state government, regardless of whether the innovation already exists or has been adopted by other states, its initial adoption by that state constitutes a policy innovation. This adoption is expected to catalyse a subsequent wave of adoption among other states, a phenomenon known as policy diffusion (Walker, 1969). Furthermore, Rogers (1971) defines the policy diffusion as the process through which innovative policies are transferred, imitated, recreated, and reused among different actors within a social system over a specified period via specific channels. According to Shipan and Volden (2006), this diffusion can

take place in four ways: (1) horizontally, where policies spread across the same level of government (e.g., from one province to another); (2) bottom-up vertically, where policies move from lower-level to higher-level governments (e.g., from local to provincial authorities); (3) top-down vertically, where policies disseminate from higher-level to lower-level governments (e.g., from provincial to local authorities); and (4) through replication, where a single government applies established policy concepts to a new but similar policy area (e.g., the adaptation of policy ideas across different sectors within the same government). However, Fundytus et al. (2023) argue that, although there is a substantial body of literature on policy diffusion theory within political science and policy studies, its application in the realm of public health policy remains insufficient.

The article (Gray and Wang, 2004) translated by Chinese scholar Yongbing Wang in 2004 introduced policy diffusion theory to China, and since then related theoretical research has increased (Zeng, 2021). Drawing on the specific context of China, Wang and Lai (2013) and Zhou (2012) have suggested that the diffusion of public policy in China is characterised by two dimensions: hierarchical diffusion and absorption radiation diffusion. This means that the process includes both top-down diffusion driven by administrative directives and bottom-up pilot diffusion, which involves local innovations spreading to the national level (Wang and Lai, 2013; Zhou, 2012; Li and Kong, 2023).

Examples of research on China's LTCI pilot policy based on policy diffusion theory include Zeng (2021)'s analysis of the diffusion process of the LTCI system across 48 pilot cities. The study reveals that the diffusion trend of China's LTCI system has four characteristics. It shows an S-shaped diffusion trend in time, obvious proximity effect in space, obvious vertical effect in path, and imbalance between imitation and innovation in content (Zeng, 2021). In response, Zeng (2021) recommends that the central government of China appropriately streamline administrative procedures and create a more conducive environment for policy innovation. Furthermore, local governments should adopt dialectical thinking to expedite the process of policy diffusion (Zeng, 2021). In addition, Li and Kong (2023) focus on two key questions: how does policy diffusion occur, and what are its determining factors? Using the Cox proportional hazards model and data from 31 provinces in China, Li and Kong (2023) empirically analysed the main factors influencing the diffusion of the LTCI system. The study found that the primary internal factors affecting the diffusion of the LTCI system are the local ageing index and the level of socioeconomic development, while the main external factors are national competitive pressure and central policy pressure (Li and Kong, 2023).

Linked to this, but somewhat different in focus, this thesis will discuss the feasibility and fiscal sustainability of different pilot policies being implemented nationwide in China from the perspective of policy diffusion (to be explained in

detail in later chapters). The next section will summarise the diffusion of the LTCI policy in China from the perspective of policy diffusion, including temporal evolution and geographical evolution.

The National Diffusion of LTCI

As for temporal evolution, the diffusion of China's LTCI system can be divided into four phases (summarised by the author based on the CLIP database). The first phase is the initial diffusion period (2012–2015). In response to the intensifying ageing population, the Qingdao municipal government took the lead nationwide by introducing the first policy on the LTCI system in 2012, pioneering the implementation of pilot projects. Over the following years, other early adopter cities began to emerge. For example, in 2014, Weifang issued the *Implementation Opinions on the Pilot Program for Long-Term Care Insurance for Employees*¹⁶, and in 2015, Rizhao released the *Pilot Opinions on Establishing a Long-Term Medical Care Insurance System*¹⁷. That same year, Changchun and Nantong also introduced basic care insurance systems. Subsequently, various regions began exploring LTCI initiatives. However, this period was characterised by a lack of top-level policy guidance, with the primary focus being on accumulating pilot experience, leading to a relatively slow diffusion rate (Zeng, 2021).

¹⁶ *Implementation Opinions on the Pilot Program for Long-Term Care Insurance for Employees* (Wei Zheng Ban Zi [2014] No.171)

¹⁷ *Pilot Opinions on Establishing a Long-Term Medical Care Insurance System* (Ri Zheng Ban Zi [2015] No.7)

The second phase is the acceleration of diffusion (2016–2018). In 2016, the issuance of the *No.80 document* (Ministry of Human Resources and Social Security of the People's Republic of China, 2016) provided official guidance for the LTCI pilot system and designated 15 pilot cities and two key provinces. Under the impetus of these administrative directives, the number of LTCI-related policy documents increased dramatically, marking a period of rapid diffusion. From 2016 to 2018, approximately 95 policy documents were issued at the pilot city level. By 2017, the first batch of pilot cities had all either issued or revised their LTCI policies.

The third phase is the deceleration of diffusion (2019). According to diffusion theory, after a period of rapid growth, the diffusion rate of a new policy tends to slow down over time as the policy requires further refinement and improvement. Some cities, such as Qingdao and Nantong, began to implement more detailed supportive measures for the LTCI system. However, most pilot cities still lacked comprehensive supporting policies, leading to a weakening of the diffusion trend during this period.

The fourth phase is the resurgence of diffusion (2020–2021). In 2020, the *No.37 document* (National Healthcare Security Administration of China and Ministry of Finance, 2020) was issued, calling for an expansion of the pilot scope and

the addition of 14 new pilot cities. In the same year, 11 pilot cities, including Tianjin, Fuzhou, and Kunming, introduced their LTCI pilot implementation plans for the first time. By the end of July 2021, only four provinces (Hainan, Qinghai, Tibet, and Ningxia) had yet to release their LTCI policies, indicating that the policy diffusion process was nearing its conclusion (Zeng, 2021).

As for geographical evolution, the diffusion of China's LTCI system can be explored according to seven geographical regions: North China, Northeast China, East China, Central China, South China, Southwest China, Northwest China (summarised by the author based on the CLIP database). North China includes provinces like Beijing, Tianjin, Hebei, Shanxi, and Inner Mongolia. Northeast China comprises the provinces of Liaoning, Jilin, and Heilongjiang. East China, an economically developed region includes Shanghai and the provinces of Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, and Shandong. Central China includes Henan, Hubei, and Hunan provinces. South China encompasses Guangdong, Guangxi, and Hainan. Southwest China covers provinces like Sichuan, Yunnan, Guizhou, Tibet, and Chongqing. Northwest China, a vast and less densely populated region includes Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang.

From 2012 to 2015, the origins of policy diffusion were primarily concentrated in the East China and Northeast China, with pilot cities such as Qingdao,

Weifang, Rizhao, and Nantong in East China, and Changchun in Northeast China. During this period, the lack of guidance resulted in the LTCI system being explored and tested autonomously by the pioneering pilot cities, leading to a less pronounced diffusion trend (Zeng, 2021). By 2016, the central government began to provide administrative guidance, which facilitated a rapid response from the North China and Central China, where relevant LTCI policies were introduced within the same year. The South China region, represented by Guangzhou, the Southwest region, represented by Chengdu and Chongqing, and the Northwest region, represented by Shihezi, followed suit in the subsequent year by implementing their own LTCI systems. Overall, this trend manifested as a 'leading-following' pattern.

It is noteworthy that the diffusion of the LTCI system exhibits a significant proximity effect. This means that once the LTCI system is diffused in a particular area, nearby regions with similar environmental conditions quickly engage in policy learning and emulation. This is evidenced by the fact that geographically adjacent cities tend to implement their LTCI systems in close temporal proximity. For instance, in the early diffusion phase, after Qingdao in East China issued its trial policy, the neighbouring cities of Weifang, Rizhao, and Nantong also successively adopted the same policy. Furthermore, following the issuance of *No.80 document* in 2016, cities such as Jincheng, Tianjin, and Hohhot in North China, as well as Xiangtan and Kaifeng in Central China, and Gannan Tibetan

Autonomous Prefecture and Hanzhong in Northwest China, also introduced their LTCI systems in succession. This illustrates that after the release of national guidance, the pace of policy diffusion accelerated. At this stage, the explanatory power of the proximity effect diminished, as the central government's top-down vertical influence became stronger. Consequently, the direction and process of policy diffusion were shaped by a dual effect, beginning to exhibit an interwoven trend (Zeng, 2021).

Beyond domestic patterns of horizontal and vertical diffusion, the international literature on LTCI provides additional conceptual clarity on how policy ideas travel across borders. Campbell et al. (2009) argue that cross-national diffusion in the field of LTC operates primarily through ideational transfer rather than external political pressure. In their analysis of Germany, Japan and the Republic of Korea, foreign experience served not as a blueprint for institutional replication but as a source of cognitive legitimacy, demonstrating that particular configurations, most notably the social insurance model, were administratively and politically feasible within different national contexts. Japan drew upon Germany to justify its transition from fragmented tax-based provision to an integrated insurance-based system, while Korea subsequently referenced Japan's experience to support the institutional feasibility of its own LTCI scheme.

Viewed in this light, the diffusion of China's LTCI pilot programme may be

understood as a predominantly endogenous process shaped by central–local governance dynamics, yet one situated within a broader global repertoire of LTCI models. International precedents provide conceptual resources that reinforce the plausibility of large-scale institutional reform, even though the actual drivers of expansion remain domestic.

4.3.2 The Perspective of Central-Local Government Relations

The relationship between central and local government is a crucial factor shaping the formulation and implementation of social policy in China. It has long been used in scholarly debates to explain the country's rapid economic growth since the reform era (Huang, 2008; Whiting, 2006; Chan and Shi, 2022). When confronted with new social challenges, the central government often encourages local authorities to experiment autonomously, generating institutional experiences that may subsequently be adopted nationwide (Zhu and Wu, 2018). The pilot programme for LTCI, launched in 2016, represents an important innovation within this distinctive governance framework. While the pilots were introduced under unified central guidelines, the schemes rolled out in individual cities varied considerably in both content and implementation. Moreover, the effectiveness of such policy experiments is not derived solely from decentralisation or spontaneous local initiatives: central authority plays an essential role in stimulating and safeguarding local innovation (Han, 2010a).

This indicates that interactions between the centre and the localities decisively shape the trajectory of policy experimentation.

The piloting of the LTCI scheme is best understood as a form of policy experimentation (Chan and Shi, 2022). This type of ‘experimentation under hierarchy’ has been identified as a distinctive mode of Chinese policymaking (Heilmann, 2008). It is commonly applied in policy areas where the centre has a clear reform ambition but has not yet devised detailed implementation arrangements. The underlying logic is that the most effective practices will be selected from the multitude of local initiatives (Heilmann, 2008). In China, the standard pathway for institutional change typically begins with pilot projects, from which transferable innovations are distilled and later formalised through national legislation and regulation. From an institutionalist perspective, the emergence and persistence of a mechanism reflects long-term processes of social and institutional structuring (Zhou et al., 2025). By contrast, a social experimentation perspective highlights the ways in which the choice or self-selection of pilot sites can shape outcomes, as resource allocation and organisational support tend to tilt in their favour (Liu et al., 2018). From the standpoint of policy design, however, the congruence between the mechanisms of policy formation and the broader socio-political economy may be even more critical (Zhou et al., 2025). Consequently, methods such as randomised controlled trials or strict causal inference are not necessarily superior in

generating workable policy models compared with China's established mode of experimentation (Wang, 2022). More broadly, this approach is a continuation of the reform-era principle of 'crossing the river by feeling the stones' (摸着石头过河) – an incremental, adaptive logic of governance (Zhou et al., 2025). In practice, policy experiments take the form of provisional regulations, pilot reforms, or experimental zones, with the purpose of trialling new arrangements in a limited number of localities in order to anticipate challenges and assess feasibility (Chan and Shi, 2022; Zhou et al., 2025).

Central government directives have been a key driver in the diffusion of the LTCI pilots. Viewed historically, the evolution of the scheme reveals a staged pattern of central-local interaction. Broadly, three phases can be identified: a pre-pilot phase of local government self-exploration (June 2012–June 2016); the first pilot phase under central leadership (July 2016–August 2020); and the second pilot phase of nationwide expansion (from September 2020 onwards).

On the one hand, the 'one province one city' (一省一市) principle (under which each province selects a single major city, typically a prefecture-level city, to conduct the pilot) introduced a distinctly top-down dynamic, particularly in central and western regions (Wu et al., 2022). On the other hand, the guidelines afforded local authorities a degree of discretion and space for innovation (Wu et al., 2022). In terms of division of responsibilities, the centre is primarily in

charge of top-level design, setting the principles, objectives, rules, and regulatory framework; local authorities are then expected to adapt these to their developmental conditions and practical constraints by issuing local regulations and by-laws (Zhou et al., 2025). In terms of financing, the central and local governments must strike a balance: the central treasury supports less developed regions through equalisation funds, thereby mitigating regional disparities in benefit levels (Ni and Linag, 2016), while local governments shoulder the main responsibility for fundraising (Zhou, 2013). This arrangement has meant that some localities, under fiscal pressure, have resorted to lowering benefit standards or delaying implementation, thereby entrenching regional inequalities in welfare provision (Zhou et al., 2025).

Such fiscal imbalances have further fuelled regional competition and local protectionism. On one side, the central government's practice of selecting pilot sites across regions and encouraging differentiated approaches has incentivised localities to compete for model status – for instance, by expanding coverage, raising benefit levels, or developing care-related industries to attract central recognition (Chan and Shi, 2022; Zhou et al., 2025). On the other side, certain cities have used surpluses from their medical insurance funds to sustain LTCI pilots, partly to prevent resources from being reallocated by the centre, which reflects strong local protectionist tendencies (Chan and Shi, 2022). These dynamics have created tensions between central objectives (such as

intergenerational fairness and long-term sustainability) and local strategies shaped by short-term fiscal stress and political performance incentives (Zhou et al., 2025).

Overall, the central government faces a dilemma in LTCI reform: it can either prioritise addressing emerging social needs at the expense of exacerbating regional inequalities, or it can pursue institutional reforms to enhance regional equity, though this would require greater central resource commitment and could constrain its capacity for coordination (Chan and Shi, 2022).

4.3.3 Conceptual Framework of Fiscal Sustainability

In this thesis, fiscal sustainability refers to the government's capacity, at municipal, provincial, and national levels, to support and expand LTCI subsidy policies based on the insured population, without incurring excessive fiscal stress that would necessitate disruptive fiscal adjustments. The following studies have informed, to varying degrees, the quantitative analysis presented in this thesis.

Guillemette and Turner (2017) assess long-term fiscal sustainability in the context of demographic ageing, rising health expenditure, and the increasing pressure of pension systems. Their model offers a theoretical foundation: fiscal rules should ensure that the debt-to-GDP ratio remains stable or declines over

time (Guillemette and Turner, 2017). This thesis similarly focuses on the dynamic balance between future fiscal revenues (general public budget revenues, GPBR) and subsidy-related expenditures (government subsidies provided during the financing stage). Drawing on the cell-based aggregate projection models inspired by Glasby et al. (2020), this thesis forecasts government subsidies and develops a subsidies-to-GPBR ratio as a fiscal pressure indicator to evaluate the fiscal sustainability of China's LTCI pilot system during the financing stage.

While the OECD model by Guillemette and Turner (2017) decomposes pension, healthcare, and LTC expenditures into separate modules driven by exogenous demographic assumptions, this research employs the GM (1,1) grey forecasting model to project the subsidised population (see Chapter Five: Li and Liu (2022); Qi et al. (2024); Liu et al. (2024); Du and Lang (2022)). Although based on a different methodology, this approach likewise represents a structural projection of demographic trends.

Chalk and Hemming (2000) provide an in-depth examination of the government's Present Value Budget Constraint (PVBC), which forms the theoretical basis for assessing fiscal sustainability. While this thesis is primarily empirical, the analytical core centres on whether subsidy expansion might precipitate future fiscal imbalance. The PVBC requires that the government's

current debt be offset by future fiscal surpluses, calculated in present value terms. The thesis's empirical analysis, comparing subsidy expenditure with projected GPBR, constitutes a practical application of this theoretical construct.

Mosca et al. (2017) offer a systematic evaluation of the fiscal and organisational sustainability of LTC systems within the European Union (EU). Although their research focuses on EU countries, the core theoretical challenges (fiscal pressure, demographic ageing, the expansion of services, and funding constraints) are highly relevant to China's subsidy policy framework. Moreover, Mosca et al. (2017) highlight the differing roles and responsibilities of national, regional, and local governments in fiscal arrangements. Similarly, Lundsgaard (2006), adopting a multidimensional perspective on fiscal sustainability, emphasises that the issue is not limited to budgetary balances. Rather, it encompasses the long-term pressures on public expenditure arising from demographic change, particularly ageing, and the intergovernmental distribution of fiscal responsibilities and expenditure pressure. These insights resonate closely with this thesis's focus on assessing fiscal capacity across municipal, provincial, and national tiers of government.

Studies such as those discussed above have provided conceptual inspiration for the methodological design of this thesis, the details of which are elaborated in Chapter Five.

4.4 Summary

This chapter has outlined the theoretical foundation underpinning the thesis. It first reviewed several frequently employed theories in the study of public policy and welfare systems, including evolutionary game theory, demand theory, Maslow's hierarchy of needs, welfare pluralism, and the theory of public service chain. These provide a broad conceptual background for understanding the behavioural, economic, and institutional dimensions of LTCI development.

Subsequently, the chapter introduced the specific theoretical underpinnings of this study. Three interrelated frameworks (fiscal sustainability analysis, policy diffusion theory, and the central-local government relations perspective) form the conceptual core of the thesis. Fiscal sustainability theory offers tools for evaluating the long-term viability of subsidy expansion across government levels, drawing upon forecasting approaches developed by previous researchers. Policy diffusion theory enables an exploration of regional variation and institutional learning during the LTCI pilot implementation. The perspective of central-local government relations (央地关系视角) highlights the institutional dynamics of China's governance system, particularly the interaction between central guidance and local experimentation, which decisively shapes the trajectory of policy design and implementation.

Together, these frameworks provide the analytical foundation and interpretive lens for this investigation. Their integration enables this study to deduce several core propositions: (1) that the dynamic interplay between central policy design and local implementation flexibility would produce significant regional variation in policy instruments while potentially leading to fragmentation in eligibility and benefit standards (addressing research question 1 – hereafter RQ); (2) that the fiscal pressure of government subsidies would vary substantially across different subsidy models (fixed-sum, proportional, mixed) and administrative levels (municipal, provincial, national) when projected using GM (1,1) and cell-based aggregate projection models (addressing RQ2 and RQ3); and (3) that the institutionalisation trajectory of LTCI would be characterised by a hybrid process combining top-down policy diffusion with bottom-up institutional innovation (addressing RQ4). These deductive propositions guide the investigation that follows.

CHAPTER FIVE: METHODOLOGY

5.1 Overview

Chapter Five outlines the methodological framework of this thesis, which is organised around two principal components. The first component employs a structured comparative approach to examine the development of China's long-term care insurance (LTCI) pilot system. This involves a systematic comparison of policy documents from two key phases (the initial pilot phase in 2016 and the expanded pilot phase in 2020) across 29 major pilot cities. The analysis focuses on four core dimensions: financing mechanisms, benefit design, disability assessment, and public-private partnerships (PPPs).

The second component focuses on the fiscal sustainability of government subsidies in the LTCI system under future scenarios of policy expansion to provincial and national levels. This part involves quantitative analysis at three levels of aggregation: municipal (the selected exemplar pilot cities that explicitly incorporate government subsidies in their LTCI financing structure), provincial (the provinces in which these exemplar pilot cities are located), and national (mainland China). It employs two quantitative models: the GM (1,1) grey forecasting model to project the number of government-subsidised insured individuals and general public budget revenues, and 'cell-based' aggregate projection models to estimate future government expenditure on LTCI subsidies during financing process. The detailed design and implementation of these

models will be presented in subsequent sections.

The research aims and corresponding methodological approaches are as follows:

1. To examine the development of China's LTCI pilot system through a structured comparative policy review of the 2016 and 2020 phases across 29 major pilot regions, focusing on four core dimensions: (1) financing mechanism, (2) benefit design, (3) disability assessment, and (4) PPPs. This analysis further considers institutional changes and achievements, as well as the challenges and limitations observed across these dimensions.
2. To assess the fiscal sustainability of government subsidies embedded in the LTCI financing process when scaled up to the municipal, provincial, and national levels under alternative policy scenarios. This involves the integration of the GM (1,1) grey forecasting model with cell-based aggregate projection models, thereby providing a comprehensive quantitative assessment of the medium- to long-term financial viability of LTCI expansion.
3. To evaluate the advantages and disadvantages of different subsidy types (fixed-sum, proportional, and mixed) at the municipal, provincial, and national levels, and to analyse the institutional development of China's LTCI system through the lens of central-local government relations. In addition, drawing on policy diffusion theory, this study considers how lessons from local pilot experiences contribute to the broader understanding of LTCI's

fiscal sustainability and institutionalisation at the national level.

The contribution of this thesis is threefold. First, it maps the institutional evolution across two pilot phases, showing how central directives and local experimentation jointly shaped the development of LTCI. Second, it advances existing research by conducting a multi-level quantitative assessment of fiscal sustainability under alternative subsidy schemes. Third, it offers integrated policy strategies, including independent legislation, diversified financing, service integration and digital governance, to promote long-term equity, efficiency and sustainability.

The current chapter includes four sections. Section 5.2 will detail the design of structured comparative review of LTCI pilot policies. Section 5.3 describes the design of quantitative analysis. Finally, a summary is provided in Section 5.4.

5.2 Structured Comparative Review of LTCI pilot policies

5.2.1 Policy Document Database

To foster discussion and research in the field of LTCI in China, in 2019, Associate Professor Chen from the Renmin University of China led the development and release of the *China Long-Term Care Insurance Pilot Policy Database (CLIP)*. Since then, multiple updated versions have been released.

As of January 2025, the latest version of the database is CLIP 2023. The scope

of policy collection includes LTCI policy documents from the central government of China, two key provinces (Shandong and Jilin), and 29 LTCI pilot regions (49 pilot cities). This database focuses on social insurance-based LTCI. According to the *No.80 document* (Ministry of Human Resources and Social Security of the People's Republic of China, 2016) and the *No.37 document* (National Healthcare Security Administration of China and Ministry of Finance, 2020), LTCI is defined as a social insurance system that collects funds through mutual assistance and collective support to provide financial or service guarantees for the basic care and related medical services of individuals with long-term disabilities (CLIP, 2023). The database does not cover those non-official and non-pilot commercial LTCI documents (CLIP, 2023).

This thesis conducts a structured comparative policy review based on the CLIP (2023) database to examine the current LTCI pilot policies in 29 major pilot cities in China (15 from the first batch and 14 from the second batch). As of 2021, the nationwide LTCI pilot programme encompasses 49 cities. However, the initial pilot phase in 2016 involved 15 major cities, with a further 14 added in the 2020 expansion. This allocation is consistent with the official designations set out in *No.80 document* and *No.37 document*, which specify the composition of the first and second pilot batches (Ministry of Human Resources and Social Security of the People's Republic of China, 2016; National Healthcare Security Administration of China and Ministry of Finance, 2020). In practice, each

province typically designates one principal 'lead city' whose regulatory framework is closely followed by other pilot cities in the same province. For instance, in Jilin Province, Changchun serves as the lead city, while Jilin City, Tonghua, Songyuan, Meihekou, and Hunchun implement substantially the same policy arrangements as supporting cities. On this basis, this study focuses on the lead cities, thereby reducing the analytical sample to 29 cases rather than the full set of 49. This focus on 29 major cities, rather than the full set of 49 pilot cities, is a methodological choice also adopted in other studies, such as Dai et al. (2022), Du and Wang (2022b), and Zhu and Ma (2023).

5.2.2 Comparative Framework

"Comparative public policy research has enormous promise for improving our understanding – not only of policy-making and implementation in other countries, but also of domestic public policy (Dodds, 2013, p. 315)"

If comparison is simply defined as requiring the presence of shared characteristics between units, then theoretically, "there are no limits to comparison" (Caramani, 2009, p. 29). Przeworski and Teune (1970) suggest that the essence of comparison is relatively straightforward: it involves either analysing the same phenomenon across different contexts or examining different phenomena within similar contexts. This approach can yield more profound insights than those obtained through individual case studies

(Przeworski and Teune, 1970).

This thesis adopts a structured comparative policy review to examine the evolution of China's LTCI policy during two key phases: the 2016 initial pilot and the 2020 expansion phase. Rather than comparing countries or macro-level systems, the units of comparison in this review are official policy documents issued at the national and municipal levels for the LTCI pilot. The purpose is to systematically identify differences and continuities in the financing mechanisms, benefit design, disability assessment, and PPPs.

The structured comparative policy review follows a priori categorisation framework informed by established literature on long-term care (LTC) financing (Rodrigues, 2017; Evans-Lacko and Knapp, 2017) and comparative policy analysis (Dodds, 2013; Greve, 2017). The comparison is organised along ten sub-dimensions: financing sources, financing methods, annual funding standards, funding levels, insured population, beneficiaries, benefit limit, benefit level, disability assessment, and PPP arrangements. The method allows for both within-phase and cross-phase comparison, enabling the identification of institutional changes and achievements, and providing evidence to critically examine the challenges and limitations. This approach is suited to China's decentralised pilot structure, where significant inter-city heterogeneity exists due to regional socio-economic and demographic differences. The structured

comparative review helps ensure consistency and comparability across cases while allowing for contextual interpretation.

Evans-Lacko and Knapp (2017) provide a conceptual model for understanding the structure and functioning of a healthcare system (see Figure 11). This figure is an adapted version of the Production of Welfare framework originally developed by Davies and Knapp (1981) and Knapp (1984), as reproduced by Evans-Lacko and Knapp (2017). This framework delineates key components, including: (1) Revenue collection – the sources of funding, such as taxation, social insurance, and out-of-pocket payments; (2) Provider budgets – allocation of collected funds to healthcare providers (e.g., hospitals, community services, care homes); (3) Resource inputs – tangible resources financed through budgets, including personnel, facilities, and medications; (4) Non-resource inputs – contextual factors such as the social environment, staff attitudes, patient history, and personal resilience; (5) Outputs – the healthcare services delivered, including treatments, surgeries, home visits, and residential care; (6) Outcomes – the results of service provision, such as symptom reduction, improved functioning, enhanced quality of life, and greater independence.

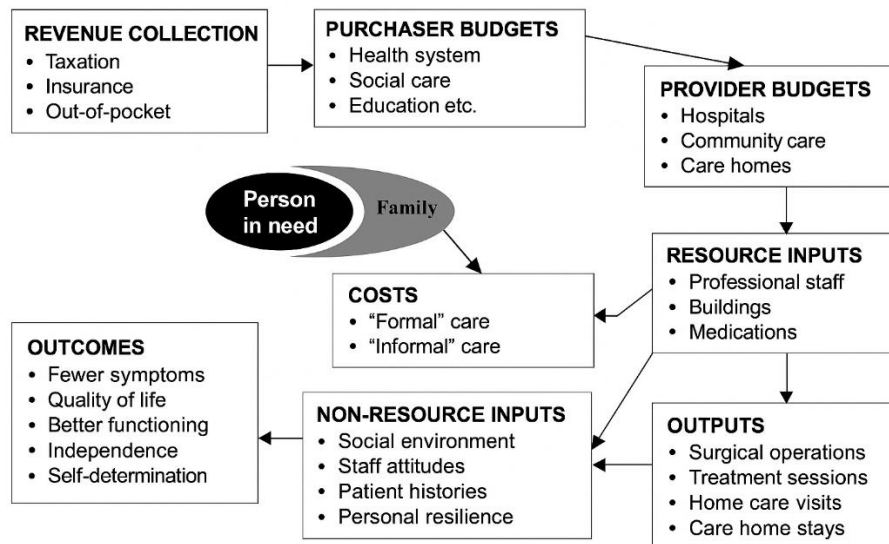


Figure 11 Simple representation of a health system (source: Evans-Lacko and Knapp (2017))

The above model (Figure 11) illustrates the key components of revenue collection, purchaser and provider budgets, inputs (both resource and non-resource), costs, outputs, and eventual outcomes for individuals in need and their families. Building on this structure, the present study reconfigures these elements to reflect the specific institutional and policy context of China's LTCI pilot system.

Accordingly, the framework developed in this chapter (see Figure 12) mirrors the health systems logic but incorporates five interrelated components tailored to LTCI: (1) Financing Mechanism – analogous to revenue collection, focusing on the funding sources and levels involving individuals, employers, and government. (2) Benefit Design – corresponding to purchaser budgets, defining

insured populations, benefit limits, and coverage levels. (3) Disability Assessment – paralleling resource allocation processes, concerned with institutional responsibilities and eligibility evaluations. (4) PPPs – reflecting the role of providers and co-providers, particularly the involvement of commercial insurance companies alongside state actors. (5) Outcomes – comparable to the health system’s endpoints, capturing fiscal affordability, system feasibility, and implementation results.

Through this adaptation, the evaluation framework retains the systemic perspective of the original health system model, while embedding features that are unique to LTCI pilot design and practice in China.

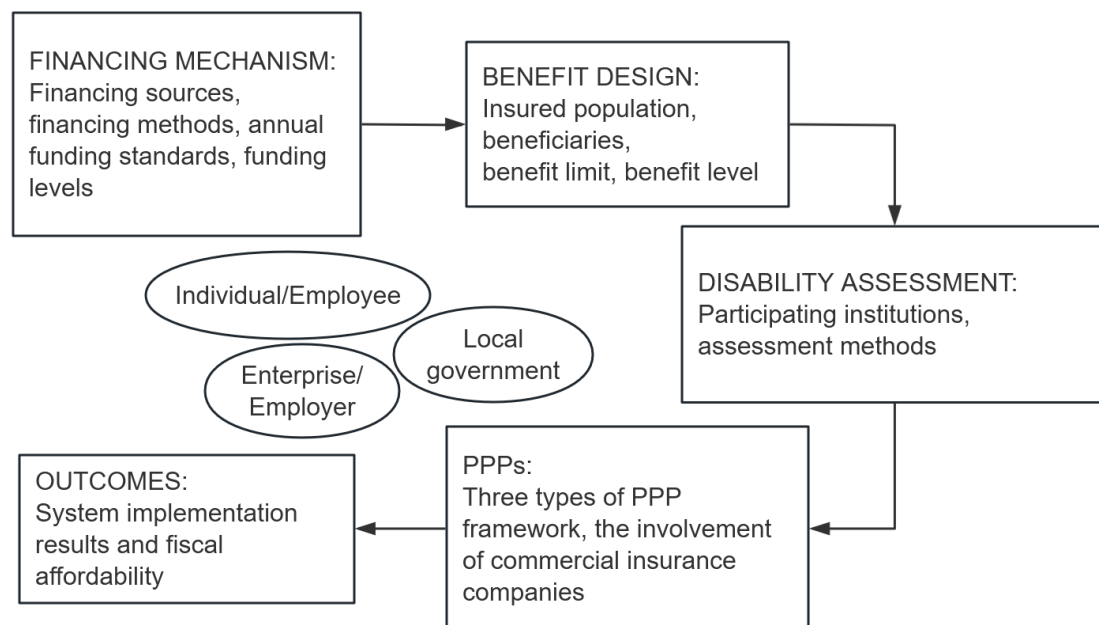


Figure 12 Analytical framework for analysing China's LTCI pilot system

In summary, this structured framework supports a systematic comparison across pilot cities by linking financing mechanisms, delivery structures, and measurable policy outcomes. This component utilises secondary data sources, including books, journal articles, official reports, and policy documents from the China pilot LTCI policy database (CLIP, 2023), to conduct a comprehensive policy comparison.

5.3 Quantitative Analysis

5.3.1 Data Sources

The quantitative analysis section aims to project the future costs of three types of government subsidies (fixed-sum, proportional, and mixed subsidies) within the financing process of LTCI pilot system in China, covering the period until 2035. The goal is to assess the fiscal feasibility and affordability of these subsidy mechanisms in the context of potential national-scale implementation.

The selection of the 2025 to 2035 projection window is grounded in China's long-standing planning tradition. Since 1953, the country has followed the Soviet-style Five-Year Plan (FYP) system for national economic and social development. Each plan spans five years and serves as a strategic policy framework. The LTCI was first introduced during the 12th Five-Year Plan (2011–2015) and the pilot system formally launched in 2016, with its expansion phase initiated during the 13th Five-Year Plan (2016–2020) and continued through the

14th Five-Year Plan (2021–2025). Given that the LTCI policy is still in its pilot stage and may undergo significant adjustments, it would be speculative to forecast too far into the future. Therefore, this study limits its forecasting horizon to two full planning periods, covering 2025–2035, which provides both medium-term insight and policy relevance.

This analysis relies exclusively on secondary data collected from a variety of authoritative and publicly available statistical sources. Data is organised and utilised across three administrative levels:

1. Municipal Level: Data were sourced from official municipal statistical bureau websites (2015–2024), municipal statistical yearbooks (2015–2024), and Statistical Bulletins on National Economic and Social Development of individual cities.
2. Provincial Level: Sources include provincial statistical yearbooks (2015–2024) and data released by provincial-level statistical bureaus over the same period.
3. National Level: Statistical Bulletin on the Development of National Healthcare Security (2018–2023), Statistical Bulletin on the Development of Human Resources and Social Security (2016–2017), Additional datasets published by the National Bureau of Statistics of China.

These data sources provide the basis for forecasting the number of government-subsidised insured individuals and simulating the corresponding

financial expenditures under different policy designs at municipal, provincial, and national levels.

5.3.2 Selection of Exemplar Pilot Cities

This thesis began with a comprehensive review of policy documents from all 29 LTCI major pilot cities (15 pilot cities from the first batch in the initial phase and 14 pilot cities from the second batch in the expansion phase). Among them, a total of 23 cities explicitly mentioned government financial subsidies in either the initial pilot phase or the expansion phase. However, some cities were excluded from the final sample due to insufficient policy detail. For example, although cities such as Shanghai, Ningbo (initial stage), and Anqing (initial stage) acknowledged the presence of government subsidies, the policy documents failed to specify the subsidy ratio, calculation basis, or amount, making them unsuitable for quantitative analysis.

From the remaining policy texts, government subsidies were found to take three primary forms: fixed-sum subsidies, proportional subsidies, mixed subsidies (a combination of fixed and proportional elements) (see Table 5 to 7). Within the proportional and mixed category, pilot cities like Kunming, Chengdu, and Jincheng used the pension income of the insured individuals as the basis for subsidy calculation. However, pension levels in China are determined by multiple factors, such as type of employer before retirement, retirement year

and location, years of contribution, individual contribution level, and accumulated funds, resulting in high individual-level variability (The People's Government of Fenghua District, 2022). For this reason, the municipal average pension level was considered a more suitable proxy for forecasting purposes. Nonetheless, due to the historical evolution of China's pension pooling system (Fang, 2024), which transitioned from municipal-level pooling in the 1990s to provincial pooling in 2000 and was fully implemented nationwide by 2022, several cities lack consistent municipal-level average pension data. Kunming, Jincheng, and Chengdu, in particular, were excluded from the municipal-level quantitative forecasting due to data unavailability but were included in the provincial-level projections.

Additionally, since China's LTCI pilot is integrated with the Basic Medical Insurance System, it primarily covers enrollees of two schemes: Urban Employee Basic Medical Insurance (UEBMI), Urban-Rural Resident Basic Medical Insurance (RBMI) (CLIP, 2023). Although RBMI was formally introduced by the central government in 2016¹⁸, its actual implementation varied across cities, leading to data inconsistencies. For example, Suzhou only started recording RBMI enrolment data from 2020, while Urumqi began doing so in 2018. These gaps affect the comparability and completeness of municipal-

¹⁸ *Opinions on Integrating the Basic Medical Insurance Systems for Urban and Rural Residents* (Guo Fa [2016] No.3)

level datasets. Considering data availability and consistency across levels, the selection of pilot cities for quantitative analysis is as follows: Municipal-level analysis includes 15 cities with complete and clearly defined financial subsidy data. Provincial-level analysis includes 17 cities, accounting for those with incomplete or missing municipal data but with usable province-level aggregates.

Municipal-level: Changchun, Nantong, Suzhou, Ningbo, Anqing, Shangrao, Qingdao, Hohhot, Kaifeng, Qianxinan Buyei and Miao Autonomous Prefecture, Hanzhong, Urumqi, Chengde, Jingmen, Guangzhou.

Provincial-level: Jiling, Jiangsu, Zhejiang, Jiangxi, Anhui, Shandong, Inner Mongolia Autonomous Region, Henan, Guizhou, Shaanxi, Xinjiang Uygur Autonomous Region, Hubei, Guangdong, Beijing, Yunnan, Sichuan, Shanxi Province.

National-level: All 31 provincial-level administrative divisions (the LTCI pilot is implemented in mainland China and therefore excludes Hong Kong, Macao, and Taiwan).

The quantitative analysis of government subsidies in this thesis is divided into two main sections: First, for the historical period from 2016 to 2024, which encompasses both the initial and expansion phases of the LTCI pilot, official data on government subsidy expenditures are not publicly available. Therefore, this study relies on estimation techniques based on related demographic and

financial indicators sourced from official statistical publications. These estimations aim to approximate the scale and structure of fiscal subsidies provided during the pilot period. Second, the thesis conducts forward-looking projections for the period 2025–2035, focusing on the previously selected exemplar pilot cities. The objective is to simulate how the existing subsidy policies (fixed-sum, proportional, and mixed) would perform if continuously implemented over the next decade. This forecasting exercise is designed to assess not only the affordability of each policy type but also its scalability.

To enhance policy relevance and evaluate potential expansion scenarios, the thesis further extends the projections to the provincial and national levels. At the provincial level, projections explore the implications of adopting the selected pilot cities' subsidy policies across their respective entire provinces. This provides insight into regional fiscal sustainability under expanded LTCI coverage. At the national level, simulations examine how these subsidy schemes might function if scaled up to cover the mainland China. This enables a comparative assessment of which type or category of subsidy mechanism may be more suitable for nationwide implementation of LTCI, in terms of both financial feasibility and population coverage.

By combining historical estimation with multilevel forward projections, this quantitative component offers a robust basis for policy recommendations on the

long-term sustainability of government-subsidised LTCI in China.

Table 5 Fixed-sum subsidy policies in major LTCI pilot cities in China

Pilot phase	Pilot cities (first batch)	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number	Pilot phase	Pilot cities	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number
Initial stage	Changchun	No	NA	NA	Chang Fu Ban Fa [2015] No.3	Expansion phase	Changchun	Yes	Subsidies only for enrollees of RBMI	The government provides a subsidy of 2 RMB per person per year (1 RMB from provincial, 1 RMB from municipal/county finance)	Chang Yi Bao Fa [2021] No.45
Initial stage	Shanghai	Yes	RBMI enrollees (60+)	The financing standard for RBMI enrollees (60+) is set slightly lower than that of the UEBMI enrollees, with individuals contributing approximately 15%, and the remaining portion covered by the government. (No specific subsidy ratio or amount is provided)	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	No	NA	NA	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	Yes	enrollees of UEBMI and RBMI	The government provides an annual subsidy of 40 RMB per person for UEBMI and RBMI enrollees.	Opinions on the Establishment of the Basic Long-Term Care Insurance System (Trial Implementation) 2015	Expansion phase	Nantong	Yes	Subsidies only for enrollees of RBMI	The government provides a subsidy of 40 RMB per person per year.	Tong Zheng Fa [2022] No.106
Initial stage	Suzhou	Yes	enrollees of UEBMI and RBMI	In the first phase of the pilot, the individual contribution is temporarily exempted, and the government provides a subsidy of 50 RMB per person per year.	Su Fu [2017] No.77	Expansion phase	Suzhou	No	NA	NA	Su Fu [2022] No.78
Initial stage	Ningbo	Yes	NA	No specific subsidy ratio or amount is provided	Ningbo Long-Term Care Insurance System Pilot Program 2016 (Draft for Comments)	Expansion phase	Ningbo	Yes	Subsidies only for enrollees of RBMI	The government provides a subsidy of 60 RMB per person per year.	Yong Zheng Ban Fa [2022] No.39
Initial stage	Anqing	Yes	NA	No specific subsidy ratio or amount is provided	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Yes	Subsidies for enrollees of UEBMI	The government provides a subsidy of 5 RMB per person per year.	Yi Zheng Ban Mi [2020] No.1
Initial stage	Shangrao	Yes	enrollees of UEBMI	The government provides an annual subsidy of 30 RMB per person.	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Yes	Subsidies for enrollees of RBMI	The government provides a subsidy of 5 RMB per person per year.	Rao Fu Zi [2019] No.33
Initial stage	Qingdao	Yes	NA	The municipal finance transfers 20 million RMB annually from the welfare lottery fund to the urban resident long-term care insurance fund. However, this is not considered general public expenditure and is therefore not addressed in this section.	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Yes	Subsidies only for enrollees of UEBMI	The government provides a subsidy of 30 RMB per person per year.	Qing Zheng Fa [2021] No.6
Initial stage	Shihezi	Yes	Older people (60+) and severely disabled population	Subsidy based on prior-year 60+ and severely disabled population at 40 RMB/person/year.	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	No	NA	NA	Shi Shi Ban Gui Fa [2022] No.4
						Expansion phase	Shijingshan district of Beijing	Yes	Subsidies only for enrollees of RBMI	The government provides a subsidy of 90 RMB per person per year.	Jing Shi Yi Bao Fa [2020] No.16
						Expansion phase	Hohhot	Yes	Subsidies for enrollees of UEBMI and RBMI	The government provides a subsidy of 10 RMB per person per year.	Hu Zheng Ban Fa [2020] No.31
						Expansion phase	Kaifeng	Yes	Subsidies only for enrollees of RBMI	The government provides a subsidy of 10 RMB per person per year.	Bian Zheng [2022] No.10
						Expansion phase	Qianxinan Buyei and Miao Autonomous Prefecture	Yes	Subsidies only for enrollees of RBMI	LTCI funding level is 7 RMB/person/year (20% covered by government). The government provides a subsidy of 1.4 RMB per person per year.	Qian Xi Nan Fu Ban Fa [2022] No.23
						Expansion phase	Hanzhong	Yes	Subsidies for enrollees of UEBMI	The government provides a subsidy of 20 RMB per person per year.	Hanzhong City Long-term Care Insurance Implementation Rules (Trial) 2021
						Expansion phase	Urumqi	Yes	Subsidies only for enrollees of RBMI	The government provides no more than 20 RMB subsidy per person per year.	Wu Zheng Ban Gui[2021]No.1
						Expansion phase	Gannan Tibetan Autonomous Prefecture	Yes	Subsidies for enrollees of UEBMI from Locally-administered government and public institutions	The government provides a subsidy of 120 RMB per person per year.	Zhou Yi Bao Zi [2021]No.143

Table 6 Major LTCl pilot cities in China without government subsidies

Pilot phase	Pilot cities (first batch)	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number	Pilot phase	Pilot cities	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number
Initial stage	Qiqihar	No	NA	NA	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	No	NA	NA	Qi Zheng Ban Gui [2021] No.1
Initial stage	Chongqing	No	NA	NA	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	No	NA	NA	Yu Yi Bao Fa [2021] No.63
						Expansion phase	Panjin	No	NA	NA	Pan Yi Bao Fa [2022] No.15
						Expansion phase	Fuzhou	No	NA	NA	Rong Yi Bao Wen [2021] No.5
						Expansion phase	Xiangtan	No	NA	NA	Tan Yi Bao Fa [2021] No.1
						Expansion phase	Nanning	No	NA	NA	Implementation Opinions on Deepening the Pilot of the Long-Term Care Insurance System in Nanning City (2023)
						Expansion phase	Tianjin	No	NA	NA	Jin Zheng Ban Gui [2020] No.24

Table 7 Proportional and mixed subsidy policies in major LTCl pilot cities in China

Proportional subsidy											
Pilot phase	Pilot cities (first batch)	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number	Pilot phase	Pilot cities	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number
Initial stage	Chengde	Yes	enrollees of UEBMI	The annual subsidy for all enrollees is 0.05% of the total gross wage from the previous year	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	No	NA	NA	Cheng Yi Bao Zi [2021] No.50
Initial stage	Jingmen	Yes	In 2016, it covered only enrollees of UEBMI, and from 2017 onwards, it was expanded to include enrollees of RBMI.	The LTCl funding standard is 0.4% of the per capita disposable income of residents in the city from the previous year, with 37.5% of this amount covered by government subsidies.	Jingmen Long-term Care Insurance Measures (Trial Implementation) 2016	Expansion phase	Jingmen	Yes	Subsidies for enrollees of UEBMI and RBMI	The LTCl funding standard is 0.4% of the per capita disposable income of residents in the city from the previous year, with 37.5% of this amount covered by government subsidies.	Jingmen City Long-term Care Insurance Measures (Trial) 2016
Initial stage	Guangzhou	No	NA	NA	Sui Ren She Gui Zi [2017] No.6	Expansion phase	Guangzhou	Yes	Subsidies only for enrollees of RBMI	The annual subsidy for each student (18+) is 0.03% of annual contribution base for RBMI. The annual subsidy for each resident (18+) is 0.12% of annual contribution base for RBMI.	Sui Yi Bao Gui Zi [2020] No.10
						Expansion phase	Jincheng	Yes	Retirees under UEBMI	Subsidy based on retirees' (including flexible employment retirees) personal retirement salary, at a rate of 0.15%.	Jin Shi Yi Bao Fa [2021] No.5
						Expansion phase	Kunming	Yes	Retirees under UEBMI	Subsidy = UEBMI individual account allocation base for retirees × 0.2% (per person per year) (Starting in 2023, UEBMI individual account allocation base for retirees is equal to the average pension level of the city in the current year).	Kun Zheng Fa [2023] No.5
						Mixed subsidy					
Pilot phase	Pilot cities (first batch)	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number	Pilot phase	Pilot cities	Subsidy Provision?	Subsidised population	Subsidy policy	Policy document number
Initial stage	Chengdu	Yes	Retirees under UEBMI	Subsidy = UEBMI individual account allocation base for retirees × 0.1% (per person/month).	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Yes	Subsidies for retirees enrolled in UEBMI and enrollees of RBMI	The annual subsidy for each retiree under UEBMI = UEBMI individual account allocation base for retirees × 0.01% ×12 (Starting in 2023, UEBMI individual account allocation base for retirees is equal to the average pension level of the city in the current year). The annual subsidy for each adult resident under RBMI is 30 RMB and for each student & child incl. university is 10 RMB.	Cheng Yi Bao Fa [2022] No.10

5.3.3 Projection of Subsidised Insured Population – GM (1,1) Model

In this thesis, the projection of government-subsidised insured individuals until 2035 is carried out using the GM (1,1) grey forecasting model, a classical time series forecasting approach rooted in grey system theory. This model is designed for systems with incomplete information and has proven particularly effective in cases with small datasets or limited historical data, which conditions

that characterise the early-stage implementation of China's LTCl system. The GM (1,1) grey prediction model, introduced by Deng (1982) in the early 1980s, is widely regarded as a reliable method for short- and medium-term forecasting under conditions of limited or incomplete data. By transforming the original sequence through accumulation and differential approximation, the model enhances regularity in time series and is well-suited for systems with uncertainty or poor information structure (Deng, 1982).

The choice of GM (1,1) is theoretically justified and empirically supported by a growing body of applied research. Numerous studies have successfully utilised GM (1,1) to predict trends in social insurance enrolment, fiscal sustainability, and demographic change in China. For instance, Li and Liu (2022) applied the model to forecast participation in basic endowment insurance in Anhui Province, while Qi et al. (2024) demonstrate its accuracy in predicting LTCl enrolment levels in Kunming. In financial contexts, Liu et al. (2024) use GM (1,1) to estimate the accumulated balance of employee medical insurance funds, and Du and Lang (2022) employ the model for provincial-level fund pooling projections under China's integrated healthcare system.

At the municipal level, Zhao (2023) adopts GM (1,1) to forecast participation in a catastrophic disease supplementary insurance scheme, and Ren (2022) applies it to predict coverage among flexible workers in employee medical

insurance. Additionally, another study uses the model to estimate pension fund participation for urban employees in Anhui Province with strong predictive performance (Gao et al., 2017). Across these studies, GM (1,1) has consistently shown strong adaptability to China's social insurance systems, particularly where traditional econometric forecasting techniques are constrained by insufficient or incomplete data.

Given the similarities between these application scenarios and the structure of China's LTCI pilot, particularly in terms of limited historical data, decentralised implementation, and the demand for medium-term forecasting, the GM (1,1) model serves as a methodologically sound and policy-relevant tool for projecting subsidised insured populations at the municipal, provincial, and national levels. The specific steps are as follows:

First step: Original Sequence Definition

Historical insured population data for each pilot city from 2016 to 2024 were collected as the input sequence $x^{(0)} = [x^{(0)}(1), x^{(0)}(2), \dots, x^{(0)}(n)]$, where $x^{(0)}(k)$ denotes the insured population in year k . This is the input for the GM (1,1) model.

Second step: First-Order Accumulated Generating Operation (1-AGO)

To smooth fluctuations and highlight long-term trends, the original sequence was transformed into a monotonically increasing sequence using the first-order

accumulated generating operation (1-AGO):

$$x^{(1)}(k) = \sum_{i=1}^k x^{(0)}(i)$$

This step accumulates the data and reduces randomness, improving model stability.

Third step: Neighbouring Mean Sequence Construction

To approximate the mean value over adjacent intervals, a neighbouring mean sequence $z^{(1)}(k)$ was then constructed using:

$$z^{(1)}(k) = \frac{1}{2}(x^{(1)}(k) + x^{(1)}(k-1)), \quad k = 2, 3, \dots, n$$

This sequence serves as the independent variable in the grey differential equation.

Fourth step: Grey Differential Equation Formulation

The GM (1,1) model builds a first-order linear differential equation in the following form:

$$x^{(0)}(k) + az^{(1)}(k) = b$$

where:

a is the development coefficient (rate of change),

b is the grey input (external influence),

Parameters a and b are estimated using the Least Squares Estimation (LSE) method.

Fifth step: Time Response Function

Once parameters are estimated, the time response function (predictive

equation) of GM (1,1) is derived:

$$\hat{x}^{(1)}(k+1) = (x^{(0)}(1) - \frac{b}{a})e^{-ak} + \frac{b}{a}$$

Sixth step: Inverse Accumulated Generating Operation (IAGO)

The predicted values of the original sequence are then obtained through inverse AGO (IAGO):

$$\hat{x}^{(0)}(k) = \hat{x}^{(1)}(k) - \hat{x}^{(1)}(k-1)$$

This yields the estimated government-subsidised insured individuals for each future year. The forecasting was implemented in Python using a custom *gm11* function.

Model Validation Strategy

To ensure the reliability and accuracy of the GM (1,1) prediction results, a model validation procedure was carried out using both numerical error metrics and posterior tests. The validation process involved a back casting approach, where the model predicted already known historical values, and the forecast results were compared against actual data. The validation process included the following steps (Gao et al., 2017; Liu et al., 2024):

1. **Residual Analysis:** The residuals were computed as the differences between the actual historical insured numbers and the model's predicted values.
2. **Relative Error Calculation:** The relative error for each data point was calculated as:

$$Relative\ Error\ (\%) = \frac{|Real\ Value - Predicted\ Value|}{Real\ Value} * 100$$

This metric reflects the proportional accuracy of each forecasted point.

3. Root Mean Square Error (RMSE): RMSE was used to measure the model's overall prediction accuracy:

$$RMSE = \sqrt{\frac{1}{n} \sum_{i=1}^n (Real_i - Predicted_i)^2}$$

where n denotes the number of observations.

4. Small Error Probability (P Value): The small error probability P measures the proportion of residuals that fall within a defined small error threshold. The threshold was set as $0.6745 * \text{the standard deviation of the real values}$. P is calculated as:

$$P = \frac{\text{Number of } |Residuals| < 0.6745\sigma_{real}}{n}$$

Higher P values (typically above 0.95) indicate better model stability.

5. Posterior Error Ratio (C Value): The posterior error ratio C evaluates the dispersion of prediction errors relative to the original data variation, calculated as:

$$C = \frac{\sigma_{residual}}{\sigma_{real}}$$

where $\sigma_{residual}$ and σ_{real} are the standard deviations of the residuals and real values, respectively. Generally, a C value lower than 0.35 indicates excellent predictive performance.

Evaluation Criteria

The performance of the GM (1,1) model was assessed based on standard statistical indicators commonly used in grey forecasting validation (Gao et al., 2017; Liu et al., 2024). These indicators and their interpretative benchmarks are summarised in Table 8.

Table 8 Criteria for evaluating GM (1,1) forecasting accuracy

	Criterion	Interpretation
Small Error Probability (P)	$P \geq 0.95$ (Excellent)	Represents the proportion of data points with small prediction errors; higher P-values indicate better model consistency.
	$0.80 \leq P < 0.95$ (Good)	
	$0.70 \leq P < 0.80$ (Acceptable)	
	$P < 0.70$ (Poor)	
Posterior Error Ratio (C)	$C \leq 0.35$ (Excellent)	Measures the variability of residuals relative to the original data; lower C-values indicate better model stability.
	$0.35 < C \leq 0.5$ (Good)	
	$0.5 < C \leq 0.65$ (Acceptable)	
	$C > 0.65$ (Poor)	

5.3.4 Projection of Government Subsidies – Cell-based Aggregate Projection Model

The methodology employed in this thesis utilises an aggregate or ‘cell-based’ projections model, which operates by analysing groups of people rather than focusing on singular individuals. This is a projection model co-designed by Raphael Wittenberg (LSE, n.d.) with the objective of forecasting the prevalence of care needs among the older people, along with the corresponding types and quantities of necessary services, and their associated costs. The inaugural application of this model to external inquiries occurred within the context of the Royal Commission on Long-Term Care of the Elderly, established by the Blair government in December 1997 (LSE, n.d.). The Commission was tasked with

investigating how the cost of care should be split between public funds and individuals.

The methodology employed for analysing overall spending projections was that of cell-based simulation, a robust approach commonly utilised for projecting future expenditures, originally formalised in Comas-Herrera et al. (2006) and subsequently extended in Wittenberg et al. (2008a) and Wittenberg et al. (2008b). In addition, the scholarly work titled *Projections of Demand for Social Care for Older People in England* authored by Wittenberg et al. (2008b) holds prominence across diverse topics, frequently cited by researchers. Notably, Cangiano and Shutes (2010) investigated aspects of the British social care system, including its effects on immigrant labour demand, employment conditions for immigrant carers, and the quality of care received by both older individuals and immigrant carers, drawing insights from the aforementioned article. Additionally, Mayhew et al. (2010) also refer to this article in their study of the role of private financial products in LTC systems. Furthermore, Wren et al. (2012) conducted an extensive analysis of this model and explored its application through macro-simulation models in Germany, Spain, and Italy. It is noteworthy that Glasby et al. (2020) employed cell-based aggregate projection models to project potential future spending patterns under various assumptions regarding care incidence and associated costs. This academic discourse has had a significant impact on this thesis's use of these models, providing valuable

insights and inspiration.

To simulate the future financial pressure of different government subsidy mechanisms under the LTCI system, cell-based models are employed. This approach estimates government expenditure by calculating the annual subsidy per individual and multiplying it by the projected number of subsidised LTCI enrollees for each year. The project was implemented in Excel. The model is adapted to reflect the structural differences among three types of subsidy schemes: fixed-sum, proportional, and mixed subsidies. Each scheme follows distinct computational logic, outlined as follows:

1. Fixed-Sum Subsidy

For cities that adopt a fixed-sum subsidy policy, the subsidy amount per enrollee remains constant over time, irrespective of inflation or economic growth. Therefore, the annual government expenditure under this model is calculated as Model (1):

$$ProjectedSubsidy_{jt} = Subsidy_j * Population_{jt}$$

Where:

$Population_{jt}$ = Number of government-

subsidised LTCI enrollees eligible under category j in year t , where $j = 1$ to 5, 1 for enrollees of RBMI, 2 for enrollees of UEBMI, 3 for enrollees of the Basic Medical Insurance (BMI) with unspecified scheme, 4 for Retirees under

UEBMI, 5 for UEBMI enrollees employed in government and public

institutions.

$Subsidy_j$ = Fixed subsidy amount allocated per enrollee in category j , in accordance with local policy regulations.

This formulation assumes that the unit subsidy remains unchanged throughout the forecasting period (2025–2035), consistent with the policy design in fixed-sum cities.

2. Proportional Subsidy

In the proportional subsidy framework, the government subsidy is defined as a percentage of a changing economic base, such as the previous year's total wages, per capita disposable income, or the current year's average pension level. These economic indicators are subject to temporal fluctuations influenced by broader macroeconomic trends. Given this dynamic nature, the model assumes that the unit subsidy increases at the same rate as the underlying economic indicator. To project this change over time, the Compound Annual Growth Rate (CAGR) of the relevant indicator is calculated based on historical data and used as the economic growth rate factor r in the projection model (2):

$$ProjectedSubsidy_{jt} = \frac{LTCIsubsidy_{ji}}{Population_{ji}} * Population_{jt} * (1 + r)^{t-i}$$

Where:

$Population_{jt}$ = Number of government-

subsidised LTCI enrollees eligible under category j in year t .

$LTCIsubsidy_{ji}$ = Baseline subsidy amount per enrollee in category j in the base year i .

j = 1 to 5, 1 for enrollees of RBMI, 2 for enrollees of UEBMI, 3 for enrollees of BMI with unspecified scheme, 4 for retirees under UEBMI, 5 for UEBMI enrollees employed in government and public institutions.

r = Estimated CAGR of the relevant economic indicator.

i = Base year (i.e., the year when the subsidy was initiated).

t = Projection year (e.g., 2025–2035).

This model captures the inflationary and wage-linked characteristics of proportional subsidy schemes and allows for a realistic estimation of future fiscal pressure under evolving economic conditions.

3. Fiscal Affordability Ratio

Glasby et al. (2020) utilised Gross Value Added (GVA) as an indicator of governmental financial capacity and projected the ratio of gross expenditure on adult social care relative to GVA. Their projection highlights the importance of government budgets, particularly economic growth, in assessing the sustainability of the adult social care system. Similarly, this chapter adopts a comparable approach by examining the ratio of subsidies for LTCI enrollees to general public budget revenues. This measure provides insight into the proportion of local government subsidies for LTCI within local general public

budget revenues, enabling an assessment of the affordability and sustainability at different levels (Li, 2020a; Chen et al., 2025). Ultimately, this analysis seeks to determine an appropriate level of financial subsidy for the future nationwide implementation of LTCI.

The data on general public budget revenues (GPBR) is sourced from the municipal statistics bureau, provincial statistics bureau, and National Statistical Yearbooks. Specifically, in the China Statistical Yearbook, general public budget revenue and expenditure are typically reported under three categories: total, central government, and local government. For the purpose of this study, the data classified under the local government category are selected. This choice is based on the fact that LTCI is still in its pilot phase and is primarily implemented under the leadership of local governments. Its funding mainly relies on local fiscal subsidies, as the central government, while providing policy guidance, has not yet established a nationally unified LTCI fund. Consequently, since financial subsidies for the LTCI pilot phase are predominantly borne by local governments, the GPBR indicator is the most appropriate measure for this analysis.

For the projection of GPBR, each region was modelled independently using the GM (1,1) method and region-specific data. No aggregation was performed across cities, and model validation was conducted separately for each case.

The forecasting procedure is consistent with that used for subsidised insured population projections earlier in this chapter. The GM (1,1) model demonstrated strong forecasting performance in the majority of regions. Nevertheless, to ensure the robustness of the results, alternative models (ARIMA, exponential smoothing, and ordinary least squares (OLS)) were applied in regions where GM (1,1) exhibited relatively weaker accuracy (see Chapter Seven).

The equation used to calculate the ratio of subsidies for LTCI enrollees to GPBR is specified as follow:

$$Subsidy2GPBR_{jt} = \frac{ProjectedSubsidy_{jt}}{GPBR_t}$$

Where:

$Subsidy2GPBR_{jt}$ = Total estimated subsidy for LTCI enrollees eligible under category j in year t , where $j = 1$ to 5, 1 for enrollees of RBMI, 2 for enrollees of UEBMI, 3 for enrollees of BMI, 4 for retirees under UEBMI, 5 for UEBMI enrollees employed in government and public institutions.

$GPBR_t$ = General public budget revenues in year t .

This ratio offers a standardised measure to compare LTCI-related fiscal commitments across municipal, provincial, and national level, thereby informing policy discussions on scalable subsidy options.

5.4 Summary

This chapter presented the methodological framework adopted to achieve the

research objectives of this thesis.

First, a structured comparative policy review was conducted to examine the development of China's LTCI pilot system across 29 cities, focusing on the evolution between the 2016 and 2020 pilot phases. Second, the thesis employed two kinds of models and one equation to evaluate the fiscal feasibility of nationwide LTCI expansion. The GM (1,1) grey prediction model was used to project the number of government-subsidised insured individuals and the GPBR from 2025 to 2035, based on municipal, provincial, and national levels demographic trends, historical enrolment data, and historical fiscal revenue data. Then, cell-based aggregate projection models were developed to estimate government expenditure under three types of subsidy policies (fixed-sum, proportional, and mixed subsidies) at the municipal, provincial, and national levels. To further assess fiscal sustainability, the study introduced an equation: the fiscal affordability ratio equation, which calculates the ratio of projected subsidies for eligible enrollees to GPBR. This standardised ratio enables a cross-level comparison of LTCI-related fiscal commitments, thereby informing policy discussions on scalable and affordable subsidy mechanisms.

Overall, these methodological components provide an integrated framework to assess institutional variation, fiscal pressure, and policy scalability for future LTCI reform in China. Building upon this Methodology Chapter, the next chapter

undertakes a structured comparative policy review to examine regional variation in LTCI pilot implementation.

CHAPTER SIX: STRUCTURED COMPARATIVE POLICY REVIEW

6.1 Overview

Based on statistics from the National Health Insurance Administration, after the expansion of the pilot scope, by the end of 2022, the number of insured people in 29 long-term care insurance (LTCI) pilot regions (including 49 cities) across the country reached 170 million, and the number of people enjoying benefits reached 1.208 million (CLIP, 2023). In 2022, the fund income reached RMB 24.08 billion, and the fund expenditure reached RMB 10.44 billion (CLIP, 2023). There are 7,679 designated service institutions for LTCI, with 331,000 nursing service personnel (CLIP, 2023).

According to *China's Long-Term Care Insurance Pilot Development Report (2020)* (Cao and Li, 2020), the design concept of China's LTCI system begins at a low level, meaning it starts with lower coverage and fewer beneficiaries, taking into account factors such as economic development, funding capacity, and demand for protection. The policy aims to gradually increase the level of coverage based on the outcomes of the pilot programmes. For example, during the pilot phase, the insured population and the recipient of the benefit began with enrollees in the Urban Employee Basic Medical Insurance Scheme (UEBMI), focusing on addressing the basic care needs of individuals with severe disabilities, with limited consideration given to qualifying older disabled

individuals and those with severe disabilities. The financing of the system is primarily based on contributions from employers and individuals, with the Social Basic Medical Insurance Scheme fund initially handling the collection and payment. In terms of benefits, the LTCI fund is primarily used to cover the costs of basic care services, with the payment level generally controlled at around 70 per cent of eligible care service expenditure. In practice, this means that the fund covers roughly 70 per cent of approved care costs, with the remainder paid by beneficiaries. The recipients of the benefit, who are diagnosed by medical or rehabilitation institutions with a disability lasting more than six months and who pass the assessment and approval process, are eligible for policy benefits according to the regulations. Regarding administration and management, the *No.37 document* suggested involving non-governmental actors, such as welfare lotteries, commercial insurance companies, welfare agencies etc., in insurance management services to enhance service capacity and efficiency (National Healthcare Security Administration of China and Ministry of Finance, 2020).

This chapter is structured into five sections. Following a brief overview, Sections 6.2 to 6.5 present a structured comparative review of four key dimensions of China's LTCI pilot system: financing mechanism, benefit design, disability assessment, and public-private partnerships (PPPs). The discussion of financing mechanism covers financing sources, financing methods, annual

funding standards, and funding levels. The analysis of benefit design addresses the insured population, beneficiaries, benefit limits, and benefit levels. The section on disability assessment examines participating institutions and assessment methods. The PPPs analysis classifies the 29 major pilot cities according to the extent of commercial insurance company involvement in the LTCl pilot system, distinguishing three models: the government procurement with commercial service model, the government delegation with commercial agency model, and the government subsidy with commercial operation model. Finally, this chapter concludes with a summary.

6.2 Financing Mechanism

The *Annual Report on China's Healthcare Development (2020)* points out that, the financing mechanism is the foundation and focus of the LTCl pilot work. Therefore, the financing mechanism of the pilot cities has become the main basis for distinguishing the differences between the systems, which is mainly reflected in four aspects: financing sources, annual funding standards, funding levels, and financing methods (Zheng and Shen, 2020).

6.2.1 Financing Sources

The initial batch of fifteen pilot cities for China's LTCl scheme has demonstrated a certain degree of differentiation in terms of financing sources (Table 9).

Overall, these can be categorised into three broad models:

First, a model primarily reliant on the Basic Medical Insurance (BMI) fund. In the early stages, several cities (such as Changchun, Qingdao, and Guangzhou) depended heavily on allocations from the BMI fund. This approach facilitates the rapid launch of pilot projects, reduces additional financial pressure on individuals and employers, and simplifies the fundraising mechanism. However, in the longer term, it may exert pressure on the sustainability of the BMI fund (Zhang and Yang, 2019).

Second, a multi-source financing model involving shared responsibility from local government, employers, and individuals. Cities such as Ningbo, Nantong, Suzhou, Shangrao, and Jingmen adopted this approach, which supplements BMI allocations with contributions from employers, individual premiums, and local government budgets. For instance, Ningbo and Nantong assign clear funding responsibilities to both employers and individuals while also securing local government contributions, thereby strengthening the fund's stability and resilience to risk.

Third, a government-led and socially supplemented model. In their expansion phases, cities including Changchun, Anqing, and Qingdao increased the role of local government financing while actively integrating funds from social sources (such as corporate donations, charitable contributions, and welfare lottery

proceeds). This structure emphasises the leading role of government funding while encouraging participation from broader societal actors, thereby preserving the public welfare nature of the LTCI fund and increasing its operational flexibility.

As for the overall trend, in the initial phase, most pilot cities relied heavily on the BMI fund. However, as the expansion phase progressed, there was a marked shift towards diversified financing, with growing proportions derived from employer and individual contributions, local government allocations, and social funding. This evolution reflects a transition in funding strategy from an emphasis on 'rapid implementation' to one centred on 'sustainable operation'. The objective is to balance coverage and social impact with long-term fiscal equilibrium and sustainability of the fund.

Table 9 Financing sources of LTCI pilot cities (the first batch)

Pilot phrase	Pilot Cities	Financing Sources	Policy Document Number	Pilot phrase	Pilot Cities	Financing Sources	Policy Document Number
Initial stage	Chengde	Individuals, Local government, Basic medical insurance	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	Employers, Individuals, Basic medical insurance	Cheng Yi Bao Zi [2021] No.50
Initial stage	Changchun	Basic medical insurance	Chang Fu Ban Fa [2015] No.3, Chang Ren She [2015] No.21	Expansion phase	Changchun	Employers, Individuals, Basic medical insurance, Special Financial subsidies, Funding from Social Sources	Ji Yi Bao Lian [2021] No.7
Initial stage	Qiqihar	Individuals, Basic medical insurance	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	Employers, Individuals, Basic medical insurance	Qi Zheng Ban Gui [2021] No.1
Initial stage	Shanghai	Individuals, Employers, Local government	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	Employers, Individuals, Basic medical insurance	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	Individuals, Basic medical insurance, Local government	Opinions on Establishing the Basic Care Insurance System (Trial) 2015	Expansion phase	Nantong	Employers, Individuals, Basic medical insurance, Local government	Tong Zheng Fa [2022] No.106
Initial stage	Suzhou	Individuals, Local government, Basic medical insurance	Su Fu [2017] No.77	Expansion phase	Suzhou	Employers, Individuals, Basic medical insurance	Su Fu [2022] No.78
Initial stage	Ningbo	Employers, Individuals, Local government	Ningbo City Pilot Plan for Long-term Care Insurance System 2016 (Draft for Public Comment)	Expansion phase	Ningbo	Employers, Individuals, Basic medical insurance, Local government	Yong Zheng Ban Fa [2022] No. 39
Initial stage	Anqing	Individuals, Basic medical insurance, Local government	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Employers, Individuals, Basic medical insurance, Local government, and Donations from Enterprises, organisations, and Charitable Institutions	Yi Zheng Ban Mi [2020] No.1
Initial stage	Shangrao	Individuals, Basic medical insurance, Local government	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Employers, Individuals, Basic medical insurance, Local government	Rao Fu Zi [2019] No.33
Initial stage	Qingdao	Basic medical insurance, Local government	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Employers, Individuals, Basic medical insurance, Local government, Welfare Lottery Subsidy Funds, Social donation funds	Qing Zheng Fa [2021] No.6
Initial stage	Jingmen	Individuals, Basic medical insurance, Local government	Jingmen City Long-term Care Insurance Measures (Trial) 2016	Expansion phase	Jingmen	Individuals, Basic medical insurance, Local government	Jingmen City Long-term Care Insurance Measures (Trial) 2016
Initial stage	Guangzhou	Basic medical insurance	Sui Ren She Gui Zi [2017] No.6	Expansion phase	Guangzhou	Employers, Individuals, Local government	Sui Yi Bao Gui Zi [2020] No.10
Initial stage	Chongqing	Individuals, Basic medical insurance	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	Employers, Individuals, Basic medical insurance	Yu Yi Bao Fa [2021] No.63
Initial stage	Chengdu	Basic medical insurance, Local government	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Employers, Individuals, Basic medical insurance, Local government	Cheng Yi Bao Fa [2022] No.10
Initial stage	Shihezi	Individuals, Employers, Basic medical insurance	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	Individuals, Basic medical insurance	Shi Shi Ban Gui Fa [2022] No.4

As shown in Table 10, the second batch of 14 pilot cities exhibits a pronounced trend towards diversification in funding sources, albeit with varying degrees of difference:

First, common core sources. Almost all cities include employer contributions, individual contributions, and basic medical insurance funds as their core sources. These constitute the fundamental financial structure underpinning the

entire LTCI pilot scheme.

Second, variation in the degree of local government participation. In most cities (e.g., Shijingshan District, Jincheng, Hohhot, Kaifeng, Qianxinan, Hanzhong, Urumqi, and the Gannan Tibetan Autonomous Prefecture), explicit fiscal input from local governments is specified (see Section 6.2.3). A minority of cities (e.g., Tianjin, Panjin, Fuzhou, Xiangtan, and Nanning) do not particularly emphasise local government funding in policy documents, relying more heavily on employer, individual, and medical insurance fund contributions.

Third, the extent of incorporating social donations and charitable funds. Some cities (Jincheng, Hohhot, Qianxinan, Kunming, Urumqi, and Gannan) have introduced social donation funds, thereby enhancing the diversity of funding sources. In certain cases, additional public welfare funds from welfare lotteries are incorporated (as in Kunming), while Gannan goes further by introducing earmarked funds such as the Civil Affairs Welfare Lottery Fund and the Disability Security Fund, making it the city with the highest degree of social welfare funding participation (CLIP, 2023).

Fourth, distinctive models, like high charitable fund participation and strong government leadership. The models in Kunming and Gannan are relatively complex, involving multiple types of earmarked social funds, reflecting a high

level of social engagement. In contrast, in Hanzhong and Kaifeng, the emphasis is placed on the fiscal responsibility of the government, maintaining a leading role for public funding while still pursuing diversification (CLIP, 2023).

Table 10 Financing sources of LTCI pilot cities (the second batch)

Pilot phase	Pilot Cities	Financing Sources	Policy Document Number
Expansion phase	Shijingshan district of Beijing	Employers, Individuals, Basic medical insurance, Local government	Jing Shi Yi Bao Fa [2020] No.16
Expansion phase	Tianjin	Employers, Individuals, Basic medical insurance	Jin Zheng Ban Gui [2020] No.24
Expansion phase	Jincheng	Employers, Individuals, Basic medical insurance, Local government, Social donation funds	Jin Shi Yi Bao Fa [2021] No.5
Expansion phase	Hohhot	Employers, Individuals, Basic medical insurance, Local government, Social donation funds	Hu Zheng Ban Fa [2020] No.31
Expansion phase	Panjin	Employers, Individuals, Basic medical insurance	Pan Yi Bao Fa [2022] No.15
Expansion phase	Fuzhou	Employers, Individuals, Basic medical insurance	Rong Yi Bao Wen [2021] No.5
Expansion phase	Kaifeng	Employers, Individuals, Basic medical insurance, Local government	Bian Zheng [2020] No.36
Expansion phase	Xiangtan	Employers, Individuals, Basic medical insurance	Tan Yi Bao Fa [2021] No.1
Expansion phase	Nanning	Employers, Individuals, Basic medical insurance	Nan Fu Gui [2021] No.3, Implementation Opinions on Deepening the Pilot of the Long-Term Care Insurance System in Nanning City (2023)
Expansion phase	Qianxinan Buyei and Miao Autonomous	Employers, Individuals, Basic medical insurance, Local government, Social donation funds	Qian Xi Nan Fu Ban Fa [2022] No.23
Expansion phase	Kunming	Employers, Individuals, Basic medical insurance, Local government, Welfare Lottery Subsidy Funds, Social donation funds	Kun Zheng Fa [2023] No.5
Expansion phase	Hanzhong	Employers, Individuals, Basic medical insurance, Local government	Hanzhong City Long-Term Care Insurance Implementation Rules (Trial)
Expansion phase	Urumqi	Employers, Individuals, Basic medical insurance, Local government, Social donation funds	Wu Zheng Ban Gui [2021] No.1
Expansion phase	Gannan Tibetan Autonomous Prefecture	Employers, Individuals, Local government, Civil Affairs Welfare Lottery, Disability Protection Fund, Social donation funds	Zhou Yi Bao Zi [2021] No.143

Regarding the comparison between the expanded first batch and the second batch of pilot cities (Table 9 and 10), the differences are primarily reflected in four dimensions: the degree of diversification in funding sources, the institutionalisation of local fiscal involvement, the incorporation of social funds, and the trajectory of policy evolution.

First, even after expansion, a small number of first-batch pilot cities (e.g., Chengde and Chongqing) retained relatively limited financing channels, relying mainly on the combination of medical insurance funds with individual and employer contributions. By contrast, in the second batch, almost all cities supplemented medical insurance funds, employers, and individual contributions with additional local government fiscal allocations, and a substantial proportion also incorporated social donations and charitable funds. The overall level of diversification was thus generally higher than in the first batch.

Second, local fiscal participation in the first batch was inconsistent, with some cities not clearly stipulating fiscal funding responsibilities. In the second batch, however, most policy documents explicitly defined the responsibility of local government to provide funding, indicating an increased degree of institutionalisation.

Third, in the first batch, the number of cities introducing social funds (e.g., public welfare funds or donations) was limited (e.g., Qingdao). In the second batch, social funding participation increased markedly, especially in cases such as Kunming and Gannan, where a tripartite funding structure of government–market–society was established.

Fourth, from the first batch's initial stage of 'medical insurance fund-led and simplified financing' to the expansion stage's 'diversification trials', and further to the second batch's 'institutionalised diversification', it is evident that the national approach to LTCI financing has gradually strengthened fiscal responsibility and societal participation, thereby shaping a more stable and sustainable funding structure.

6.2.2 Financing Methods

From the perspective of financing methods, the financing of China's LTCI pilot system can be categorised into three types: fixed amount financing, proportional financing, and mixed financing (Du and Wang, 2022b).

Fixed amount financing refers to paying a fixed amount, with a uniform financing standard for each individual. This method is simple, convenient, and easy to calculate (Liu and Wang, 2020). In certain cases, fixed amount contributions are applicable to workers whose income does not exceed a certain level, in

order to help them formalise and expand the coverage of social security (including pensions and, in some cases, health insurance) (Calligaro and Cetrangolo, 2023). Because the contribution is a fixed amount, any change is immediately noticeable to the public, making them more likely to react strongly. When the system faces risks such as population ageing, diseases, disasters, and economic instability, increasing the payment amount becomes more challenging (Cao and Li, 2020). The fixed-amount financing approach faces challenges of reverse adjustment in financing pressure among urban and rural populations, high- and low-income groups, and underdeveloped and developed regions (Li and Zhang, 2021). This occurs because regions or groups with lower economic capacity are often required to contribute the same absolute amount as those with higher capacity, despite having greater social security needs and fewer local resources to meet them. Consequently, this approach often results in insufficient financing capacity and inadequate benefit levels. Additionally, it creates an imbalance in the financing pressure between individuals and the government, placing a disproportionately heavy financial pressure on government subsidies (Li and Zhang, 2021; Dai, 2024).

In contrast, proportional financing is based on the insured person's basic medical insurance fund, previous year's total wages, or per capita disposable income, which allows for a more realistic approach, fully considering the economic development level of each pilot region (Liu and Wang, 2020). Dai

(2024) thinks that the transition from a fixed-amount financing system to a proportional financing system incorporates an automatic adjustment mechanism in the funding process. This transition or this mechanism not only ensures fairer distribution of the financing pressure, improves the overall financing level, and addresses the issue of inadequate coverage in the basic medical insurance for residents, but also helps to narrow the gap between employee medical insurance and other systems (Li and Zhang, 2021). Additionally, it aids in balancing the financial pressure between the government and individuals (Li and Zhang, 2021). Furthermore, Tables 11 and 12 show that proportional financing is the second most used method, chosen by 9 pilot cities. However, due to the uncertainty of long-term care (LTC) risks and the varying wage or income bases of individuals, determining the financing ratio can be challenging (Cao and Li, 2020; Zheng and Shen, 2020).

Mixed financing applies different financing methods and standards to various categories of insured individuals, thereby taking into account, to some extent, the differing economic capacities and needs of each group. However, the *China Long-Term Care Insurance Pilot Development Report (2020)* points out that, in practice, the implementation of mixed financing is relatively complex (Cao and Li, 2020). The coexistence of multiple financing standards across different groups and regions can lead to inconsistency and fragmentation in contribution rules. Such disparities may undermine the perceived fairness of the system,

especially if similar individuals are treated differently simply because they fall under different categories or live in different areas, thereby increasing the potential for social dissatisfaction and conflict.

A comparison of the financing methods adopted by the first batch of 15 pilot cities during the initial and expansion phases (Table 11) reveals that most cities maintained a high degree of consistency across the two stages, reflecting the stability and sustainability of the institutional design. Chengde, Shanghai, and Jingmen employed proportional financing in both phases, linking contribution amounts to income or the contribution base, thereby enabling the fund size to grow in tandem with the economic level. Similarly, Qiqihar, Suzhou, Anqing, Shangrao, Chongqing, and Shihezi consistently adopted fixed-amount financing, a model that is straightforward to implement, with standardised amounts facilitating management, though requiring periodic adjustment in line with changes in prices and service costs.

At the same time, a small number of cities adjusted their financing approach during the expansion phase to better balance equity with institutional flexibility. Nantong and Chengdu shifted from fixed-amount financing and proportional financing in the initial phase to mixed financing, combining the advantages of both proportional and fixed-amount models. Ningbo moved from proportional to fixed-amount financing, possibly to simplify administration and reduce

contribution disparities between different income groups. Qingdao transitioned from proportional to mixed financing, enhancing institutional adaptability. These changes suggest that, while the overall financing patterns remained relatively stable, the expansion phase saw certain cities, building upon institutional maturity, begin to explore hybrid arrangements better suited to local economic conditions and administrative requirements.

Table 11 Financing methods of LTCI pilot cities (the first batch)

Pilot phrase	Pilot Cities	Financing Methods	Policy Document Number	Pilot phrase	Pilot Cities	Financing Methods	Policy Document Number
Initial stage	Chengde	Proportional financing	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	Proportional financing	Cheng Yi Bao Zi [2021] No.50
Initial stage	Changchun	Mixed financing	Chang Fu Ban Fa [2015] No.3, Chang	Expansion phase	Changchun	Mixed financing	Ji Yi Bao Lian [2021] No.7
Initial stage	Qiqihar	Fixed amount financing	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	Fixed amount financing	Qi Zheng Ban Gui [2021] No.1
Initial stage	Shanghai	Proportional financing	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	Proportional financing	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	Fixed amount financing	Opinions on Establishing the Basic Care Insurance	Expansion phase	Nantong	Mixed financing	Tong Zheng Fa [2022] No.106
Initial stage	Suzhou	Fixed amount financing	Su Fu [2017] No.77	Expansion phase	Suzhou	Fixed amount financing	Su Fu [2022] No.78
Initial stage	Ningbo	Proportional financing	Ningbo City Pilot Plan for Long-Term Care Insurance System	Expansion phase	Ningbo	Fixed amount financing	Yong Zheng Ban Fa [2022] No. 39
Initial stage	Anqing	Fixed amount financing	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Fixed amount financing	Yi Zheng Ban Mi [2020] No.1
Initial stage	Shangrao	Fixed amount financing	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Fixed amount financing	Rao Fu Zi [2019] No.33
Initial stage	Qingdao	Proportional financing	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Mixed financing	Qing Zheng Fa [2021] No.6
Initial stage	Jingmen	Proportional financing	Jingmen City Long-Term Care Insurance Measures (Trial) 2016	Expansion phase	Jingmen	Proportional financing	Jingmen City Long-Term Care Insurance Measures (Trial) 2016
Initial stage	Guangzhou	Fixed amount financing	Sui Ren She Gui Zi [2017] No.6	Expansion phase	Guangzhou	Proportional financing	Sui Yi Bao Gui Zi [2020] No.10
Initial stage	Chongqing	Fixed amount financing	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	Fixed amount financing	Yu Yi Bao Fa [2021] No.63
Initial stage	Chengdu	Proportional financing	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Mixed financing	Cheng Yi Bao Fa [2022] No.10
Initial stage	Shihezi	Fixed amount financing	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	Fixed amount financing	Shi Shi Ban Gui Fa [2022] No.4

From the perspective of financing methods in the second batch of pilot cities (Table 12), the overall distribution presents a pattern of ‘fixed-amount financing as the main approach, proportional financing as supplementary, and mixed financing being relatively rare’. Among the 14 cities in the second batch, fixed-amount financing remained dominant, adopted by seven cities (Shijingshan District in Beijing, Tianjin, Panjin, Kaifeng, Qianxinan, Hanzhong, and Gannan) accounting for more than half. Proportional financing was employed in five cities (Jincheng, Fuzhou, Xiangtan, Nanning, and Kunming) while mixed financing appeared in only two cities, Hohhot and Urumqi.

Table 12 Financing methods of LTCI pilot cities (the second batch)

Pilot phase	Pilot Cities	Financing Methods	Policy Document Number
Expansion phase	Shijingshan district of Beijing	Fixed amount financing	Jing Shi Yi Bao Fa [2020] No.16
Expansion phase	Tianjin	Fixed amount financing	Jin Zheng Ban Gui [2020] No.24
Expansion phase	Jincheng	Proportional financing	Jin Shi Yi Bao Fa [2021] No.5
Expansion phase	Hohhot	Mixed financing	Hu Zheng Ban Fa [2020] No.31
Expansion phase	Panjin	Fixed amount financing	Pan Yi Bao Fa [2022] No.15
Expansion phase	Fuzhou	Proportional financing	Rong Yi Bao Wen [2021] No.5
Expansion phase	Kaifeng	Fixed amount financing	Bian Zheng [2020] No.36
Expansion phase	Xiangtan	Proportional financing	Tan Yi Bao Fa [2021] No.1
Expansion phase	Nanning	Proportional financing	Nan Fu Gui [2021] No.3, Implementation Opinions on Deepening the Pilot of the Long-Term Care Insurance System in Nanning City (2023)
Expansion phase	Qianxinan Buyei and Miao Autonomous Prefecture	Fixed amount financing	Qian Xi Nan Fu Ban Fa [2022] No.23
Expansion phase	Kunming	Proportional financing	Kun Zheng Fa [2023] No.5
Expansion phase	Hanzhong	Fixed amount financing	Hanzhong City Long-Term Care Insurance Implementation Rules (Trial)
Expansion phase	Urumqi	Mixed financing	Wu Zheng Ban Gui [2021] No.1
Expansion phase	Gannan Tibetan Autonomous Prefecture	Fixed amount financing	Zhou Yi Bao Zi [2021] No.143

Considering the distribution of financing methods across both batches of LTCI pilot cities, the first batch displayed a relatively high level of experimentation and diversity, with fixed-amount, proportional, and mixed financing coexisting in relatively balanced proportions. Notably, mixed financing accounted for nearly one-third of cases, reflecting local governments' attempts to balance equity with administrative feasibility. In contrast, the financing structure in the second batch became markedly more uniform, with fixed-amount and proportional financing jointly dominating and the mixed model significantly reduced, indicating a tendency towards standardisation and simplification of institutional types in the central government's approach to pilot implementation.

From a spatial perspective, economically developed eastern coastal areas and certain central cities tended to adopt income-linked proportional financing to enhance the fairness and sustainability of the system. Conversely, western ethnic minority regions, the north-east, and some fiscally constrained small- to medium-sized cities were more inclined to employ the fixed-amount model, ensuring simplicity and fiscal controllability. This regional differentiation was evident in both batches, although in the second batch the adoption of proportional financing expanded in southern and growth-oriented cities, suggesting a gradual policy shift towards encouraging financing structures with stronger redistributive functions across regions. Overall, the distribution of

financing instruments in the first batch's expansion phase was more balanced and exploratory, whereas the second batch, from its inception, demonstrated a preference for the more cautious and unified fixed-amount approach, with the introduction of mixed financing applied more conservatively.

6.2.3 Annual Funding Standard and Funding Level

How the funds were raised and who bore the pressure raised key issues about equity, as reflected in global health financing policy frameworks, including the World Health Organisation's *Health Financing Progress Matrix: Country Assessment Guide* (WHO, 2020), which emphasises 'equitable financing' and the need to raise health system funds in an 'equitable' manner, in line with the policy statements of many countries. This goal varies in applicability across different countries and time periods (WHO, 2020). According to the way it is distributed relative to ability to pay, it can be classified as progressive, proportional, or regressive. Progressivity means that the financial pressure (as a percentage of income) for wealthier individuals is higher than for poorer individuals; regressivity means that the pressure (as a percentage of income) for poorer individuals is higher than for wealthier individuals; and proportionality means that the pressure is the same across all income levels (WHO, 2020).

In China, the progressivity of health insurance varies across regions. Basic Medical Insurance in cities and counties is progressive, while the New Rural

Cooperative Medical Care System in towns and villages is regressive (Luyten and Tubeuf, 2025). The main reason for this disparity lies in the premium-setting policy. During China's health reform, the priority was to rapidly expand coverage and include the uninsured in the insurance programme (Luyten and Tubeuf, 2025). However, fiscal constraints meant that it was not feasible to extend the progressive, income-based contribution model used in urban schemes to rural areas. Policymakers therefore adopted a uniform flat-rate premium in rural schemes as a pragmatic approach to accelerate enrolment, even though this did not take into account individuals' ability to pay (Luyten and Tubeuf, 2025). As a result, poorer rural residents contributed relatively more in proportion to their income, creating inequity in financing. By contrast, urban scheme participants paid premiums proportional to their income, ensuring greater vertical equity in the system (Luyten and Tubeuf, 2025).

While inequities have arisen in some health insurance schemes due to uniform premium-setting, other social insurance pilots (such as LTCI) have incorporated differentiated contribution standards to address equity concerns. Similarly, while the financing standards and levels for LTCI vary across cities, considerations of equity are evident in the pilot process (Dai, 2024). From Table 13, it can be observed that in China's first batch of LTCI pilot cities, both the annual funding standards and funding levels underwent notable changes between the initial stage in 2016 and the expansion stage in 2020.

In the initial stage, financing arrangements generally relied on individual and employer contributions, supplemented by transfers from the surplus of the UEBMI fund, with some cities providing limited fiscal subsidies. However, in the actual implementation process, the individual contribution portion is mostly transferred and paid by the fund balance. Even in cities where transfer payments are not made, the amount of individual contributions is relatively low. For example, in Qiqihar during the initial stage, the funding came entirely from the BMI fund: it contributed RMB 30 per person per year and also covered the individual's share of RMB 30 from the UEBMI surplus; In Anqing, the total premium of RMB 30 per person per year consisted of RMB 20 from the medical pooling fund surplus and a personal contribution of RMB 10. For proportional financing models, the individual contribution rate of the proportional financing model is mostly concentrated between 0.1 per cent and 0.3 per cent of the average salary/pension or per capita disposable income of the previous year (a relatively low level within China's social insurance system) indicating that the start-up phase was more of a 'trial run' than a full-scale rollout.

By the 2020 expansion stage, funding standards had risen significantly and displayed greater diversification and refinement. Some cities that did not specify their funding levels in documentation during the initial phase had done so by the expansion phase (see the continuation of Table 13 for examples such as

Qingdao and Anqing). Most cities not only increased fixed contribution amounts but also introduced higher proportional rates based on wages or income.

During the expansion phase, for instance, Chengdu required employees to contribute between 0.31 per cent and 0.51 per cent of their wage base, while residents paid between RMB 20 and 55 per person. Shihezi raised the premium for residents enrolled in the Urban-Rural Medical Insurance (RBMI) scheme from RMB 24 to RMB 50 per person per year. Qiqihar increased individual contributions from RMB 30 to RMB 50 per person annually, while maintaining a dual-track financing mechanism combining fiscal subsidies with transfers from the medical insurance fund. Compared to the initial phase, the role of government funding in the medical insurance financing structure strengthened significantly, with some cities implementing differentiated subsidy rates for specific groups, such as full subsidies for low-income or vulnerable populations. However, a few cities retained their original financing standards. Nantong, for example, continued to set individual contributions at RMB 30. Meanwhile, certain cities that lowered their funding levels did so in conjunction with changes to financing methods. Chongqing, for instance, shifted to a proportional contribution model. Although superficially appearing to reduce the funding level, this approach allows revenue to adjust in line with economic development, potentially offering a better fit for local economic conditions.

In addition, differentiated funding standards were introduced in the expansion stage according to population groups. In the early period, most cities made little distinction between employees, retirees, and urban or rural residents. In the expansion stage, however, contributions were stratified by employment status, age, and household registration type. For example, Ningbo, Guangzhou, and Chengdu set different contribution amounts for enterprise employees, residents, and retirees, while also stipulating the government's matching proportion. This differentiated design reflects both considerations of equity and payment capacity and helps ensure the long-term sustainability of the system.

Overall, between 2016 and 2020, the funding levels of LTCI pilot cities increased significantly, the role of government responsibility and institutional guarantees was continuously strengthened, funding sources became increasingly diversified, and contribution standards were more precisely tiered. These changes indicate that the policy has moved from its initial exploratory stage towards institutionalisation and standardisation, beginning to balance funding adequacy with equity in contributions, and laying a practical foundation for the nationwide rollout of LTCI.

Table 13 The annual funding standards and funding levels of LTCI pilot cities (the first batch)

Pilot phrase	Pilot Cities	Annual Funding Standard	Funding Level	Policy Document Number	Pilot phrase	Pilot Cities	Annual Funding Standard	Funding Level	Policy Document Number
Initial stage	Chengde	Personal 0.15%, government subsidy 0.05%, urban employee medical fund 0.2%. Government subsidy: city level by municipal finance, county/district by local finance.	0.4% of last year's total wages of insured persons (incl. retirees)	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	The employer contributes 0.1%, and the individual contributes 0.1%, both of which are allocated from the basic medical insurance fund	0.2% of the total annual salary of the individual (including retirees)	Cheng Yi Bao Zi [2021] No.50
Initial stage	Changchun	UEBMI: For combined account insurance, transfer 0.2% from personal account and 0.3% from pooling fund, based on monthly wage base; for inpatient pooling insurance, transfer 0.5% from pooling fund. RBMI: Transfer RMB 30/person/year from pooling fund; one-off 10% from accumulated surplus as start-up capital.	Not specified in document	Chang Fu Ban Fa [2015] no.3, Chang Ren She [2015] No.21	Expansion phase	Changchun	Urban employees: Employer 0.1%, Individual 0.1%. Rural and urban residents: Individual 10 RMB, Provincial subsidy 1 RMB, Municipal and county subsidy 1 RMB. Flexible employment workers: enrollees of UEBMI transfer 0.1%, Individual 0.1%; enrollees of RBMI: Individual 10 RMB, Provincial subsidy 1 RMB, Municipal and county subsidy 1 RMB. Red Cross subsidy for eligible disadvantaged residents 5 RMB.	Employees: 0.2% of the medical insurance contribution base; Residents: 12 RMB per person per year	Ji Yi Bao Lian [2021] No.7
Initial stage	Qiqihar	RMB 60/person/year (RMB 30 personal, RMB 30 medical insurance, both from medical insurance transfers)	About 1.5% of last year's average monthly wage of on-post employees published by the municipal statistics bureau	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	Employer: 50 RMB, Individual: 50 RMB (allocated from the medical insurance fund; self-paid if no personal account	100 RMB per person per year	Qi Zheng Ban Gui [2021] No.1
Initial stage	Shanghai	UEBMI: Employer pays 1% of total wage base for LTCI; active staff pay 0.1% of own wage base, waived for pilot stage. Retirees pay none. RBMI (60+): Per capita rate slightly below Category 1; personal share about 15% of total, remainder split 1:1 by city/district finance.	Not specified in document	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	Medical insurance fund allocation: For UEBMI enrollees, 0.5% of the employer's contribution base is allocated. For RBMI enrollees aged 60 and above, policies are set by the municipal medical insurance and finance bureaus.	0.5% of the employer's medical insurance contribution base	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	RMB 100/person/year (RMB 30 personal, RMB 30 medical insurance, RMB 40 govt subsidy)	0.3% of last year's per capita disposable income of urban residents in this city	Opinions on Establishing the Basic Care Insurance System (Trial) 2015	Expansion phase	Nantong	Individual: 30 RMB, transferred from total medical insurance funding (3% for employees, 1.5% for residents). Government subsidy: 40 RMB (not applicable to employees)	0.3% of last year's per capita disposable income of urban residents (provisionally set at 100 RMB per person per year)	Tong Zheng Fa [2022] No.106
Initial stage	Suzhou	Pilot phase 1: Personal payment waived; govt subsidy RMB 50/person/year; UEBMI pooling fund surplus transfer RMB 70/person/year; URBMI pooling fund surplus transfer RMB 35/person/year	Personal payment less than or equal to 0.2% of last year's per capita disposable income of permanent residents in the city	Su Fu [2017] No.77	Expansion phase	Suzhou	Medical insurance fund allocation: Employee enrollees: Individual 24 RMB, Employer 84 RMB; Resident enrollees: Individual 24 RMB, Medical insurance fund 30 RMB	Employees: 108 RMB per person per year; Residents: 54 RMB per person per year	Su Fu [2022] No.78
Initial stage	Ningbo	Employer rate 0.2%, active employee rate 0.1%, flexible/unemployed rate 0.3%, retiree rate 0.1%	Not specified in document	Ningbo City Pilot Plan for Long-Term Care Insurance System 2016 (Draft for Public Comment)	Expansion phase	Ningbo	Active employees: Individual 45 RMB, Employer 45 RMB; Retirees: Individual 45 RMB, Medical insurance fund 45 RMB; Urban and rural residents: Individual 30 RMB, Government subsidy 60 RMB	90 RMB per person per year	Yong Zheng Ban Fa [2022] No. 39

Table 13 (continued) The annual funding standards and funding levels of LTCI pilot cities (the first batch)

Pilot phase	Pilot Cities	Annual Funding Standard	Funding Level	Policy Document Number	Pilot phase	Pilot Cities	Annual Funding Standard	Funding Level	Policy Document Number
Initial stage	Anqing	RMB 30/person/year, incl. RMB 20 from medical pooling fund surplus and RMB 10 personal payment	Not specified in document	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Individual: 20 RMB, Government subsidy: 5 RMB, Medical insurance fund: 15 RMB	40 RMB per person per year	Yi Zheng Ban Mi [2020] No.1
Initial stage	Shangrao	Government-funded agencies, restructured/insolvent/difficult enterprises: Finance department transfers RMB 60/person/year (RMB 30 from medical fund, RMB 30 from fiscal subsidy); personal share RMB 40 deducted from personal account or paid in cash if insufficient/no account. Non-government-funded units: Finance department transfers RMB 30/person/year (medical fund); employer share RMB 30/person/year collected by handling agency; personal share RMB 40 deducted from personal account or paid in cash if insufficient/no account. Insured with no employer: pay RMB 70/person/year via personal account or cash if insufficient/no account; RMB 30 (medical fund) transferred by finance department.	RMB 100/person/year	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Individual: 50 RMB, Medical insurance fund: 35 RMB, Employer or Government subsidy: 5 RMB	90 RMB per person per year	Rao Fu Zi [2019] No.33
Initial stage	Qingdao	Employees: From medical pooling fund, transfer twice the amount from 0.2 percentage points of monthly employee medical personal account credit. Residents: Based on last year's per capita disposable income of urban residents, transfer 0.2% from residents' (excluding minors and students) medical pooling fund. Municipal finance transfers RMB 20 million annually from welfare lottery public funds to the urban residents' nursing insurance fund.	Not specified in document	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Employees: Individual 0.2% (allocated from the medical insurance fund), Government subsidy 30 RMB. Residents: Individual contribution of no less than 10 RMB from the medical insurance fund, and no less than 20 RMB from the medical insurance subsidy fund	0.3% of the total medical insurance contribution base	Qing Zheng Fa [2021] No.6
Initial stage	Jingmen	Personal 37.5%, medical fund 25%, fiscal subsidy 37.5%	0.4% of last year's per capita disposable income of city residents	Jingmen City Long-Term Care Insurance Measures (Trial) 2016	Expansion phase	Jingmen	0.4% of last year's per capita disposable income of residents (Individual 37.5%, Medical insurance fund 25%, Government subsidy 37.5%)	0.4% of last year's per capita disposable income of residents	Jingmen City Long-Term Care Insurance Measures (Trial) 2016
Initial stage	Guangzhou	RMB 130/person/year	RMB 130/person/year	Sui Ren She Gui Zi [2017] No.6	Expansion phase	Guangzhou	Employees: Individual under 35 years old: No contribution; 35-45 years old: 0.02%; 45 to retirement age: 0.08%; Retirees: 0.12%; Employer: 0.05%. Residents: Individuals aged 18 and above (students): Individual 0.03%, Government subsidy 0.03%; Other residents aged 18 and above: Individual 0.12%, Government subsidy 0.12%	Employees: 60% of last year's average monthly salary. Residents: 0.06% of the current year's medical insurance contribution base (for students aged 18 and above), 0.24% of the current year's medical insurance contribution base (for other residents aged 18 and above)	Sui Yi Bao Gui Zi [2020] No.10
Initial stage	Chongqing	RMB 90 personal (paid via personal account of basic medical insurance), RMB 60 medical subsidy	RMB 150/person/year	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	Employees: Medical insurance fund allocation (Individual medical insurance contribution base * 0.1% * 12, Employer medical insurance contribution base * 0.1% * 12). Residents and retired employees: Medical insurance fund allocation (Last year's average actual medical insurance contribution base of active employees in the city * 0.2% * 12, equally shared between individual and medical insurance fund)	122 RMB per person per year (2022 standard)	Yu Yi Bao Fa [2021] No.63
Initial stage	Chengdu	Pooling fund of BMI: Based on UEBMI contribution base, transfer 0.2% per person per month from basic medical insurance fund. Personal account of BMI: For non-retired under and equal to 40 years old, transfer 0.1% per person per month from personal account based on UEBMI contribution base; for non-retired aged >40 and retirees still contributing to UEBMI, transfer 0.2%; for retirees, transfer 0.3% based on personal account credit base. Fiscal subsidy: For retirees, based on personal account credit base, subsidise at 0.1% per person per month.	Pooling fund of BMI transfer 0.2%/month, personal account of BMI transfer 0.1-0.3%/month	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Urban employees: Personal contribution: For non-retired individuals under 40, 0.1% of the basic medical insurance base per month; for non-retired individuals over 40, 0.2% per month; for retirees, 0.3% per month. Employers contribution: 0.2% of the base per month from the pooled fund. Fiscal subsidy: Based on retirees' insurance base, 0.01% per month, annual subsidy. Urban and rural residents: Adults pay 25 RMB per year, subsidy 30 RMB; students and children (including university students) pay 10 RMB per year, subsidy 10 RMB.	Employees: 0.31% to 0.51% of the medical insurance base; Residents: 20 to 55 RMB.	Cheng Yi Bao Fa [2022] No.10
Initial stage	Shihezi	Personal: UEBMI RMB 180/person/month (from medical fund); RBMI RMB 24/person/year. Fiscal subsidy: RMB 40/person/year for aged 60+ and severely disabled; RMB 500,000/year from welfare lottery public funds.	1% of local social insurance average contribution base or per capita disposable income of urban and rural residents	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	Employees: 50 RMB (allocated from the medical insurance fund); Residents: 50 RMB	50 RMB per person per year	Shi Shi Ban Gui Fa [2022] No.4

From the information in Table 14, in the expansion stage of the second batch of LTCI pilot cities in China, funding standards and funding levels displayed pronounced diversification and refinement. Overall, the main sources of funding across the cities included employee contributions, employer contributions, transfers from the pooled medical insurance fund, and government fiscal

subsidies. The proportions and amounts set varied substantially between cities, with most demonstrating differentiated treatment for various population groups (including active employees, retirees, flexible workers, and urban/rural residents).

In terms of funding standards, most cities adopted an approach based on the 'medical insurance contribution base' (the wage or income amount used as the basis for paying medical insurance contributions). For example, Shijingshan District in Beijing stipulated that both employees and employers contribute RMB 90 per year (transferred from the medical insurance fund). Tianjin and Jincheng directly required insured persons to contribute between 0.15 per cent and 1.8 per cent of the medical insurance contribution base, salary, or pension, illustrating a coexistence of proportional and fixed-amount methods. In some cities, such as Hohhot and Fuzhou, the employer and employee contribution rates were set at 0.125 per cent or 0.2 per cent respectively, with the medical insurance fund transferring an amount proportional to contributions, highlighting the central role of the medical insurance fund in LTCI financing.

Regarding differentiated contributions across population groups, cities adopted increasingly precise designs. For example, Nanning set different contribution rates for active employees, retirees, and flexible workers, ranging from 0.15 per cent to 0.3 per cent, calculated based on pension income in the case of retirees.

Qianxinan Prefecture and Urumqi have distinguished the annual funding standards for residents and employees. For instance, in Qianxinan Prefecture, the individual contribution is RMB 7 per person. In Urumqi, employees are subject to proportional financing while residents are subject to fixed-amount financing. Notably, some areas provided full or partial payment on behalf of socially disadvantaged groups; for example, Hanzhong paid 50 per cent of contributions for special disadvantaged retired individuals, with the government covering the remainder.

In terms of funding levels, the per capita annual funding amount in most cities ranged between RMB 70 and RMB 240, with significant variation. Northern cities such as Shijingshan District in Beijing, Panjin, and Tianjin tended to have higher funding levels (e.g., Panjin reaching RMB 144 per person per year; Shijingshan RMB 180; and Gannan Tibetan Autonomous Prefecture as high as RMB 240), whereas some central and western regions such as Qianxinan ranged between RMB 35 and RMB 70. The main reasons for these differences lay in local economic development levels, the surplus of the medical insurance fund, and the fiscal capacity of local governments. Cities with higher funding levels often had higher contribution rates and greater fiscal matching, reflecting stronger expectations regarding benefit provision.

Overall, the expansion stage of the second batch of pilot cities displayed three

notable trends in financing arrangements: First, diversified sources. Combining individual and employer contributions, transfers from the medical insurance fund, and fiscal subsidies, with some regions also introducing social donations. Second, differentiated design. Setting distinct contribution standards and subsidy rates for different employment statuses, income levels, and vulnerable groups. Third, rising yet stable standards. Funding levels were generally higher than in the early stage, but remained within the economic capacity of each locality, thereby safeguarding the sustainable operation of the LTCl system. This financing arrangement reflects both locally tailored policy adjustments and a gradual national exploration of a path that balances equity with sustainability in LTCl system development.

Table 14 The annual funding standards and funding levels of LTCI pilot cities (the second batch)

Pilot phrase	Pilot Cities	Annual Funding Standard	Funding Level	Policy Document Number
Expansion phase	Shijingshan district of Beijing	Employees: Individual 90 RMB, Employer 90 RMB (allocated from the medical insurance fund); Flexible employment workers: Individual 90 RMB (self-paid), Employer 90 RMB (allocated from the medical insurance fund); Residents: Individual 90 RMB, Government subsidy 90 RMB	180 RMB per person per year	Jing Shi Yi Bao Fa [2020] No.16
Expansion phase	Tianjin	Employer 120 RMB (allocated from the medical insurance fund), Individual 120 RMB (deducted from the urban employee major medical assistance fee)	Last year's total employee salary * 0.16% + Last year's average employee salary in the city * 0.16%	Jin Zheng Ban Gui [2020] No.24
Expansion phase	Jincheng	Employer: Contribute 1.8% of the medical insurance contribution base. Individual: Active employees contribute 1.8% of the medical insurance contribution base (allocated from the medical insurance fund); Retired individuals contribute 1.8% of their pension (allocated from the medical insurance fund); Flexible employment workers contribute 0.3% of the minimum medical insurance contribution base for employees in the city (allocated from the medical insurance fund); Flexible employment retirees contribute 0.15% of their pension (allocated from the medical insurance fund). Government subsidy: 0.15% of the pension for retired individuals (including flexible employment retirees)	Medical insurance contribution base * (0.15% ~ 1.8%), or pension retirement salary * (0.15% ~ 1.8%)	Jin Shi Yi Bao Fa [2021] No.5
Expansion phase	Hohhot	Employees: Employer contributes 0.2% of the medical insurance contribution base (allocated from the medical insurance fund), Active employees contribute 0.2% of the medical insurance contribution base (allocated from the medical insurance fund), Retired individuals contribute 0.2% of their pension (allocated from the medical insurance fund or self-paid), Government subsidises all enrollees of UEBMI 10 RMB/person/year. Residents: Individual 10 RMB, Medical insurance fund allocation 50 RMB, Government subsidy 10 RMB	Employee medical insurance contribution base * 0.4%, Residents 70 RMB per person per year	Hu Zheng Ban Fa [2020] No.31
Expansion phase	Panjin	Employees 144 RMB (Employer 72 RMB, Individual 72 RMB), Flexible employment workers 144 RMB (Medical insurance 72 RMB, Individual 72 RMB), Retired individuals 144 RMB (Medical insurance 72 RMB, Individual 72 RMB)	144 RMB per person per year	Pan Yi Bao Fa [2022] No.15
Expansion phase	Fuzhou	Employer: 0.125% of the medical insurance contribution base, allocated from the medical insurance fund for 2021-2022. Individual: Active employees contribute 0.125% of the medical insurance contribution base (allocated from the medical insurance fund), Retired individuals: 0.125% of the medical insurance contribution base allocated to their personal account (allocated from the medical insurance fund)	Medical insurance contribution base * 0.25%, or medical insurance contribution base * 0.125% + medical insurance allocated to the personal account base * 0.125%	Rong Yi Bao Wen [2021] No.5
Expansion phase	Kaifeng	Medical insurance enrollees: Employer 60 RMB, Individual 60 RMB (both allocated from the medical insurance fund); Individuals without a personal medical insurance account: Medical insurance 60 RMB, Individual 60 RMB. Specially recognized disadvantaged retired employees: Government subsidy 60 RMB	120 RMB per person per year	Bian Zheng [2020] No.36

Table 14 (continued) The annual funding standards and funding levels of LTCI pilot cities (the second batch)

Pilot phrase	Pilot Cities	Annual Funding Standard	Funding Level	Policy Document Number
Expansion phase	Xiangtan	Employer: 0.12% of the medical insurance contribution base (allocated from the medical insurance fund), Individual: Active employees contribute 0.12% of the medical insurance contribution base (allocated from the medical insurance fund, employees without a personal medical insurance account are paid by the employer), Retired individuals contribute 0.24% of last year's pension income (allocated from the medical insurance fund, employees without a personal medical insurance account contribute 0.24% of last year's average pension income self-paid), Flexible employment workers contribute 0.24% of last year's average wage of employed individuals self-paid.	Medical insurance contribution base * 0.24% or average wage of employed individuals * 0.24%	Tan Yi Bao Fa [2021] No.1
Expansion phase	Nanning	Active employees: Individual: 0.15% of the medical insurance contribution base (paid by the medical insurance fund), Employer: 0.15% of the medical insurance contribution base; Retired individuals: 0.15% of last year's personal pension (deducted from the personal medical insurance account); Flexible employment or unemployed individuals: 0.3% of the medical insurance contribution base (deducted from the personal medical insurance account)	Medical insurance contribution base * 0.3% or last year's personal pension * 0.15%	Nan Fu Gui [2021] No.3, Implementation Opinions on Deepening the Pilot of the Long-Term Care Insurance System in Nanning City (2023)
Expansion phase	Qianxinan Buyei and Miao Autonomous Prefecture	Active employees: Employer 35 RMB, Individual 35 RMB (allocated from the medical insurance fund); Retired individuals: 35 RMB (allocated from the medical insurance fund); Residents: 10 million RMB from the urban and rural resident basic medical insurance fund is transferred as the start-up fund, 7 RMB per person per year (paid from the start-up fund), Government subsidy 20% of the total resident Long-Term Care insurance funding standard	Active employees: 70 RMB per person per year, Retired individuals: 35 RMB per person per year, Residents: 7 RMB per person per year	Qian Xi Nan Fu Ban Fa [2022] No.23
Expansion phase	Kunming	Active employees: Medical insurance contribution base * 0.4% (Employer 0.2%, Individual 0.2%, both transferred from the medical insurance fund); Flexible employment workers: Medical insurance contribution base * 0.4%, paid by the individual; Retired individuals: 0.4% of the medical insurance personal account contribution base (0.2% transferred from the medical insurance fund, 0.2% government subsidy)	Medical insurance contribution base * 0.4%	Kun Zheng Fa [2023] No.5
Expansion phase	Hanzhong	Employer 30 RMB, Individual 50 RMB (both allocated from the medical insurance fund), Government subsidy 20 RMB. Specially disadvantaged retired individuals: 50% paid by the individual and 50% by the government subsidy	100 RMB per person per year	Hanzhong City Long-Term Care Insurance Implementation Rules (Trial)
Expansion phase	Urumqi	Employees (paid by the medical insurance fund): Employer contributes 0.1% of the employee's total salary, Individual contributes 0.1% of their own salary income; Flexible employment workers: 0.1% of last year's average social wage in the city; Residents: Individual 40 RMB, Government subsidy not exceeding 20 RMB	Employees: Total salary * 0.2% or last year's average social wage in the city * 0.1%; Residents: No more than 60 RMB per person per year	Wu Zheng Ban Gui [2021] No.1
Expansion phase	Gannan Tibetan Autonomous Prefecture	Active employees: Individual 120 RMB, Employer 120 RMB; Retired individuals: 240 RMB allocated from the medical insurance fund	240 RMB per person per year	Zhou Yi Bao Zi [2021] No.143

6.3 Benefit Design

This section discusses the benefit policy of LTCI pilot system from the following four aspects: the insured population, beneficiaries, benefit limits, and benefit levels.

6.3.1 Insured Population and Beneficiaries

Currently, China has established a relatively comprehensive welfare system for older people and for disabled people. For older people, this includes subsidies for advanced age, subsidies for elderly care services, and nursing care subsidies. The term ‘elderly care services’ is a literal translation from the Chinese expression ‘养老服务’, which, in Chinese policy documents, refers broadly to a range of services for older people, including home-based care, community care, and residential care. In this thesis, the term will be used in this policy-specific sense. For disabled people, it includes living allowances for those in financial difficulty and nursing care subsidies for those with severe disabilities (Dai, 2024).

According to the 2023 *National Basic Elderly Care Service List*, the scope of nursing subsidies for severely disabled individuals includes both older and non-older individuals with disabilities (Dai, 2024). Statistics from the Ministry of Civil Affairs and the National Office on Ageing reveal that by the end of 2022, 944,000 older individuals in China received elderly nursing subsidies (The term ‘elderly nursing subsidies’ is a literal translation from the Chinese term ‘老年护理补贴’, referring to government-provided financial assistance to older people who require nursing care), while as of the first quarter of 2024, 15.927 million individuals were receiving nursing subsidies for severe disabilities (Dai, 2024).

From the perspective of LTCI enrolment, it is widely accepted that including disabled people as eligible participants is reasonable in the Chinese policy context. However, whether they should also be entitled to LTCI benefits remains a critical and contested policy issue (Dai, 2024). According to Dai (2024), if disabled people are included as benefit recipients, this could create situations where an individual qualifies for both LTCI funding or services and, at the same time, can claim whichever is the higher-value subsidy between elderly nursing subsidies and severe disability nursing subsidies. Such overlap may increase the risk of misallocation or misuse of public resources. On the other hand, if disabled people are excluded from LTCI benefits but are still required to contribute to the scheme, this would conflict with the social insurance principle that contributions should correspond to entitlements.

Currently, China's LTCI pilot system is linked to the basic medical insurance system. The pilot phase initially targeted workers enrolled in basic medical insurance (UEBMI), focusing on addressing the basic care needs of individuals with severe disabilities. The priority was to provide coverage for eligible older individuals with disabilities and those with severe disabilities.

From Table 15, in the first batch of LTCI pilot cities in China, both the scope of the insured population and the eligibility criteria for benefit recipients underwent significant changes between the initial stage in 2016 and the expansion stage

in 2020. Overall, the trend was towards broader coverage and progressively more detailed beneficiary standards.

In terms of the insured population, during the initial stage most cities primarily covered enrolees of the UEBMI, with some regions also including enrolees of the RBMI. For example, in 2016, Changchun, Nantong, and Ningbo explicitly covered both UEBMI and RBMI enrolees, whereas cities such as Anqing, Shangrao, and Qiqihar restricted coverage to UEBMI enrolees only, making the overall institutional coverage relatively limited at the outset. By the expansion stage, although most pilot cities continued to base coverage on medical insurance enrolees, the definition of eligible participants became more stable, and in some cases broader, for example, specifying 'all enrolees' (of both UEBMI and RBMI) without strict distinctions between employees and residents, thus laying the foundation for future universal coverage.

Regarding benefit recipients, the common approach in the initial stage was to target severely disabled individuals as the core protection group. Severe disability generally refers to people who, in an assessment of self-care ability, have lost most or all capacity to perform activities of daily living, such as those requiring round-the-clock care and unable to independently complete basic activities like eating, dressing, and washing. Some cities added extra conditions: for instance, Shanghai required older persons aged 60 or above with disability

assessment levels 2–6; Jingmen included those bedridden for more than six months and unable to manage basic daily life; Guangzhou adopted the Barthel Index ≤ 40 , an internationally recognised tool for assessing activities of daily living, to define disability level. The concepts of disability levels mentioned in this section, as well as ‘moderate’ and ‘severe’ disabilities, will be elaborated upon in Section 6.4 Disability Assessment.

By the expansion stage, definitions of benefit recipients became more diversified and refined. On the one hand, some cities added moderately disabled persons or specific disease groups to the eligibility scope. For example, Changchun, Nantong, and Chengdu explicitly included moderately disabled groups, while Qingdao and Shangrao listed ‘patients with severe dementia’ as a separate protection category. On the other hand, restrictions for older groups became more explicit, for example, in the expansion stage Changchun included persons aged 85 or above who were not fully disabled.

Overall, between 2016 and 2020, the insured population coverage in the first batch of pilot cities remained broadly stable, but with some relaxation in certain areas, while the scope of benefit recipients expanded from solely severely disabled individuals to include multiple disability levels, specific high-age groups, and special disease categories. This evolution reflects the transition of the policy from the exploratory to the mature stage, as well as the growing

standardisation in the application of assessment systems such as disability grading and the Barthel Index.

Table 15 The insured population and beneficiaries of LTCI pilot cities (the first batch)

Pilot phrase	Pilot Cities	Insured Population	Beneficiaries	Policy Document Number	Pilot phrase	Pilot Cities	Insured Population	Beneficiaries	Policy Document Number
Initial stage	Chengde	Enrolees of UEBMI	Severely disabled people	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	Enrolees of UEBMI	Severely disabled people	Cheng Yi Bao Zi [2021] No.50
Initial stage	Changchun	Enrolees of UEBMI and RBMI	Severely disabled people	Chang Fu Ban Fa [2015] No.3, Chang Ren She [2015] No.21	Expansion phase	Changchun	Enrolees of UEBMI and RBMI	Moderately and severely disabled people, or older people (85-90 years old without complete disability and older people 90+)	Chang Yi Bao Fa [2021] No.45
Initial stage	Qiqihar	Enrolees of UEBMI	Severely disabled people	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	Enrolees of UEBMI	Severely disabled people	Qi Zheng Ban Gui [2021] No.1
Initial stage	Shanghai	Enrolees of UEBMI (aged 60+) and enrolees of RBMI (aged 60+)	Aged 60+ with disability assessment level 2-6	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	Enrolees of UEBMI (aged 60+) and enrolees of RBMI (aged 60+)	People aged 60 and above with a disability assessment level of 2 to 6	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	Enrolees of UEBMI and RBMI	Severely disabled people	Opinions on Establishing the Basic Care Insurance System (Trial) 2015	Expansion phase	Nantong	Enrolees of UEBMI and RBMI	Moderately and severely disabled people. Moderately dementia patients	Tong Zheng Fa [2015] No.73, Tong Yi Bao Fa [2022] No.42
Initial stage	Suzhou	Enrolees of UEBMI and RBMI	Moderately and Severely disabled people	Su Fu [2017] No.77	Expansion phase	Suzhou	Enrolees of UEBMI and RBMI	Moderately and severely disabled people	Su Fu [2022] No.78
Initial stage	Ningbo	Enrolees of UEBMI and RBMI	Severely disabled people	Ningbo City Pilot Plan for Long-Term Care Insurance System 2016 (Draft for Public Comment)	Expansion phase	Ningbo	Enrolees of UEBMI and RBMI	Severely disabled people	Yong Zheng Ban Fa [2022] No. 39
Initial stage	Anqing	Enrolees of UEBMI	Severely disabled people	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Enrolees of UEBMI	Severely disabled people	Yi Zheng Ban Mi [2017] No.5, Yi Zheng Ban Mi [2020] No.1
Initial stage	Shangrao	Enrolees of UEBMI	Severely disabled people and severe dementia	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Enrolees of UEBMI and RBMI	People with severe disability or severe dementia	Rao Fu Zi [2019] No.33, Rao Ren She Zi [2019] No.41
Initial stage	Qingdao	Enrolees of UEBMI and RBMI	Insured persons who, due to old age, illness, or disability, have wholly or partially lost certain bodily functions, are bedridden long-term, unable to live independently, and require clinical medical care; or whose condition changes and require medical care services delivered at home by healthcare staff	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Enrolees of UEBMI and RBMI	People with disability level 3-5 or severe dementia	Qing Yi Bao Fa [2021] No.12
Initial stage	Jingmen	Enrolees of UEBMI (from 2016) , enrolees of RBMI (from 2017)	Bedridden long-term due to old age, illness, or disability, or after at least 6 months of treatment with a basically stable condition but unable to live independently.	Jingmen City Long-Term Care Insurance Measures (Trial) 2016	Expansion phase	Jingmen	Enrolees of UEBMI and RBMI	Disabled people	Jingmen City Long-Term Care Insurance Measures (Trial) 2016
Initial stage	Guangzhou	Enrolees of UEBMI	Barthel Index score less and equal to 40	Sui Ren She Zi [2017] No.6	Expansion phase	Guangzhou	Enrolees of UEBMI and RBMI	Disabled people	Sui Yi Bao Gui Zi [2020] No.10
Initial stage	Chongqing	Enrolees of UEBMI	Severely disabled people	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	Enrolees of UEBMI	Severely disabled people	Yu Yi Bao Fa [2021] No.63
Initial stage	Chengdu	Enrolees of UEBMI	Severely disabled people	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Enrolees of UEBMI and RBMI	Moderately and severely disabled people	Cheng Yi Bao Fa [2022] No.16 and No.17, Notice on Including All Moderately Disabled Individuals in the Long-Term Care Insurance System and Related Matters (2023)
Initial stage	Shihezi	Enrolees of UEBMI and RBMI	Bedridden long-term due to loss of bodily functions, unable to live independently.	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	Enrolees of UEBMI and RBMI	Severely disabled people	Shi Shi Fa [2017] No.16

From Table 16, in the expansion stage, newly added cities in the second batch exhibited an overall trend towards relative uniformity and simplification in defining the insured population and benefit recipients. In most cities, the insured population consisted of enrollees of UEBMI. However, when considering the first and second waves of pilots together, a total of fifteen pilot cities have extended LTCI coverage to include both employees enrolled in the UEBMI and individuals covered by the RBMI, this ‘dual-track coverage’ model indicates a policy design aimed at achieving universal coverage for both employee and resident groups.

However, in defining benefit recipients, the second-batch cities generally concentrated their criteria on severely disabled people—those who, in an assessment of self-care ability, had lost most or all capacity to perform activities of daily living. Only a few cities provided further refinement. For instance, Hohhot included both moderately and severely disabled individuals; Fuzhou specifically identified severely disabled older persons, combining age and disability status in its eligibility definition; and Hanzhong adopted a broader criterion, defining beneficiaries as persons with disabilities.

Table 16 The insured population and beneficiaries of LTCI pilot cities (the second batch)

Pilot phase	Pilot Cities	Insured Population	Beneficiaries	Policy Document Number
Expansion phase	Shijingshan district of Beijing	Enrolees of UEBMI and RBMI	Severely disabled people	Jing Shi Yi Bao Fa [2020] No.16
Expansion phase	Tianjin	Enrolees of UEBMI	Severely disabled people	Jin Zheng Ban Gui [2020] No.24
Expansion phase	Jincheng	Enrolees of UEBMI	Severely disabled people	Jin Shi Yi Bao Fa [2021] No.26
Expansion phase	Hohhot	Enrolees of UEBMI and RBMI	Moderately and severely disabled people	Hu Zheng Ban Fa [2020] No.31
Expansion phase	Panjin	Enrolees of UEBMI	Severely disabled people	Pan Zheng Ban Fa [2020] No.25, Pan Yi Bao [2022] No.79
Expansion phase	Fuzhou	Enrolees of UEBMI	Severely disabled older people	Rong Yi Bao Wen [2021] No.5, Rong Min [2021] No.271
Expansion phase	Kaifeng	Enrolees of UEBMI	Severely disabled people	Bian Zheng [2020] No.36
Expansion phase	Xiangtan	Enrolees of UEBMI	Severely disabled people	Tan Yi Bao Fa [2021] No.1
Expansion phase	Nanning	Enrolees of UEBMI	Severely disabled people	Implementation Opinions on Deepening the Pilot of the Long-Term Care Insurance System in Nanning City (2023)
Expansion phase	Qianxinan Buyei and Miao Autonomous Prefecture	Enrolees of UEBMI and RBMI	Severely disabled people	Qian Xi Nan Yi Bao Tong [2021] No.10
Expansion phase	Kunming	Enrolees of UEBMI	Severely disabled people	Kun Zheng Fa [2023] No.5
Expansion phase	Hanzhong	Enrolees of UEBMI	Disabled people	Hanzhong City Long-term Care Insurance Implementation Rules (Trial)
Expansion phase	Urumqi	Enrolees of UEBMI and RBMI	Severely disabled people	Wu Zheng Ban Gui [2021] No.1
Expansion phase	Gannan Tibetan Autonomous Prefecture	Enrolees of UEBMI	Severely disabled people	Zhou Yi Bao Zi [2021] No.143

A comparison between the first-batch pilot cities (following the release of their expansion policies) and the newly added cities in the second batch during the expansion stage reveals that the main differences lie in the breadth of coverage and the level of refinement in benefit criteria. While first-batch expansion-stage cities also primarily covered UEBMI and RBMI enrolees, their classification of benefit recipients was noticeably more diverse. In contrast, the new cities in the second batch tended to rely on the core concept of severe disability for defining beneficiaries, lacking the more complex multi-level grading systems or separate categories for specific diseases. This approach reflects a focus on operational feasibility and simplicity during the initial phase of system implementation.

Overall, from the first batch to the second batch, the coverage model for insured populations has become increasingly standardised, whereas the definition of benefit recipients has shifted from the multi-tiered, multi-dimensional refined standards of the first batch's mature stage back towards a concentrated focus on severely disabled individuals. This not only reflects the cautious strategies adopted by newly participating cities at the outset of system building but also suggests that the more diversified designs of the first batch largely emerged during the pilot's maturity phase.

6.3.2 Benefit Limit and Benefit Level

From the perspective of benefit standards in China's LTCI system, the two national pilot policy documents (Ministry of Human Resources and Social Security of the People's Republic of China, 2016; National Healthcare Security Administration of China and Ministry of Finance, 2020) outline three fundamental guidelines: (1) overall expenditure control + categorised guidance; (2) moderate coverage, and (3) support for the disadvantaged.

The guideline of overall expenditure control is reflected in *Document No.80*, which stipulates that "fund coverage for eligible LTC expenses should generally be controlled at around 70 per cent" (Ministry of Human Resources and Social Security of the People's Republic of China, 2016, p.1). Categorised guidance

is demonstrated through benefit payment ratios designed to steer care preferences (Ministry of Human Resources and Social Security of the People's Republic of China, 2016). LTCI services fall into three main categories: First, community- and home-based services, serving as the foundation, focus on providing daily care for mildly disabled older individuals, transitional care for patients recently discharged from hospitals, and 'home hospital' services for moderately and severely disabled seniors living at home (Ministry of Human Resources and Social Security of the People's Republic of China, 2016; National Healthcare Security Administration of China and Ministry of Finance, 2020). Second, elderly care institutions primarily offer care and hygiene assistance for severely disabled older individuals (Ministry of Human Resources and Social Security of the People's Republic of China, 2016; National Healthcare Security Administration of China and Ministry of Finance, 2020). Third, medical institutions, at the top of the LTCI service hierarchy, focus on rehabilitation for disabled individuals with chronic diseases and palliative care for terminal patients (Ministry of Human Resources and Social Security of the People's Republic of China, 2016; National Healthcare Security Administration of China and Ministry of Finance, 2020).

The second principle, moderate coverage, pertains to the scope of fund payments. While ensuring coverage for expenses directly related to care services (such as medications and treatment costs) indirect costs like bed fees

and reassessment fees for disability are only partially or minimally covered (Dai, 2024). The third principle, support for the disadvantaged, emphasises a benefit structure that prioritises impoverished disabled seniors. Examples include government subsidies, free participation in LTCI programs, or care services provided by charitable organisations (Dai, 2024).

Table 17 presents the benefit limits (i.e., the maximum service provision amount) and benefit levels (i.e., the maximum LTCI reimbursement rate) for the first batch of LTCI pilot cities in China during the initial stage in 2016 and the expansion stage in 2020.

From the perspective of expanded coverage and service types, at the start of the pilots in 2016, most LTCI policies in the first-batch cities focused on two service categories: institutional care and home care. Benefit limits were usually set on a per-day basis, with relatively narrow coverage and limited items of service. For example, Chengde set daily fixed amounts of RMB 60 for hospitals, RMB 50 for eldercare institutions, and RMB 40 for home care; Qingdao established daily limits only for institutional care and hospital-based specialised nursing. By the 2020 expansion stage, coverage had expanded significantly. Not only adding community day care (e.g., Shanghai) and assistive device subsidies (e.g., Nantong, Shangrao, Chengdu) but also introducing more detailed classifications such as secondary hospital care (e.g., Chengde). Home

care, previously a single daily fixed rate, was expanded to include monthly limits or hourly pricing (e.g., Ningbo, Suzhou), forming a diversified ‘institution-home-community-hospital’ service system.

From the perspective of raising benefit limits and diversifying pricing methods, most cities increased payment standards for institutional and home care in the expansion stage. For example, in Qiqihar, the institutional care rate increased from a 60 per cent reimbursement with a fixed amount of RMB 30/day to a 75 per cent reimbursement; in Chengde, institutional care rose from RMB 60 per bed/day to RMB 70–80 per bed/day, with the addition of a monthly limit of RMB 1,200 for home care and supplementary care subsidies; in Chengdu, monthly fixed amounts for institutional and home care at all severe-disability levels rose significantly, with the highest reaching RMB 3,196 per person/month. Meanwhile, some cities shifted away from the single daily fixed-rate model to charging per service or per hour (e.g., Suzhou’s home care at RMB 40/hour, Ningbo’s at RMB 65/hour), better aligning with the flexible needs of home-based care.

From the perspective of adjusting benefit levels and introducing differentiated targeting, the expansion stage saw an overall trend towards more refined and tiered reimbursement rates. Some cities maintained stable rates (e.g., Chengde at 70 per cent), but most introduced differentiated rates by service type,

disability level, and beneficiary group. For example, Qiqihar increased the home care rate from 50 per cent to 70 per cent; Ningbo, in the expansion stage, set institutional care at 70 per cent and home care at 80 per cent; Guangzhou differentiated by employee/resident status, disability level, and cost category (daily living care, medical care, equipment and consumables), with rates for employees at 75 per cent for institutional care and 90 per cent for home care, and for residents at 70 per cent and 85 per cent, respectively; Changchun reduced rates, lowering employees from 90 per cent to 70 per cent and residents from 80 per cent to 60 per cent. Overall, employee groups and those with severe disabilities generally enjoyed higher reimbursement rates, reflecting policy preference towards economically contributing groups and high-need populations.

From the perspective of linking disability grading assessments with payment standards, by 2020 this practice had become common across most pilot cities. Shanghai, Nantong, Chengdu, Ningbo, and others explicitly aligned service frequency, duration, and limits with disability assessment levels, with higher levels of disability entitling enrolees to greater service frequency, longer duration, and higher subsidies. For example, Shanghai provided 3-7 home visits per week for individuals at disability levels 2-6 and offered additional hourly services or cash subsidies for those at levels 5–6 receiving continuous home care. Ningbo and Nantong refined institutional and home care limits by

disability level, granting higher time allocations or amounts to those with higher disability levels. The specific criteria for disability assessment are discussed in detail in Section 6.5.

Table 17 The benefit limits and benefit levels of LTCI pilot cities (the first batch)

Pilot phase	Pilot Cities	Benefit Limit	Benefit Level	Policy Document Number	Pilot phase	Pilot Cities	Benefit Limit	Benefit Level	Policy Document Number
Initial stage	Chengde	Daily quota: Hospitals RMB 60/bed; nursing/elderly care RMB 50/bed; home care RMB 40/day. Excess costs paid by individual or family	70%	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	Institutional care: Primary medical institutions 70 RMB/bed/day, secondary and above institutions 80 RMB/bed/day, nursing homes 60 RMB/bed/day. Home care 1200 RMB/person/month, daily 40 RMB for partial months. Home supplementary care 300 RMB/person/month.	70%	Cheng Yi Bao Zi [2021] No.50
Initial stage	Changchun	Set by city social medical insurance agency per citywide sample average price or govt procurement price	Employees 80%, residents 80%	Chang Fu Ban Fa [2015] No.3, Chang Ren She [2015] No.21	Expansion phase	Changchun	The maximum payment limit can be dynamically adjusted based on the fund's operational status.	Urban employees 70%, rural and urban residents 60%	Ji Yi Bao Lian [2021] No.7
Initial stage	Qiqihar	Medical-care RMB 30/person/day; elderly-care RMB 25/person/day; home medical/elderly care RMB 20/person/day.	Medical-care institutions 60%, elderly-care institutions 55%, home care 50%	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	Medical institution care 30 RMB/person/day, nursing institution care 25 RMB/person/day, home care 20 RMB/person/day.	Medical institution care 75%, nursing home care 70%, home care 70%	Qi Zheng Ban Gui [2021] No.1
Initial stage	Shanghai	Insured persons at assessment levels 2-6 may receive community home care, elderly care institution care, or inpatient medical nursing. For home care: L2-3 receive 3 visits/week; L4 receive 5 visits/week; L5-6 receive 7 visits/week; each visit lasts 1 hour. L5-6 receiving home care for over 1 month up to 6 months may choose either 1 extra hour/week or RMB 40/month; over 6 months may choose either 2 extra hours/week or RMB 80/month.	Home care 90%, elderly care institutions 85%, medical institutions to be determined	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	Home care: Weekly supply of 3 times for levels 2-3, 5 times for level 4, and 7 times for levels 5-6, each for 1 hour; for levels 5-6 receiving continuous home care for 1-6 months, an additional 1 hour per month or 40 RMB cash subsidy is provided based on the 7 hours of weekly service; for levels 5-6 receiving continuous home care for more than 6 months, an additional 2 hours per month or 80 RMB cash subsidy is provided based on the 7 hours of weekly service. Community day care: 3 days per week for levels 2-3, 5 days per week for level 4. Institutional care: Levels 2-6 are eligible for institutional care. The Municipal Medical Insurance Center and designated care service institutions agree on the long-term care insurance payment standards for nursing services at elderly care institutions through service agreements.	Home care 90%, community care 85%, institutional care 85%	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	Daily limit RMB 70/bed	Medical nursing institutions 60%, elderly care institutions 50%, home visit care monthly limit RMB 1,200	Opinions on Establishing the Basic Care Insurance System (Trial) 2015	Expansion phase	Nantong	Medical institution care: Disability levels 5, 4, 3, 2 -- 70 RMB, 50 RMB, 40 RMB per person per day. Nursing home care: Disability levels 5, 4, 3, 2 -- 50 RMB, 40 RMB, 30 RMB per person per day. Home care: Disability levels 5, 4, 3, 2 -- 15 RMB, 11 RMB, 8 RMB per person per day. Assistive devices: 8000 RMB per year for disability levels 3, 4, 5, 6000 RMB for disability level 2.	Medical institution care 60%, nursing home care 50%	Tong Zheng Fa [2015] No.73, Tong Yi Bao Fa [2022] No.42
Initial stage	Suzhou	Institutional care: severe disability RMB 26/day, moderate RMB 20/day; home care: severe RMB 30/day, moderate RMB 25/day	Not specified in the document	Su Fu [2017] No.77	Expansion phase	Suzhou	Institutional care: Severe disability 30 RMB/person/day, moderate disability 23 RMB/person/day. Home care: Severe disability 18 services per month, moderate disability 13 services per month, 2 hours per service. General home care 40 RMB/person/hour, home medical care 50 RMB/person/hour.	General home care 37.5 RMB/person/hour, home medical care 47.5 RMB/person/hour.	Su Fu [2022] No.78
Initial stage	Ningbo	Daily quota per bed: professional care RMB 70, elderly care RMB 60, home care RMB 50	Not specified in the document	Ningbo City Pilot Plan for Long-term Care Insurance System 2016 (Draft for Public Comment)	Expansion phase	Ningbo	Institutional care: Severe disability Level I 40 RMB/bed/day, Severe disability Level II 50 RMB/bed/day, Severe disability Level III 60 RMB/bed/day. Home care: Severe disability Level I up to 20 hours/month, Severe disability Level II up to 25 hours/month, Severe disability Level III up to 30 hours/month, 65 RMB/hour.	Institutional care 70%, home care 80%.	Yong Zheng Ban Fa [2022] No. 39
Initial stage	Anqing	Medical care in institutions RMB 50/day, elderly care RMB 40/day, home visits RMB 750/month	Medical institution care 60%, elderly care institution care 50%, home visits RMB 750	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Medical institution care 60 RMB/bed/day, nursing home care 50 RMB/bed/day, home care 15 RMB/day.	Medical institution care 60%, nursing home care 50%.	Yi Zheng Ban Mi [2020] No.1
Initial stage	Shangrao	Not specified in the document	Not specified in the document	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Self-care 450 RMB/person/month, home care 900 RMB/person/month, home assistive devices 300 RMB/person/month, institutional care 1200 RMB/person/month, family caregiver 900 RMB/person/month.	No clear regulations	Rao Fu Zi [2019] No.33, Rao Ren She Zi [2019] No.41
Initial stage	Qingdao	Daily quota per bed: RMB 60 for medical nursing in care institutions or at home; RMB 170 for special medical care in secondary hospitals; RMB 200 in tertiary hospitals.	Medical nursing in care institutions or at home 96%, hospital special medical care 90%	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Home care: UEBMI disability levels 3, 4, and 5 provide 3, 5, and 7 hours per week, respectively. RBMI disability levels 3, 4, and 5 provide 2, 3, and 5 hours per week, respectively (caregiver/social worker 50 RMB/hour, nurse 60 RMB/hour, rehabilitation therapist 70 RMB/hour). Institutional care: UEBMI disability levels 3, 4, and 5 provide 22 RMB, 35 RMB, and 50 RMB per day, respectively; RBMI disability levels 3, 4, and 5 provide 15 RMB, 22 RMB, and 35 RMB per day, respectively. UEBMI dementia 50 RMB/day, RBMI dementia 35 RMB/day. Daycare: UEBMI 50 RMB/day, RBMI 35 RMB/day. (Maximum payment limits: UEBMI disability level 3 660 RMB/month, level 4 1050 RMB/month, level 5 1500 RMB/month; RBMI disability level 3 450 RMB/month, level 4 660 RMB/month, level 5 1050 RMB/month.)	Employees 90%, residents 75-80%.	Qing Yi Bao Fa [2021] No.12
Initial stage	Jingmen	Full-day home care: RMB 100/person/day; part-day home care: RMB 40/person/day; elderly care institutions: RMB 100/person/bed/day; hospital care: RMB 150/person/bed/day	Full-day home care 80%, part-day home care 100%, elderly care institutions 75%, hospital care 70%	Jingmen City Long-term Care Insurance Measures (Trial) 2016	Expansion phase	Jingmen	Full-day home care 100 RMB/person/day, partial-day home care 40 RMB/person/day, nursing home care 100 RMB/person/day, hospital care 150 RMB/person/day.	Full-day home care 80%, partial-day home care 100%, nursing home care 75%, hospital care 70%.	Jingmen City Long-term Care Insurance Measures (Trial) 2016
Initial stage	Guangzhou	Basic medical care: institutional care not more than RMB 120 per person per day; home visit care not more than RMB 115 per person per day. Medical nursing: not more than RMB 1,000 per person per month.	Institutional care 75%, home care 90%	Sui Ren She Zi [2017] No.6	Expansion phase	Guangzhou	Level 3 disability: Living care: Institutional care: Employee 120 RMB/day (bed < 35 RMB), Resident 60 RMB/day; Home care: Employee 105 RMB/day, Resident 50 RMB/day. Medical care: Employee 1000 RMB/month, Resident 500 RMB/month; Supplies: Employee 300 RMB/month, Resident 200 RMB/month. Equipment: Employee 300 RMB/month, Resident 200 RMB/month. Level 2 disability: Living care: Institutional care: Employee 30 RMB/day, Resident 15 RMB/day; Home care: Employee 900 RMB/month, Resident 450 RMB/month. Medical care: Employee 500 RMB/month, Resident 250 RMB/month; Supplies: Employee 200 RMB/month, Resident 100 RMB/month. Equipment: Employee 200 RMB/month, Resident 150 RMB/month. Level 1 disability: Living care: Institutional care: Employee 300 RMB/month, Resident 200 RMB/month; Home care: Employee 300 RMB/month, Resident 200 RMB/month; Equipment: 100 RMB/month. Home personal care 40 RMB/person/day, institutional centralized care and home visit care 50 RMB/person/day.	Living care & medical care fees: Employee institutional care 75%, home care 90%; Resident institutional care 70%, home care 85%. Equipment usage fees: Level 3 disability 90%, Level 2 disability 85%, Level 1 disability 80%.	Sui Yi Bao Gui Zi [2020] No.10
Initial stage	Chongqing	RMB 50 per person per day	Not specified in the document	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	Home personal care 40 RMB/person/day, institutional centralized care and home visit care 50 RMB/person/day.	No clear regulations	Yu Yi Bao Fa [2021] No.63
Initial stage	Chengdu	Severe disability Level 1: monthly quota is 50% of Chengdu's 2015 average wage of all urban employees; Level 2: 40%; Level 3: 30%	Institutional care 70%, home care 75%	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Employees: Moderate disability levels 1-2: Institutional care 1060 RMB/person/month; home care 400 RMB/person/month; assistive devices service 3600 RMB/person/year. Moderate disability level 3: Institutional care 1418 RMB/person/month; home care 400 RMB/person/month; assistive devices service 3600 RMB/person/year. Severe disability level 1: Institutional care 1977 RMB/person/month; home care 500 RMB/person/month; assistive devices service 4800 RMB/person/year. Severe disability level 2: Institutional care 2637 RMB/person/month; home care 800 RMB/person/month; assistive devices service 4800 RMB/person/year. Severe disability level 3: Institutional care 3196 RMB/person/month; home care 1000 RMB/person/month; assistive devices service 4800 RMB/person/year. Residents: Moderate disability levels 1-2: Institutional care 531 RMB/person/month; home care 200-240 RMB/person/month; assistive devices service 1800 RMB/person/year. Moderate disability level 3: Institutional care 711 RMB/person/month; home care 200-240 RMB/person/month; assistive devices service 1800 RMB/person/year. Severe disability level 1: Institutional care 942 RMB/person/month; home care 200-240 RMB/person/month; assistive devices service 2400 RMB/person/year. Severe disability level 2: Institutional care 1122 RMB/person/month; home care 200-240 RMB/person/month; assistive devices service 2400 RMB/person/year. Severe disability level 3: Institutional care 1303 RMB/person/month; home care 200-240 RMB/person/month; assistive devices service 2400 RMB/person/year.	Employees 75%, residents 60%.	Cheng Yi Bao Fa [2022] No.16 and No.17, Notice on Including All Moderately Disabled Individuals in the Long-Term Care Insurance System and Related Matters (2023)
Initial stage	Shihezi	Contracted institution care RMB 750/month; home care or non-contracted institution care RMB 25/day	70%	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	Institutional care 750 RMB/person/month, home care 25 RMB/person/day.	Institutional care 70%, home care 75%.	Shi Shi Fa [2017] No.16

Table 18 presents the benefit limits and benefit levels for the second batch of LTCI pilot cities added under *No.37 document* in 2020. First, coverage scope and service types. The second-batch cities generally emphasised diverse service types and contextual differentiation in system design. Most included institutional and home care, with further subdivisions such as professional home care, family-based home care, institutional outreach, and self-care support. For example, Shijingshan District (Beijing) distinguished between professional and family home care, setting hourly prices and monthly time caps; Qianxinan Prefecture set fixed amounts for institutional care, institutional outreach, self-care support, and combined care, and added subsidies for assistive device rental. Some areas (e.g., Jincheng, Nanning) incorporated ‘pure home care’, ‘institutional outreach’, and ‘combined’ models within the same policy, reflecting adaptability to different care needs.

Second, benefit limits and pricing methods. Compared with the predominantly daily or monthly fixed rates in the first batch, the second batch adopted more flexible limits and varied units. While some cities retained daily caps (e.g., Tianjin RMB 70/day for institutional care; Xiangtan RMB 80 to 100 per day for medical institutional care), many set monthly caps (e.g., Urumqi: RMB 2,152 per month for employee home care; RMB 2,008/month for institutional care), or combined daily and monthly caps (e.g., Jincheng applied daily caps for self-care and monthly caps for institutional outreach). Others introduced hourly

pricing with monthly total-hour caps (e.g., Shijingshan: RMB 90 per hour, maximum 30 hours). This diversity increased service customisation.

Third, benefit levels and differentiated targeting. The second batch showed pronounced differentiation. Institutional care rates were mostly around 70 per cent, but varied by service type, disability level, and beneficiary category. Shijingshan raised professional home care to 80 per cent while keeping family home care at 70 per cent. Panjin split severe disability into three grades with rates of 70 per cent, 60 per cent, and 50 per cent. Urumqi set different ranges for employees (70-100 per cent) and residents (55–80 per cent). Gannan based rates on the previous year's provincial average wage with a five-year increment mechanism. Some cities (e.g., Hohhot, Fuzhou) expressed differentiation indirectly via fixed amounts and beneficiary categories rather than explicit percentage rates.

Fourth, linking disability grading to payment standards. Disability grading was applied more precisely than in the first batch. For example, Panjin and Xiangtan graded severe disability into three levels with distinct daily/monthly caps; Nanning set three severe-disability levels with uniform monthly caps for institutional and home care (RMB 1,710–1,980); Hohhot differentiated not only by disability level but also by insured status (employee/resident). Gannan

indirectly reflected grading differences by linking benefits to provincial average wages and designed periodic adjustments for sustainability.

Table 18 The benefit limits and benefit levels of LTCI pilot cities (the second batch)

Pilot phrase	Pilot Cities	Benefit Limit	Benefit Level	Policy Document Number
Expansion phase	Shijingshan district of Beijing	Institutional care 90 RMB/day, professional home care 90 RMB/hour with a monthly cap of 30 hours, family home care 60 RMB/hour with a monthly cap of 30 hours.	Institutional care 70%, professional home care 80%, family home care 70%.	Jing Shi Yi Bao Fa [2020] No.16
Expansion phase	Tianjin	Institutional care 70 RMB/person/day, home care 2100 RMB/person/month.	Institutional care 70%, home care 75%.	Jin Zheng Ban Gui [2020] No.24
Expansion phase	Jincheng	Home self-care for severe disability: Level 1 - 28 RMB/day, Level 2 - 29 RMB/day, Level 3 - 30 RMB/day. Institutional home-visit care: Level 1 - 1400 RMB/month, Level 2 - 1500 RMB/month, Level 3 - 1600 RMB/month. Combined home and home-visit care: Home part - Level 1/2/3 - 14/15/16 RMB/day; Home-visit part - Level 1/2/3 - 900/1000/1100 RMB/month. Institutional care for severe disability: Level 1 - 95 RMB/day, Level 2 - 100 RMB/day, Level 3 - 105 RMB/day.	70%	Jin Shi Yi Bao Fa [2021] No.26
Expansion phase	Hohhot	Employees: Moderate disability: Institutional care 900 RMB/month, home care 750 RMB/month; Severe Level 1: Institutional care 1200 RMB/month, home care 1050 RMB/month; Severe Level 2: Institutional care 1500 RMB/month, home care 1350 RMB/month; Severe Level 3: Institutional care 1800 RMB/month, home care 1650 RMB/month. Residents: Moderate disability 600 RMB/month; Severe Level 1: 750 RMB/month; Severe Level 2: 1050 RMB/month; Severe Level 3: 1350 RMB/month.	No clear regulations	Hu Zheng Ban Fa [2020] No.31
Expansion phase	Panjin	Severe disability: Level 1 - 2350 RMB/month, Level 2 - 2010 RMB/month, Level 3 - 1680 RMB/month.	Severe disability: Level 1 - 70%, Level 2 - 60%, Level 3 - 50%.	Pan Zheng Ban Fa [2020] No.25, Pan Yi Bao [2022] No.79
Expansion phase	Fuzhou	Severely disabled older people are divided into 7 categories: Categories 1-6: 100-400 RMB/person/month; Category 7: No less than 30 RMB/person/month; Categories 2 and 3: No less than 200 RMB/person/month.	No clear regulations	Rong Yi Bao Wen [2021] No.5, Rong Min [2021] No.271
Expansion phase	Kaifeng	Institutional care 1900 RMB/person/month, home-visit care 1500 RMB/person/month, family home care 900 RMB/person/month.	Institutional care 65%, home-visit care 75%.	Bian Zheng [2020] No.36
Expansion phase	Xiangtan	Medical institution care: Disability level 2 and above 100 RMB/person/day, below level 2 80 RMB/person/day. Nursing home care: 50 RMB/person/day. Institutional home-visit care: 40 RMB/person/day.	Medical institution care 70%, nursing home care 70%, institutional home-visit care 80%.	Tan Yi Bao Fa [2021] No.1
Expansion phase	Nanning	Institutional care: Severe disability Level 3: 1980 RMB/month; Severe disability Level 2: 1860 RMB/month; Severe disability Level 1: 1710 RMB/month. Home care for all three levels: 1847 RMB/month.	Approximately 70% of the monthly fixed standard (2463 RMB)	Implementation Opinions on Deepening the Pilot of the Long-Term Care Insurance System in Nanning City (2023)
Expansion phase	Qianxinan Buyei and Miao Autonomous Prefecture	Institutional care 1000 RMB/person/month, institutional home-visit care 900 RMB/person/month, home self-care 200 RMB/person/month, combined institutional home-visit and home self-care 1100 RMB/person/month, assistive device rental 300 RMB/person/month.	300 to 1100 RMB per month	Qian Xi Nan Yi Bao Tong [2021] No.10
Expansion phase	Kunming	The calculation base is 70% of the full-caliber average monthly social wage of Yunnan Province from the previous year, with the monthly limit not exceeding 70% of the base.	70%	Kun Zheng Fa [2023] No.5
Expansion phase	Hanzhong	Medical institution care 40 RMB/bed/day, nursing institution care 36 RMB/bed/day, institutional home-visit service 800 RMB/month, home care 450 RMB/month.	450 to 1200 RMB	Hanzhong City Long-Term Care Insurance Implementation Rules (Trial)
Expansion phase	Urumqi	Employees: Home care 2152 RMB/month; Institutional care 2008 RMB/month; Institutional home-visit care 2160 RMB/month. Residents: Home care 1721 RMB/month; Institutional care 1578 RMB/month; Institutional home-visit care 1728 RMB/month	Employees 70%–100%, residents 55%–80%.	Wu Zheng Ban Gui [2021] No.1
Expansion phase	Gannan Tibetan Autonomous Prefecture	Monthly fixed standard base: 50% of previous year's provincial urban average wage; Institutional care base 50%, home care base 55%; reimbursement rate increases by 2% every 5 years, max 70%.	50% to 70%	Zhou Yi Bao Zi [2021] No.143

Overall, from 2016 to 2020, the first-batch cities made substantial progress in benefit levels, payment methods, and policy refinement: limits generally increased; pricing evolved from single daily caps to monthly, hourly, and per-service rates; reimbursement rates increasingly favoured employees and those with severe disabilities; and service types expanded to include community care, assistive devices, and dementia-specific services. The second batch showed four distinct features: More diverse service formats, covering institutional, home, outreach, combined, and assistive-device services. Greater flexibility in pricing, combining daily, monthly, and hourly units. Clearer differentiation in benefit rates (by disability level, insured status, and service type). Introduction of dynamic adjustment mechanisms, such as wage-based indexing and scheduled rate increases, to support fund sustainability.

These developments indicate that the expansion phase placed stronger emphasis on personalisation, precision, and long-term viability, offering richer model references for nationwide implementation.

6.4 Disability Assessment

This section will discuss the disability assessment policy of LTCI pilot system from the following two aspects: the institutions of disability assessment participation and the assessment criteria/tools.

In the area of disability assessment, China's LTCI pilot cities have gradually transitioned from decentralised to unified standards. When the pilot programme began in 2016, most cities determined eligibility primarily on the basis of an assessment of the individual's level of physical and/or cognitive impairment. They stipulated that individual who became disabled due to ageing, illness, or injury, required treatment lasting at least six months, and met disability standards based on daily activity assessments or comprehensive evaluations were eligible for LTCI benefits. Such individuals needed to be unable to care for themselves and require LTC.

According to *Annual Report on China's Healthcare Development (2020)*, most regions relied on the Barthel Index (ADL Scale) to evaluate disability levels, using scores below a predefined threshold as the eligibility criterion. However, there was no uniform standard for these thresholds (Zheng and Shen, 2020). Many regions set the standard at below 60 points, while some cities, such as Chengde (Cheng Yi Bao Zi [2021] No.50) and Jingmen¹⁹, required a score below 40. Furthermore, Qingdao incorporated the Mini-Mental State Examination (MMSE) (Qing Yi Bao Fa [2021] No.12), while Changchun (Ji Yi Bao Lian [2021] No.7) included cancer patients with a Karnofsky Performance Status (KPS) score below 50. Shanghai (Hu Fu Ban Gui [2021] No.15) developed its own *Elderly Care Needs Assessment Survey Form*, which scored

¹⁹ *Jingmen City Long-Term Care Insurance Measures (Trial) 2016*

individuals on disease dimensions and then classified them into six care levels based on self-care ability dimensions.

Given that Shanghai's criteria are based on its own unified needs assessment standard for older people's care, it is useful to outline how this grading system works and how it differs from the national disability grading standard. In Shanghai's unified needs assessment standard for older people's care (used for determining eligibility for LTCI) functional status is graded into seven levels, from 'normal' to 'care level six' (Wan et al., 2024; CLIP, 2023). Level 1 indicates the most severe disability, with higher levels reflecting lighter care needs. Under the current policy, LTCI benefits are available to insured individuals aged 60 or above whose assessment falls between levels 2 and 6. This effectively targets those with moderate to mild disability, while excluding the most severely disabled (level 1), who are generally covered by other welfare schemes such as severe disability nursing subsidies. Compared with the national disability grading standard, which has six levels (0-5) and focuses primarily on severe disability (levels 3-5) for LTCI eligibility, the Shanghai system features broader coverage and a more detailed set of 52 secondary indicators, in contrast to the national standard's 17 (Wan et al., 2024). Its assessment encompasses activities of daily living (ADL), instrumental ADL, cognitive ability, and disease information (Wan et al., 2024).

To better understand the policy implications of variations in LTCI eligibility, it is essential to clarify how the national standard defines *moderate* and *severe* disability, as these definitions largely determine eligibility thresholds in most LTCI pilot programmes. The *Long-Term Care Disability Assessment Standards (Trial)* (Health Insurance Bureau Office and Ministry of Civil Affairs Office, 2021), issued in July 2021, established a unified framework for disability evaluation. Prior to this, although the LTCI pilot programme had expanded by 2020, no national standard for disability assessment existed. The 2021 standard mandated that the 14 newly added pilot sites adopt the guidelines immediately, while the original 15 pilot cities were required to align with the standard within two years.

The standard defines disability using a comprehensive assessment across three primary dimensions: Activities of Daily Living (ADL), cognitive capacity, and sensory/perceptual and communication ability. It further specifies 17 secondary indicators and divides disability into six grades: Level 0 Essentially normal, Level 1 Mild disability, Level 2 Moderate disability, Level 3 Severe disability – Grade I, Level 4 Severe disability – Grade II, Level 5: Severe disability – Grade III.

Moderate disability (Level 2) is characterised by partial dependence in ADL, whereby the individual requires assistance with some activities yet retains a

certain degree of self-care capacity. Cognitive and sensory/perceptual or communication abilities may be mildly to moderately impaired, but not to the extent of complete dependence on others. Assessment results typically indicate a need for intermittent or partial assistance in daily life.

Severe disability (Levels 3–5) is further classified as follows:

Grade I (Level 3): Severe ADL limitation, with most activities requiring assistance, though minimal self-care capacity may remain.

Grade II (Level 4): Virtually complete loss of self-care capacity, with at least two of the three assessed dimensions severely impaired, requiring full-time daily care.

Grade III (Level 5): Complete loss of self-care capacity, combined with severe cognitive or sensory/perceptual and communication impairments, necessitating 24-hour comprehensive care and nursing.

Despite the 2021 standard (Health Insurance Bureau Office and Ministry of Civil Affairs Office, 2021), implementation across pilot cities remains heterogeneous.

According to Dai (2024), as of the end of 2023, among China's two batches of LTCI pilots (covering 49 cities and regions), 24 cities adopted the Barthel Index, an ADL-based capability scoring system, including Changchun, Nantong, and Chongqing. Nanning used the Katz Index, another ADL-based tool. Eleven cities, such as Shanghai and Qingdao, developed locally customised standards,

while eight cities, including Hunchun and Zaozhuang, implemented the national 2021 standard directly. The remaining pilots did not specify a formalised assessment tool.

The classification of entities involved in disability assessment, as outlined in policy documents (CLIP, 2023), is as follows:

1. Medical expert teams – Committees or expert pools established by medical insurance departments and relevant government agencies (e.g., civil affairs, finance, health commissions) responsible for conducting or supervising evaluations in accordance with established policies and standard.
2. Third-party assessment agencies – Independent medical institutions contracted by medical insurance departments to carry out disability assessments. Such institutions must meet defined criteria and possess relevant expertise to ensure accurate and impartial evaluation.
3. Commercial insurance companies – Private insurers that may conduct assessments directly or commission third-party agencies, particularly where private funding or management of LTC services is involved.
4. Labour ability appraisal agencies – Specialised bodies assessing impairment in work capacity resulting from occupational injury, illness, or other causes. Their evaluations primarily influence workers' compensation, disability classification, and associated benefits.
5. Medical insurance handling agencies (医保经办机构), which serve as the

operational arms of medical insurance departments and may directly organise or coordinate disability assessments.

From Tables 19 and 20, it can be observed that medical expert teams represent many institutions involved in disability assessment, with a total of 14 pilot cities adopting this approach, predominantly from the second batch of pilot cities. Following this, third-party assessment agencies are utilised by 8 pilot cities, of which 7 belong to the first batch. Meanwhile, commercial insurance companies and labour ability appraisal agencies are the least represented, with only 6 and 1 pilot cities employing these methods, respectively.

The four types each have their own strengths and weaknesses. The medical expert team involves experts and healthcare professionals directly participating in disability assessment, with personnel selected by social security departments (Liao et al., 2024; Cao and Li, 2020). These departments collaborate with the medical expert team to complete the preliminary review and screening of beneficiaries. Under this management mechanism, the social security department effectively assumes the responsibility for disability assessment, which acts as a counterbalance to third-party administrative agencies and helps prevent disputes over disability evaluation (Liao et al., 2024). However, during the pilot phase, drawing professional staff from medical institutions increased the workload of these healthcare professionals (Cao and

Li, 2020). Combined with the relatively low remuneration for disability assessment, this has resulted in challenges in maintaining the stability of expert teams (Wu et al., 2021; Han and Wang, 2024). This has resulted in significant deficiencies in assessment efficiency, with frequent issues of assessors being unmotivated, underperforming, or absent from their roles (Wu et al., 2021).

In the model of establishing third-party assessment institutions, the LTCI administrative agency collaborates with these institutions to complete the preliminary review and screening of beneficiaries (Cao and Li, 2020). The role of social security departments is limited to supervising and auditing third-party institutions (Cao and Li, 2020). This model creates a system of checks and balances among the LTCI administrative agency, the third-party assessment institution, and the social security regulatory body (Liao et al., 2024; Yu et al., 2023). It ensures that the results of disability assessments are as objective and impartial as possible, while keeping oversight and management costs relatively low. However, due to the limited number of specialised institutions capable of conducting disability assessments, a competitive market supply environment has not yet emerged during the pilot phase. To encourage and support the development of third-party assessment institutions, preferential policies from the government are necessary (Liao et al., 2024; Yu et al., 2023; Han and Wang, 2024).

The third model, where commercial insurance companies act as LTCI administrative agencies, can be regarded as a form of PPP within the LTCI pilot system. Under this model, commercial insurance companies directly participate in the disability assessment process, while the social security management departments oversee the operations of these companies (Yu et al., 2023; Zheng and Shen, 2020). Oversight is maintained through mechanisms such as total expenditure control, periodic or random inspections, and re-evaluation procedures to ensure the objectivity and fairness of the disability assessment process. This model features low administrative costs and leverages the PPP framework to establish a fast and efficient disability assessment and management system. However, the profit-driven nature of commercial insurance companies poses risks, as they may under-assess the disability levels of insured individuals to minimize operational costs, potentially harming the rights of policyholders (Liao et al., 2024; Yu et al., 2023). To mitigate such risks, some pilot regions have established LTCI qualification assessment committees or joint meeting systems in collaboration with labour capacity appraisal institutions, providing a third-party oversight mechanism (Zheng and Shen, 2020; Cao and Li, 2020). For example, Anqing City has implemented this approach. Similarly, some pilot cities have gone a step further by involving labour capacity appraisal institutions directly in the disability assessment process. This approach, adopted by cities like Shihezi, maintains low management costs and capitalises on the expertise of labour capacity appraisal

institutions. However, cross-departmental collaboration often hinders the creation of an efficient and interactive supervisory mechanism.

Table 19 Institutions for disability assessment of LTCI pilot cities (the first batch)

Pilot phrase	Pilot Cities	Participating Institutions	Policy Document Number	Pilot phrase	Pilot Cities	Participating Institutions	Policy Document Number
Initial stage	Chengde	Labour ability appraisal agency	Cheng Shi Zheng Zi [2016] No.156	Expansion phase	Chengde	Third-party assessment agency	Cheng Yi Bao Zi [2021] No.50
Initial stage	Changchun	Medical insurance handling agencies	Chang Fu Ban Fa [2015] No.3 and Chang Ren She	Expansion phase	Changchun	Third-party assessment agency	Ji Yi Bao Lian [2021] No.7
Initial stage	Qiqihar	Labour ability appraisal agency	Qi Zheng Ban Gui [2017] No.15	Expansion phase	Qiqihar	Medical expert team	Qi Yi Bao Fa [2023] No.3
Initial stage	Shanghai	Third-party assessment agency	Hu Fu Fa [2016] No.110	Expansion phase	Shanghai	Third-party assessment agency	Hu Fu Ban Gui [2021] No.15
Initial stage	Nantong	Medical insurance handling agencies	Opinions on Establishing the Basic Care Insurance	Expansion phase	Nantong	Third-party assessment agency	Tong Yi Bao Fa [2022] No.42
Initial stage	Suzhou	Not specified in the document	Su Fu [2017] No.77	Expansion phase	Suzhou	Commercial insurance company	Su Yi Bao Dai Yi [2023] No.7
Initial stage	Ningbo	Medical expert team	Ningbo City Pilot Plan for Long-Term Care Insurance System 2016 (Draft for	Expansion phase	Ningbo	Medical expert team	Yong Zheng Ban Fa [2022] No. 39
Initial stage	Anqing	Medical insurance handling agencies	Yi Zheng Ban Mi [2017] No.5	Expansion phase	Anqing	Commercial insurance company	Yi Yi Bao Fa [2020] No.1
Initial stage	Shangrao	Medical expert team	Rao Ren She Zi [2017] No.162	Expansion phase	Shangrao	Commercial insurance company	Rao Fu Zi [2019] No.33
Initial stage	Qingdao	Not specified in the document	Qing Zheng Ban Zi [2012] No.91	Expansion phase	Qingdao	Third-party assessment agency	Qing Yi Bao Fa [2021] No.12
Initial stage	Jingmen	Medical insurance handling agencies	Jingmen City Long-Term Care Insurance Measures (Trial) 2016	Expansion phase	Jingmen	Medical expert team	Operational Procedures for Long-Term Care Insurance Administration Services in Jingmen City (Trial)
Initial stage	Guangzhou	Labour ability appraisal agency	Sui Ren She Zi [2017] No.6	Expansion phase	Guangzhou	Third-party assessment agency	Sui Yi Bao Gui Zi [2020] No.11
Initial stage	Chongqing	Third-party assessment agency	Yu Ren She Fa [2017] No.280	Expansion phase	Chongqing	Third-party assessment agency	Yu Yi Bao Fa [2021] No.63
Initial stage	Chengdu	Medical expert team	Cheng Ren She Fa [2017] No.20	Expansion phase	Chengdu	Medical expert team	Cheng Yi Bao Fa [2022] No.16 and No.17, Notice on Including All Moderately Disabled Individuals in the Long-Term Care Insurance System and Related Matters (2023)
Initial stage	Shihezi	Not specified in the document	Shi Shi Fa [2017] No.16	Expansion phase	Shihezi	Labour ability appraisal agency	Shi Shi Fa [2017] No.16

Table 20 Institutions for disability assessment of LTCI pilot cities (the second batch)

Pilot phase	Pilot Cities	Participating Institutions	Policy Document Number
Expansion phase	Shijingshan district of Beijing	Third-party assessment agency	Jing Shi Yi Bao Fa [2020] No.16
Expansion phase	Tianjin	Commercial insurance company	Jin Yi Bao Gui Zi [2021] No.3
Expansion phase	Jincheng	Commercial insurance company	Jin Shi Zheng Ban Fa [2020] No.14
Expansion phase	Hohhot	Medical expert team	Notice on Issuing the Interim Regulations for the Management of Long-Term Care Insurance Assessors and Assessment Expert Database in Hohhot (2023)
Expansion phase	Panjin	Medical expert team	Pan Yi Bao [2021] No.10
Expansion phase	Fuzhou	Medical expert team	Rong Yi Bao Wen [2021] No.5, Rong Min [2021] No.271
Expansion phase	Kaifeng	Medical expert team	Bian Zheng [2020] No.36
Expansion phase	Xiangtan	Medical expert team	Tan Yi Bao Fa [2021] No.1
Expansion phase	Nanning	Commercial insurance company	Interim Measures for the Management of Long-Term Care Insurance Administrating Institutions in Nanning City (2022)
Expansion phase	Qianxinan Buyei and Miao Autonomous Prefecture	Medical expert team	Qian Xi Nan Fu Ban Fa [2022] No.23
Expansion phase	Kunming	Medical expert team	Kun Zheng Fa [2023] No.5
Expansion phase	Hanzhong	Medical expert team	Hanzhong City Long-Term Care Insurance Implementation Rules (Trial)
Expansion phase	Urumqi	Medical expert team	Wu Zheng Ban Gui [2021] No.1
Expansion phase	Gannan Tibetan Autonomous Prefecture	Medical expert team	Zhou Yi Bao Zi [2021] No.143

From the perspective of changes observed during the expansion phase, the first cohort of LTCI pilot cities displayed a clear tendency towards diversification and market-orientation in the selection of institutions participating in disability assessment. First, the proportion of third-party assessment agencies increased markedly. Second, commercial insurance companies began to enter the disability assessment field. Meanwhile, certain cities shifted during the expansion phase to a model led by medical expert teams, thereby enhancing both the professional medical dimension and the precision of assessments.

A comparison of the institutions involved in disability assessment between the first and second cohorts of LTCI pilot cities reveals notable differences in the types and distribution of participating organisations. In the expansion phase of the first cohort, the institutional mix was more diverse, encompassing third-party assessment agencies, commercial insurance companies, medical expert teams, and labour ability appraisal agency, with third-party agencies and commercial insurance companies holding a substantial share. By contrast, the expansion phase of the second cohort exhibited a pronounced concentration towards medical expert teams, with the vast majority of the fourteen newly added pilot cities (over 70 per cent) opting for such teams.

This divergence reflects the fact that, during the expansion phase, the first cohort was more inclined to explore diversified and market-oriented pathways, fostering competition and complementarity among different types of institutions. Whereas the second cohort relied more heavily on medical expertise, emphasising the technical and clinical accuracy of assessments, with comparatively limited market-oriented participation.

6.5 Public-Private Partnerships (PPPs)

As of February 2024, among the first and second batches of 29 LTCI pilot cities nationwide, all but Shanghai have engaged commercial insurance institutions in the administration of LTCI services (Xiao et al., 2024). In terms of participating

entities, large commercial insurance companies, such as China Life, PICC, Taikang Pension, and China Pacific Life, have taken the lead, managing LTCI administration in more than 10 pilot cities each (Xiao et al., 2024). Meanwhile, some regional commercial insurance companies, including Dongwu Life, Zhonglu Property, Jintai Property, and Chengtai Property, have also secured opportunities to administer LTCI services, leveraging their specialised offerings and local advantages (Xiao et al., 2024).

However, classification criteria for the PPPs vary significantly. The Yunnan Provincial Healthcare Security Administration reprinted an article which classified operational models under the PPP framework according to three dimensions: the degree of risk-sharing, variations in service content, and differences in administrative structures (China Medical Insurance, 2023). From the degree of risk-sharing, the models can be divided into three types (China Medical Insurance, 2023).

First, the risk-sharing model involves allocating LTCI funds to commercial insurance companies, which bear the risk of overspending. This model is adopted by 65 per cent of pilot cities. Second, the entrusted management model also allocates LTCI funds to commercial insurance companies but does not require them to bear overspending risks. Third, the service-only model neither allocates LTCI funds to commercial insurance companies nor requires

them to assume overspending risks. Regarding variations in service content, models vary in the scope of delegated services, which may include policy promotion, benefit applications, disability assessments, fund payment and review, record management, and information system development (China Medical Insurance, 2023). Most pilot cities, including Chengdu in Sichuan Province, Nantong in Jiangsu Province, and Kunming in Yunnan Province, adopt the full-process entrustment model, which covers the entire range of services, while a smaller number of cities use partial-process entrustment, outsourcing only specific tasks. Finally, the operational models classified by the administrative structure are based on two main approaches: shared quota co-insurance and regional co-insurance (China Medical Insurance, 2023). The quota-sharing co-insurance divides commercial insurance companies into primary and secondary contractors, with specific roles typically determined during bidding. The primary contractors, under the guidance of the healthcare security department, establishes a shared management office to coordinate with the department and oversee operational tasks, like Tianjin and Nantong. The regional co-insurance, on the other hand, allocates responsibilities based on administrative jurisdictions, with different commercial insurance companies independently managing operations in their respective areas. Municipal and district-level healthcare security departments coordinate horizontally with commercial insurance companies of their respective areas, like Qingdao in Shandong Province, Chengdu in Sichuan Province, and Guangzhou in

Guangdong Province.

From the perspective of the administrative structures, Xiao et al. (2024) further divide the operational models into four specific types: exclusive administration, regional co-insurance, quota-sharing co-insurance, and process-based co-insurance. The exclusive administration model refers to the delegation of LTCI services to a single commercial insurance company for independent administration (Xiao et al., 2024). In contrast, regional co-insurance, quota-sharing co-insurance, and process-based co-insurance models involve dividing the administrative responsibilities by geographical areas, insurance shares, or specific process stages, with two or more commercial insurance companies jointly managing the services (Xiao et al., 2024). Currently, many pilot cities, such as Chengde, Changchun, Ningbo, and Shangrao, adopt the regional co-insurance model. Some pilot cities employ a combination of different administration models (Xiao et al., 2024). For instance, Nantong combines regional and quota-sharing co-insurance by dividing the service areas into two large regions each with three designated administrative institutions. These institutions then determine the specific scope of services and business volume within their designated shares. Similarly, Guangzhou utilises a combination of process-based and regional co-insurance models and separates the bidding for basic agency services and disability level assessment services. Each stage involves two to four administrative institutions, with the service areas

determined by the regional divisions corresponding to each specific process stage.

In contrast, Dai et al. (2022) categorised the PPP models in pilot cities based on the fund management model of LTCl as a criterion. They divide the PPP models into two types: the first involves medical insurance administrative agencies operating the system, as seen in cities like Qiqihar, Shihezi, and Changchun; the second involves medical insurance administrative agencies overseeing the system while entrusting the management to commercial insurance companies, as seen in cities like Hanzhong, Qingdao, Nantong, and Suzhou.

While the aforementioned studies (e.g., China Medical Insurance (2023); Xiao et al. (2024), Dai et al. (2022)) have provided detailed and multi-dimensional classifications of PPP operational models in China's LTCl pilot cities, from risk-sharing arrangements to service scope and administrative structures, these approaches vary in criteria and granularity, leading to inconsistencies in categorisation across regions and authors. To enable a more streamlined comparative analysis, this chapter adopts a synthesised framework that categorises the PPP models in China's LTCl pilot programmes into three types based on the level of involvement of commercial insurance companies (Lu, 2021; Zhang et al., 2018a). The three models are: government purchasing +

commercial insurance companies service model, government entrusts + commercial insurance companies agent model, and government provides subsidy + commercial insurance companies operate model.

Distinct from the first two models, the third model places almost all LTCI responsibilities on commercial insurance companies. These responsibilities include care service management, administration of operations, and fund collection (tasks typically found in the first two models). Moreover, under this model, commercial insurance companies directly oversee LTCI fund investment and operations. As the first region in China to introduce a commercial insurance-based model for LTCI, Haidian District of Beijing is universally recognised in academic discussions as an example of the government provides subsidy + commercial insurance companies operate model (Lu, 2021).

However, due to the fragmented nature of China's LTCI system and significant differences in pilot program implementation (Zhou and Dai, 2021), classification outcomes often vary across studies, even for the first two models. For example, Xiao et al. (2024) classify Suzhou and Qingdao into the government entrusts + commercial insurance companies agent model, while Lu (2021) and Du (2023) place Suzhou under the government purchasing + commercial insurance companies service model and Qingdao under the government entrusts + commercial insurance companies agent model.

This chapter posits that the observed variation in classifications under the same perspective likely arises from differing standards among scholars in assessing the extent of commercial insurance companies' involvement in fund management within the PPP models of various pilot cities. Most scholars differentiate the two PPP models ('service model' and 'agent model') based on whether commercial insurance companies are entrusted with LTCI fund management responsibilities (Du, 2023; Lu, 2021; Peng, 2022; Xiao et al., 2024; Xiao et al., 2023; Zhang et al., 2018a). Under the service model, commercial insurance companies are limited to basic administrative tasks, such as disability assessments, policy promotion and consultation, information system development and maintenance, and dispute resolution, without involvement in fund collection or management (Du, 2023; Lu, 2021; Xiao et al., 2024; Zhang et al., 2018a). Conversely, in the agent model, in addition to handling basic administrative tasks, commercial insurance companies also engage in fund management activities (Du, 2023; Lu, 2021; Xiao et al., 2024; Zhang et al., 2018a).

For instance, Du (2023) defines 'fund management' as encompassing fund settlement and payment, investment operations, and fund collection. Similarly, Xiao et al. (2024) group insurance companies responsible for expense audits under the service model, while those with fund collection, settlement and

payment, and operational management responsibilities are classified under the agent model. Based on this definition, Xiao et al. (2024) categorise Qingdao and Suzhou as belonging to the same group agent model. Lu (2021) further nuances this classification by considering the scope of authority. Although both the Suzhou and Qingdao pilot programs assign fund-related functions to commercial insurance companies, Lu (2021) notes that the scope of authority in fund management is broader for Qingdao than Suzhou, leading to their placement in different categories. However, Zhang et al. (2018a) differentiate fund collection as a distinct responsibility, categorising it separately under the operate model while including other fund management functions within the agent model.

Therefore, to avoid confusion, this chapter refines the functions assigned to commercial insurance companies and the tasks they participate in within the LTCI pilot system, based on the CLIP (2023) database. These functions and tasks are summarised into 12 specific items, as detailed in Table 21, with an explanation of each item provided below:

1. Policy Promotion and Consultation: it includes policy dissemination, consultation services, and educational training.
2. Disability Assessment and Management: it encompasses the assessment of disability levels, organisation of assessments, management of assessment

results, as well as pre-assessment reviews and public announcements.

3. Agreement Signing and Management: management of agreements with designated caregiving service institutions and assessment organisations.
4. Service Implementation and Supervision: it covers quality monitoring of services, supervision and management of designated institutions and care providers, as well as satisfaction surveys for caregiving services.
5. Fee Review and Payment Settlement: it involves the review of caregiving expenses, benefit payments, and the process of financial settlement and payment.
6. Information System Development and Maintenance: development, construction, and maintenance of specialised information systems, as well as the integration with other relevant systems.
7. Personnel Training and Capacity Building: training and guidance for caregiving personnel, assessors, and individual service providers.
8. Records Management and Information Protection: it involves the management of business records, electronic archiving, and protection of information security.
9. Auditing, Investigation, and Dispute Resolution: it covers auditing and inspection, dispute resolution, and handling complaints related to the quality of caregiving services.
10. Commercial Insurance Product Development: it involves the development and promotion of commercial insurance products related to LTCI.
11. Fundraising and Fund Management: covers fund collection and operational

management.

12. Special Project Support: it includes the distribution of small grants, annual performance evaluations, and the use of special funds for specific projects.

Table 21 Participating contents of commercial insurance companies

Batch	Pilot cities	Policy Promotion and Consultation	Disability Assessment and Management	Agreement Signing and Management	Service Implementation and Supervision	Fee Review and Payment Settlement	Information System Development and Maintenance	Personnel Training and Capacity Building	Records Management and Information Protection	Auditing, Investigation, and Dispute Resolution	Commercial Insurance Product Development	Fundraising and Fund Management	Special Project Support
The first batch	Chengde	✓	✓		✓	✓	✓	✓	✓	✓			
The first batch	Changchun	✓	✓	✓	✓	✓		✓					
The first batch	Qiqihar		✓			✓	✓			✓			
The first batch	Shanghai										✓		
The first batch	Nantong		✓			✓	✓			✓			
The first batch	Suzhou		✓	✓	✓	✓	✓						
The first batch	Ningbo	✓	✓	✓	✓	✓		✓		✓			
The first batch	Anqing		✓			✓	✓			✓			
The first batch	Shangrao		✓			✓							✓
The first batch	Qingdao	✓	✓	✓	✓	✓	✓			✓			
The first batch	Jingmen												
The first batch	Guangzhou		✓		✓				✓				
The first batch	Chongqing	✓	✓		✓	✓		✓	✓				
The first batch	Chengdu	✓	✓		✓	✓							
The first batch	Shihezi										✓		
The second batch	Shijingshan district of Beijing	✓	✓	✓	✓	✓	✓	✓	✓				
The second batch	Tianjin	✓	✓	✓		✓		✓	✓				
The second batch	Jincheng	✓	✓	✓	✓	✓		✓	✓				
The second batch	Hohhot		✓		✓	✓							
The second batch	Panjin	✓	✓		✓		✓						
The second batch	Fuzhou	✓	✓	✓	✓	✓	✓						
The second batch	Kaifeng												
The second batch	Xiangtan	✓	✓	✓	✓	✓	✓						✓
The second batch	Nanning	✓	✓	✓	✓	✓	✓	✓		✓			
The second batch	Qianxinan Buyei and Miao Autonomous Prefecture	✓	✓			✓		✓		✓			
The second batch	Kunming		✓										✓
The second batch	Hanzhong	✓	✓	✓	✓	✓	✓	✓	✓	✓			
The second batch	Urumqi												
The second batch	Gannan Tibetan Autonomous Prefecture	✓		✓	✓	✓		✓					
Other	Haidian district of Beijing											✓	

This chapter adopts the extent of involvement of commercial insurance companies in the review of caregiving expenses, benefit payments, and the process of financial settlement and payment as the primary evaluation criterion. Based primarily on the policy documents of the pilot regions, five pilot cities (Shanghai, Guangzhou, Shihezi, Panjin, and Kunming) without explicit provisions on the involvement of commercial insurance companies in fee review and payment settlement are categorised under the government purchasing + commercial insurance companies service model. Twenty-one pilot cities, where commercial insurance companies are explicitly assigned these functions, are classified under the government entrusts + commercial insurance companies agent model. The remaining three cities (Jingmen, Kaifeng, Urumqi), with unclear levels of involvement, are excluded from classification.

Based on the number of projects commercial insurance companies are involved in across pilot cities, the involvement levels are categorised as ‘deep involved’, ‘intermediate involved’, and ‘unclear’ (Table 22). Cities with five or fewer projects are classified as intermediate involved, while those with more than five projects are classified as deep involved. For the remaining three cities (Urumqi, Kaifeng, and Jingmen) policy documents issued at the local level only specify that qualified commercial insurance companies are entrusted by municipal healthcare security departments to participate in the administration of LTCI

through service procurement. These documents do not provide detailed lists of the projects involved, leading to their classification as unclear.

Table 22 Involvement level of commercial insurance companies

Batch	Pilot cities	Count	Involvement level	Policy document number
The first batch	Chengde	8	Deep	Cheng Yi Bao Zi [2021] No.50
The first batch	Changchun	6	Deep	Ji Yi Bao Lian [2021] No.7
The first batch	Qiqihar	4	Intermediate	Qi Zheng Ban Gui [2021] No.1, Qiqihar City Long-Term Care Insurance Implementation Rules (Trial)
The first batch	Shanghai	1	Intermediate	Hu Fu Ban Gui [2021] No.15
The first batch	Nantong	4	Intermediate	Tong Zheng Fa [2015] No.73
The first batch	Suzhou	5	Intermediate	Su Fu [2017] No.21, Su Fu [2020] No.10
The first batch	Ningbo	7	Deep	Yong Zheng Ban Fa [2017] No.115, Yong Zheng Ban Fa [2022] No. 39
The first batch	Anqing	4	Intermediate	Yi Ren She Mi [2017] No.5
The first batch	Shangrao	3	Intermediate	Rao Fu Zi [2019] No.33, Rao Ren She Zi [2019] No.41
The first batch	Qingdao	8	Deep	Qing Zheng Fa [2021] No.6
The first batch	Jingmen	0	Unclear	Jingmen City Long-Term Care Insurance Measures (Trial) 2016
The first batch	Guangzhou	3	Intermediate	Sui Yi Bao Gui Zi [2020] No.10, Sui Ren She Gui Zi [2017] No. 6
The first batch	Chongqing	6	Deep	Yu Ren She Fa [2017] No.280, Yu Yi Bao Fa [2021] No.63
The first batch	Chengdu	4	Intermediate	Cheng Yi Bao Fa [2022] No.10
The first batch	Shihezi	1	Intermediate	Shi Shi Fa [2017] No.16
The second batch	Shijingshan district of Beijing	8	Deep	Beijing Shijingshan District Expands the Pilot Long-Term Care Insurance System Commercial Insurance Agency Management Measures (Trial)
The second batch	Tianjin	6	Deep	Jin Yi Bao Gui Zi [2021] No.3
The second batch	Jincheng	7	Deep	Jin Shi Yi Bao Fa [2021] No.1
The second batch	Hohhot	3	Intermediate	Hu Yi Bao Fa [2021] No.10
The second batch	Panjin	4	Intermediate	Pan Zheng Ban Fa [2020] No.25
The second batch	Fuzhou	6	Deep	Rong Yi Bao Wen [2021] No.5
The second batch	Kaifeng	0	Unclear	Bian Zheng [2020] No.36
The second batch	Xiangtan	7	Deep	Tan Yi Bao Fa [2021] No.1
The second batch	Nanning	8	Deep	Nan Fu Gui [2021] No.3
The second batch	Qianxinan Buyei and Miao Autonomous Prefecture	5	Intermediate	Qianxinan Prefecture Long-Term Care Insurance Trial Implementation Rules
The second batch	Kunming	2	Intermediate	Kun Zheng Fa [2023] No.5
The second batch	Hanzhong	9	Deep	Hanzhong City Long-Term Care Insurance Implementation Rules (Trial)
The second batch	Urumqi	0	Unclear	Wu Zheng Ban Gui[2021] No.1
The second batch	Gannan Tibetan Autonomous Prefecture	5	Intermediate	Zhou Yi Bao Zi [2021] No.143

Based on the task distribution data in Table 21, it can be observed that there are marked differences among the pilot cities in terms of the functional scope of commercial insurance institutions' participation. These differences closely correspond to the three PPP models outlined earlier: (1) the government purchasing + commercial insurance companies service model; (2) the government entrusts + commercial insurance companies agent model; and (3) the government provides subsidy + commercial insurance companies operate model.

Generally speaking, cities that take on a broader range of functions (classified as 'deep involvement') are more likely to adopt the government entrusts + commercial insurance companies as agent model. For instance, Qingdao and Chongqing from the first batch of pilot cities fall into this category. In contrast, those classified under the government purchasing + commercial insurance companies service model are all cases of 'intermediate involvement'. This is in line with the earlier observations of Du (2023) and Lu (2021), who argue that whether an institution undertakes fund collection, settlement, and operation is the key criterion distinguishing the service-type from the agent-type model.

From the perspective of batch distribution, the second batch of pilot cities generally displays broader functional coverage, particularly with a higher proportion of participation in 'policy promotion and consultation', 'agreement

management', 'service supervision', and 'personnel training and capacity building', whereas the first batch is more concentrated on basic service functions. This may reflect that with the accumulation of experience over time, their levels of participation and functional responsibilities in the system have deepened. In other words, this demonstrates a shift from relatively basic functions toward more comprehensive and complex roles.

In addition, certain cities demonstrate 'hybrid' characteristics. For example, Nantong undertakes disability assessment, cost settlement, and fund management, yet has only limited involvement in service supervision and agreement management. This may correspond to a 'regional co-insurance + partial process outsourcing' model. Such cases suggest that, even within the same model framework, there remains substantial local variation in functional allocation.

6.6 Chapter Summary and Synthesis of Key Findings

This chapter has conducted a structured comparative policy review of the evolution of China's LTCI pilot system between 2016 and 2020 across its four core dimensions: financing mechanisms, benefit design, disability assessment, and PPPs.

The structured comparative analysis yields several key findings that form the empirical basis for addressing research question one (hereafter RQ1) in Chapter One. It reveals a process of significant yet fragmented policy innovation, characterised by: (1) substantial regional variation in instrument design and implementation, reflecting the dynamic interplay between central policy frameworks and local adaptation; (2) the emergence of distinct PPP models, each with unique governance implications and challenges for service delivery; and (3) tensions between policy goals of expansion, fiscal sustainability, and benefit standardisation. These findings will be further explored in Sections 8.2 and 8.4, where they are situated within the broader theoretical and policy context and synthesised with existing literature to critically examine their implications.

In addition, Chapter Six provides the foundational institutional context and real-world policy landscape that the quantitative modelling in Chapter Seven must account for. The regional disparities and design choices documented here directly inform the scenarios and indicators used in the fiscal projections. The following chapter (Chapter Seven) builds upon this institutional groundwork by employing quantitative models to project the fiscal implications of scaling up the LTCI system, thus addressing RQ2 and RQ3.

CHAPTER SEVEN: QUANTITATIVE FINDINGS

7.1 Overview

This chapter presents both historical data on fiscal subsidies in pilot regions and model-based projections aimed at assessing the fiscal sustainability of a nationwide expansion of the long-term care insurance (LTCI) pilot system. The data were collected from a combination of municipal, provincial, and national official statistical sources, covering demographic and economic indicators relevant to the LTCI pilots. The projections utilise the GM (1,1) grey forecasting model and a cell-based aggregate projection model, focusing on the design and targeting of government subsidies for LTCI financing, including subsidy scope (eligible populations) and types (fixed-sum, proportional, and mixed). To evaluate the future fiscal pressure of LTCI policy expansion, this chapter projects the government subsidy amounts from 2025 to 2035 and assesses this pressure by calculating the ratio of these projected subsidies to the local general public budget revenue (GPBR), termed the subsidies-to-GPBR ratio.

The chapter is organised as follows: Section 7.2 presents the data filtering and projection process, as well as model validation results. Section 7.3 outlines the projection outcomes, including the estimated subsidised population, total projected fiscal subsidies, GPBR, and the subsidies-to-GPBR ratio. Section 7.4 provides a summary. These findings form the empirical foundation for the discussion in Chapter Eight.

7.2 Data Screening and Model Validation

Figure 13 illustrates the overall projection process for estimating China's government fiscal subsidies in the financing stage of LTCI over the period 2025–2035. The process begins with the collection and screening of two key datasets: insured population and GPBR. After validating data quality and selecting usable years (2015-2023) by city, the GM (1,1) grey forecasting model is applied to project future values of both variables. Based on the projection results, a cell-based aggregate projection model is then used to estimate the total amount of government subsidies for LTCI financing. Lastly, the subsidies-to-GPBR ratio is calculated to assess the fiscal pressure in relative terms.

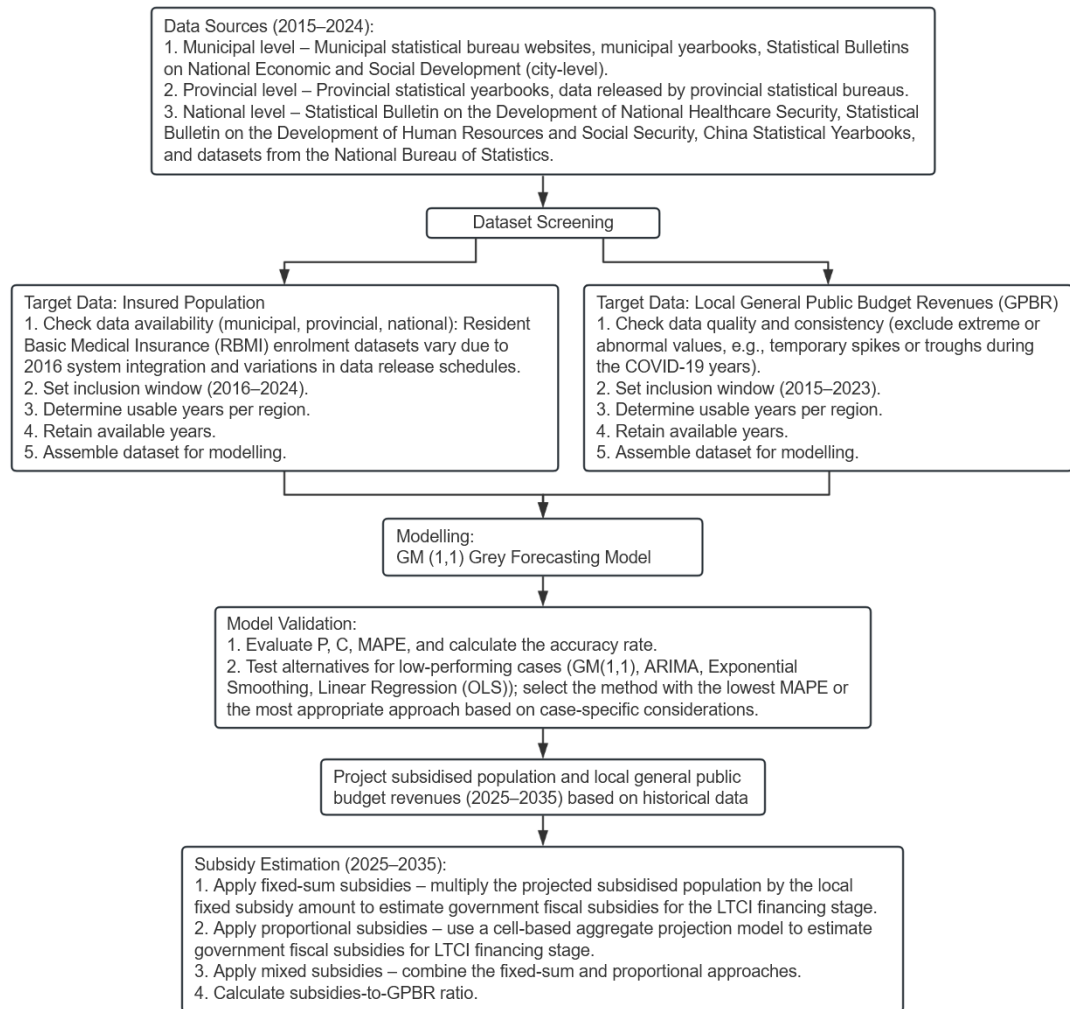


Figure 13 Projection steps

The projection covering the period from 2025 to 2035 is divided into two components: the projection of the subsidised population and the projection of general public budget revenues. The performance of the GM (1,1) model was evaluated using standard statistical metrics widely adopted in grey forecasting validation (Gao et al., 2017; Li and Liu, 2022; Liu et al., 2024; Pan et al., 2021b). These metrics, along with their interpretive thresholds, are summarised in Table 23.

Table 23 Evaluation metrics and thresholds for GM (1,1) model validation

	Criterion	Interpretation
Small Error Probability (P)	$P \geq 0.95$ (Excellent)	Represents the proportion of data points with small prediction errors; higher P-values indicate better model consistency.
	$0.80 \leq P < 0.95$ (Good)	
	$0.70 \leq P < 0.80$ (Acceptable)	
	$P < 0.70$ (Poor)	
Posterior Error Ratio (C)	$C \leq 0.35$ (Excellent)	Measures the variability of residuals relative to the original data; lower C-values indicate better model stability.
	$0.35 < C \leq 0.5$ (Good)	
	$0.5 < C \leq 0.65$ (Acceptable)	
	$C > 0.65$ (Poor)	

According to pilot policy documents (CLIP, 2023), eligibility for government subsidies is linked to individuals' enrolment in specific basic medical insurance schemes. For the population projection, model validation was conducted using GM (1,1) forecasts of insured populations at the municipal, provincial, and national levels, based on the most recent 5 to 10 years of available historical data. Model feasibility and accuracy were assessed through posterior error analysis, comparing the forecasted data with actual historical datasets. Three key evaluation metrics were employed: the small error probability (P), which measures the proportion of prediction errors within a specified threshold; the average relative error (C), which quantifies the average deviation between predicted and actual values; and the mean absolute percentage error (MAPE), a commonly used indicator of forecast accuracy.

Table 24, 25, and 26 summarise the model validation results for the municipal-, provincial-, and national-level subsidised population projection using the GM (1,1) grey forecasting model, including P, C, and MAPE. Model performance ratings are also provided based on the P and C values, alongside the computed

projective accuracy. Due to the variation in subsidy types specified in different pilot policies, insured individuals are eligible for different forms of fiscal subsidies depending on the basic insurance scheme in which they are enrolled. This is reflected in the naming of certain pilot regions, where suffixes appear after the city or province name (e.g., Jingmen-UEBMI, Sichuan-RBMI). The suffix ‘-UEBMI’ refers to individuals covered under the Urban Employee Basic Medical Insurance scheme (UEBMI), while ‘-RBMI’ denotes those enrolled in the Urban-Rural Resident Basic Medical Insurance scheme (RBMI). The term ‘retiree’ refers specifically to retired individuals within the UEBMI group. Additionally, the label ‘UEBMI-Employed in government and public institutions’ identifies UEBMI enrolees working in government or public-sector organisations.

Table 24 Model validation results for municipal-level subsidised population projection using GM (1,1): evaluation metrics and accuracy ratings

Pilot cities	Small Error Probability (P)	Posterior Error Ratio (C)	MAPE (%)	Model Rating (P)	Model Rating (C)	Accuracy (%)
Changchun	0.750	0.642	0.781	Acceptable	Acceptable	99.219
Nantong	1.000	0.127	0.379	Excellent	Excellent	99.621
Ningbo	1.000	0.402	1.389	Excellent	Good	98.611
Anqing	1.000	0.219	1.064	Excellent	Excellent	98.936
Shangrao	1.000	0.206	0.363	Excellent	Excellent	99.637
Qingdao	1.000	0.181	1.374	Excellent	Excellent	98.626
Hohhot	0.750	0.860	0.189	Acceptable	Poor	99.811
Kaifeng	1.000	0.172	0.710	Excellent	Excellent	99.290
Qianxinan	0.714	0.556	0.898	Acceptable	Acceptable	99.102
Hanzhong	0.571	0.770	0.958	Poor	Poor	99.042
Urumqi	0.833	0.623	0.513	Good	Acceptable	99.487
Jingmen-UEBMI	1.000	0.079	0.382	Excellent	Excellent	99.618
Jingmen-RBMI	1.000	0.080	0.141	Excellent	Excellent	99.859
Guangzhou	0.600	0.905	1.075	Poor	Poor	98.925
Overall prediction accuracy (%)				99.270		

Table 25 Model validation results for provincial-level subsidised population projection using GM (1,1): evaluation metrics and accuracy ratings

Pilot provinces	Small Error Probability (P)	Posterior Error Ratio (C)	MAPE (%)	Model Rating (P)	Model Rating (C)	Accuracy (%)
Jilin	1.000	0.202	1.044	Excellent	Excellent	98.956
Jiangsu	1.000	0.105	0.124	Excellent	Excellent	99.876
Zhejiang	1.000	0.219	0.798	Excellent	Excellent	99.202
Anhui	1.000	0.079	0.466	Excellent	Excellent	99.534
Jiangxi	1.000	0.095	0.208	Excellent	Excellent	99.792
Shangdong	1.000	0.069	0.251	Excellent	Excellent	99.749
Beijing	0.800	0.615	0.263	Good	Acceptable	99.737
Inner Mongolia	1.000	0.201	0.084	Excellent	Excellent	99.916
Henan	1.000	0.061	0.137	Excellent	Excellent	99.863
Guizhou	0.200	0.817	0.360	Poor	Poor	99.640
Shaanxi	0.800	0.656	3.341	Good	Poor	96.659
Xinjiang	1.000	0.294	0.158	Excellent	Excellent	99.842
Hubei	0.600	0.845	0.233	Poor	Poor	99.767
Shanxi	1.000	0.030	0.097	Excellent	Excellent	99.903
Yunnan	1.000	0.093	0.217	Excellent	Excellent	99.783
Sichuan-Retiree	1.000	0.328	1.016	Excellent	Excellent	98.984
Sichuan-RBMI	1.000	0.233	0.708	Excellent	Excellent	99.292
Gansu	1.000	0.003	0.005	Excellent	Excellent	99.995
Overall prediction accuracy (%)				99.472		

Table 26 Model validation results for national-level subsidised population projection using GM (1,1): evaluation metrics and accuracy ratings

Insured scheme	Small Error Probability (P)	Posterior Error Ratio (C)	MAPE (%)	Model Rating (P)	Model Rating (C)	Accuracy (%)
UEBMI	1.000	0.033	0.094	Excellent	Excellent	99.906
Retirees under UEBMI	1.000	0.021	0.078	Excellent	Excellent	99.922
RBMI	1.000	0.179	0.262	Excellent	Excellent	99.738
Children and students (incl. primary, secondary & university students)	1.000	0.088	0.103	Excellent	Excellent	99.897
UEBMI-Employed in the government and public institutions	1.000	0.153	0.239	Excellent	Excellent	99.761
Overall prediction accuracy (%)				99.845		

Among the 37 model validation results presented in Tables 24 to 26, the majority received ‘Excellent’ ratings for both the small error probability (P) and the posterior error ratio (C). Specifically, only four results were rated ‘Poor’ in both P and C, while one was rated ‘Poor’ and ‘Acceptable’ in P and C, two were rated ‘Acceptable’ in both metrics. Notably, however, all 37 cases reported an accuracy rate exceeding 95 per cent, indicating a consistently high level of forecast precision across the dataset.

Each region in our study was modelled independently, with separate data sources, projection, and validation procedures. Therefore, there is no aggregation across cities in the modelling process, and removing a subset of cities would not constitute a meaningful robustness check in the conventional sense. To examine whether alternative forecasting models could improve results, this study additionally tested ARIMA, exponential smoothing, and linear regression on the seven cases where GM (1,1) exhibited relatively weaker performance (please see Appendix 2). The results suggest that GM (1,1) still outperforms the alternatives in most situations, particularly when historical data are limited.

Therefore, the GM (1,1) model is considered sufficiently robust to be used for projecting insured population figures at the municipal, provincial, and national levels in the subsequent analysis. In addition, the overall prediction accuracy across the three tables exceeds 99 per cent, further confirming the model's validity for projecting purposes.

For the projection of GPBR, historical data revealed substantial anomalies across several pilot cities and provinces between 2020 and 2023, characterised by sharp increases or decreases. For example, based on data from local statistical bureaus, Changchun experienced a year-on-year increase of 45.21

per cent from 2020 to 2021, while Nantong recorded a year-on-year decrease of 13.68 per cent from 2021 to 2022. Since 2021, the emergence of more infectious COVID-19 variants such as Delta and Omicron led to the most significant outbreak in China and Hong Kong in over two years (Tan, 2022). Although the Chinese government officially maintained its zero-COVID policy during this period, the release of the *Notice on Further Optimising the Implementation of COVID-19 Prevention and Control Measures* by the State Council Joint Prevention and Control Mechanism in 2022 signalled a gradual relaxation of control measures (GOV, 2022).

Given that the years 2021 to 2023 represent a period of intensified pandemic response, this study limits the reference period for GPBR data to 2015-2024. For pilot regions without substantial anomalies, the most recent years of data were retained; for those with significant distortions (and given the post-pandemic recovery period in 2023-2024), abnormal values were either excluded or replaced with pre-pandemic data. Within this range, a five-year subset exhibiting a stable trend (after removing statistical outliers) is selected as the basis for projection. Subsequent forecasting of GPBR is again validated using posterior error analysis, applying the same three evaluation metrics (P, C, and MAPE) as used in the population projection (see Tables 27, 28, and 29).

Table 27 Model validation results for municipal-level GPBR projection using GM (1,1): evaluation metrics and accuracy ratings

Pilot cities	Small Error Probability (P)	Posterior Error Ratio (C)	MAPE (%)	Model Rating (P)	Model Rating (C)	Accuracy (%)
Changchun	1.00	0.06	0.32	Excellent	Excellent	99.68
Nantong	1.00	0.31	0.57	Excellent	Excellent	99.43
Ningbo	1.00	0.30	1.17	Excellent	Excellent	98.83
Anqing	1.00	0.14	1.28	Excellent	Excellent	98.72
Shangrao	1.00	0.10	0.50	Excellent	Excellent	99.50
Qingdao	0.60	0.80	1.75	Poor	Poor	98.25
Hohhot	1.00	0.29	1.21	Excellent	Excellent	98.79
Kaifeng	1.00	0.16	1.36	Excellent	Excellent	98.64
Qianxinan	1.00	0.03	0.04	Excellent	Excellent	99.96
Hanzhong	0.60	0.70	3.16	Poor	Poor	96.84
Urumqi	1.00	0.22	1.46	Excellent	Excellent	98.54
Jingmen	1.00	0.14	1.10	Excellent	Excellent	98.90
Guangzhou	1.00	0.29	0.85	Excellent	Excellent	99.15
Overall prediction accuracy (%)			98.86			

Table 28 Model validation results for provincial-level GPBR projection using GM (1,1): evaluation metrics and accuracy ratings

Pilot provinces	Small Error Probability (P)	Posterior Error Ratio (C)	MAPE (%)	Model Rating (P)	Model Rating (C)	Accuracy (%)
Jilin	0.60	1.07	2.27	Poor	Poor	97.73
Jiangsu	1.00	0.19	0.52	Excellent	Excellent	99.48
Zhejiang	1.00	0.41	0.92	Excellent	Good	99.08
Anhui	1.00	0.19	1.08	Excellent	Excellent	98.92
Jiangxi	1.00	0.17	0.90	Excellent	Excellent	99.10
Shangdong	0.80	0.49	1.76	Good	Good	98.24
Beijing	1.00	0.22	1.22	Excellent	Excellent	98.78
InnerMongolia	1.00	0.14	1.36	Excellent	Excellent	98.64
Henan	0.80	0.47	1.22	Good	Good	98.78
Guizhou	0.60	0.52	2.24	Poor	Acceptable	97.76
Shaanxi	1.00	0.27	3.38	Excellent	Excellent	96.62
Xinjiang	1.00	0.10	1.03	Excellent	Excellent	98.97
Hubei	1.00	0.15	0.43	Excellent	Excellent	99.57
Shanxi	1.00	0.34	4.06	Excellent	Excellent	95.94
Yunnan	1.00	0.20	0.79	Excellent	Excellent	99.21
Sichuan	1.00	0.21	1.53	Excellent	Excellent	98.47
Gansu	0.80	0.58	3.20	Good	Acceptable	96.80
Overall prediction accuracy (%)			98.36			

Table 29 Model validation results for national-level GPBR projection using GM (1,1): evaluation metrics and accuracy ratings

China mainland	Small Error Probability (P)	Posterior Error Ratio (C)	MAPE (%)	Model Rating (P)	Model Rating (C)	Accuracy (%)
GPBR	1.000	0.256	1.835	Excellent	Excellent	98.165
Overall prediction accuracy (%)			98.16			

When applied to the projection of GPBR, the GM (1,1) model demonstrated better performance in terms of the small error probability (P) and the posterior error ratio (C) compared to the subsidised population forecasts. Among the 31

model validation results presented in Tables 27 to 29, only three cases were rated 'Poor' in both P and C, and none were rated 'Acceptable' in both metrics. However, the model's performance in terms of accuracy was slightly lower than that observed in the subsidised population projections, with all 31 cases reporting accuracy rates exceeding 95 per cent, compared to the previous 37 cases, all of which exceeded the 98 per cent threshold. Despite this, the overall prediction accuracy in Table 27 to 29 is consistently above 98 per cent, which supports the model's applicability for forecasting GPBR in the subsequent analysis.

Similarly, for GPBR, each region was modelled independently using specific data. No aggregation was performed across cities, and model validation was conducted separately. To assess the robustness of GM (1,1) in this context, ARIMA, exponential smoothing, and linear regression (OLS) were also applied to a subset of regions where GM (1,1) showed relatively weaker performance (please see Appendix 3). The results remain consistent: GM (1,1) generally provided the most stable and accurate forecasts, especially in cases with limited historical data.

7.3 Results of Projection

7.3.1 Subsidised Population

Municipal Level

Prior to 2016, China’s basic medical insurance schemes were differentiated by urban and rural residency status. Urban residents were covered by the Urban Resident Basic Medical Insurance scheme, while rural residents were enrolled in the New Cooperative Medical Scheme (NCMS). In 2016, the State Council initiated the integration of these two systems into a unified Urban-Rural Resident Basic Medical Insurance (RBMI) scheme (GOV, 2016). Due to the transitional nature of this policy and the time required to consolidate and standardise population data, some municipal-level statistics on RBMI participants only became available starting in 2018 (e.g., Suzhou). In addition, the availability of 2024 data varies across cities. Some statistical bureaus have already released figures, while others have only published data up to 2022 or 2023 due to differences in data reporting timelines.

Table 30 presents historical data on the subsidised population under LTCI pilot policies across selected municipal-level cities from 2016 to 2024. Each city has implemented LTCI subsidies targeting specific eligible groups and the duration of subsidy, which are indicated directly below the city name. UEBMI refers to individuals enrolled in the Urban Employee Basic Medical Insurance scheme; RBMI denotes those covered under the Urban and Rural Resident Basic

Medical Insurance scheme; and BMI refers to the general population enrolled in either UEBMI or RBMI. Cells marked as NA indicate that, in the corresponding year, the city had either not yet implemented government subsidies for LTCI or had not released data for the specified insured group.

Table 30 Municipal-level subsidised population data under LTCI pilot policies (2016–2024)

Pilot cities	Changchun	Nantong		Suzhou		Ningbo	Anqing	Shangrao	
Eligibility	RBMI	RBMI	UEBMI	UEBMI	RBMI	RBMI	UEBMI	RBMI	UEBMI
Duration of subsidy	2021-now	2016-now	2016-2021	2017-2021	2017-2021	2022-now	2020-now	2019-now	2017-2019
2016	NA	NA	1879200	NA	NA	NA	NA	NA	NA
2017	NA	NA	1434400	6883100	NA	NA	NA	6611100	6883100
2018	NA	5068700	2106300	7375600	NA	NA	NA	6597400	7375600
2019	NA	4969000	2260900	7608900	NA	NA	NA	6546000	NA
2020	NA	4898600	2388300	7830300	2821046	NA	491210	6514700	NA
2021	6141283	4827100	2524000	8064500	2922518	NA	513363	6370000	NA
2022	6325500	4670000	NA	NA	NA	2962400	530800	6239200	NA
2023	6216900	4539000	NA	NA	NA	2866800	NA	6161000	NA
2024	NA	4447800	NA	NA	NA	2956000	NA	NA	NA
Pilot cities	Qingdao	Hohhot	Kaifeng	Qianxinan	Hanzhong	Urumqi	Chengde	Jingmen	Guangzhou
Eligibility	UEBMI	BMI	RBMI	RBMI	UEBMI	RBMI	UEBMI	UEBMI: 2016	RBMI
Duration of subsidy	2021-now	2020-now	2022-now	2022-now	2021-now	2021-now	2016-2020	BMI: 2017-now	2020-now
2016	NA	NA	NA	NA	NA	NA	436400	380307	NA
2017	NA	NA	NA	NA	NA	NA	437300	420000	NA
2018	NA	NA	NA	NA	NA	NA	458700	424300	NA
2019	NA	NA	NA	NA	NA	NA	468100	409081	NA
2020	NA	2340000	NA	NA	NA	NA	482100	2538111	5039403
2021	4225214	2351000	NA	NA	373100	1036900	NA	2528319	5023300
2022	4292156	2341000	4090000	3063100	374200	1027200	NA	2512800	4827267
2023	4462866	2357600	3784900	3013200	NA	1010800	NA	2479200	4884277
2024	4522300	NA	3653500	NA	NA	NA	NA	NA	4942800

Table 31 presents the completed data for 2016 to 2024, which were imputed using the GM (1,1) model, as well as projections for the subsidised population in 15 selected pilot cities from 2025 to 2035. The cities of Suzhou and Chengde are excluded from projections beyond 2021 and 2020, respectively, as local policy reforms enacted after those years removed government subsidies from the LTCI financing mechanisms.

Table 31 Projected municipal-level subsidised population (2016–2035)

Year	Changchun	Nantong	Suzhou	Ningbo	Anqing	Shangrao	Qingdao	Hohhot
2016	NA	1879200	NA	NA	436192	NA	3317018	NA
2017	NA	1434400	6883100	NA	443226	6883100	3474162	NA
2018	NA	7175000	7375600	3273900	449438	7375600	3666251	NA
2019	NA	7229900	7608900	3223000	454770	6546000	3886589	NA
2020	6425000	7286900	10651346	3160600	491210	6514700	4105885	2340000
2021	6141283	7351100	10987018	3156500	513363	6370000	4225214	2351000
2022	6325500	4670000	NA	2962400	530800	6239200	4292156	2341000
2023	6216900	4539000	NA	2866800	551200	6161000	4462866	2357600
2024	6303281	4447800	NA	2956000	573671	6087174	4522300	2356486
2025	6341364	4353785	NA	2819196	597059	5999920	4789566	2359804
2026	6379676	4254114	NA	2756057	621400	5913918	4967308	2363126
2027	6418220	4156726	NA	2694332	646733	5829147	5151647	2366454
2028	6456997	4061567	NA	2633990	673099	5745592	5342827	2369786
2029	6496008	3968586	NA	2574999	700541	5663235	5541101	2373122
2030	6535255	3877734	NA	2517329	729100	5582058	5746734	2376463
2031	6574739	3788962	NA	2460951	758824	5502045	5959998	2379810
2032	6614462	3702222	NA	2405835	789760	5423179	6181176	2383160
2033	6654425	3617468	NA	2351954	821957	5345443	6410562	2386516
2034	6694629	3534654	NA	2299279	855467	5268821	6648460	2389876
2035	6735075	3453736	NA	2247785	890343	5193298	6895188	2393241
Year	Kaifeng	Qianxinan	Hanzhong	Urumqi	Chengde	Jingmen	Guangzhou	
2016	NA	NA	378900	NA	436400	380307	NA	
2017	NA	2877400	381600	NA	437300	420000	NA	
2018	NA	2993300	387000	1025600	458700	424300	NA	
2019	NA	2943100	387700	1035300	468100	409081	NA	
2020	NA	3028100	371400	1044500	482100	2538111	5039403	
2021	4200000	3069100	373100	1036900	NA	2528319	5023300	
2022	4090000	3063100	374200	1027200	NA	2512800	4827267	
2023	3784900	3013200	369772	1010800	NA	2479200	4884277	
2024	3653500	3068445	367139	1011297	NA	2458280	4942800	
2025	3422694	3082950	364525	1004847	NA	2438709	4861555	
2026	3232379	3097523	361930	998439	NA	2422233	4836271	
2027	3052647	3112165	359353	992072	NA	2408922	4811118	
2028	2882909	3126877	356794	985745	NA	2398854	4786096	
2029	2722609	3141658	354254	979458	NA	2392115	4761204	
2030	2571222	3156509	351732	973212	NA	2388797	4736442	
2031	2428253	3171430	349227	967005	NA	2389002	4711808	
2032	2293233	3186422	346741	960838	NA	2392839	4687303	
2033	2165721	3201484	344272	954711	NA	2400427	4662925	
2034	2045299	3216618	341821	948622	NA	2411894	4638673	
2035	1931573	3231823	339387	942573	NA	2427376	4614548	

To more clearly illustrate the trends in subsidised population across pilot cities, this chapter presents line charts (Figures 14, 15, and 16), each displaying data for five cities. Among the 15 cities, seven exhibit an overall increasing trend in the number of subsidised individuals. Specifically, Chengde, Changchun, Hohhot, and Qianxinan demonstrate slow but steady growth, while Qingdao and Anqing show a more consistent and linear upward trajectory. Notably, Suzhou displays a stepwise growth pattern. This is primarily due to missing data

on RBMI enrolees from 2017 to 2019. Although Suzhou's LTCl policy provides subsidies to all individuals covered by the basic medical insurance system, only UEBMI data are available for the years prior to 2020. As a result, the first inflection point appears in 2019, when the data for UEBMI enrolees show a significant increase. The second inflection point occurs later, as both UEBMI and RBMI populations continue to grow, resulting in a marked rise in the total subsidised population.

In contrast, six cities exhibit a declining trend in the number of subsidised individuals. Among them, Shangrao and Ningbo show a consistent linear decline, while Hanzhong and Guangzhou experience only a slight downward trend over the projection period. Notably, Kaifeng displays a substantial decrease in its subsidised population throughout the 2016–2035 period, indicating a sharp and sustained downward trajectory.

The trends in Nantong and Jingmen are more complex and do not follow a simple upward or downward trajectory. In Nantong, the first inflection point occurred in 2017, driven by two key factors. First, due to the absence of RBMI enrolment data for 2016-2017 and a concurrent decline in UEBMI enrolment during this period, the overall trend before 2017 appears to be decreasing. The sharp increase observed between 2017 and 2018 is primarily a data artefact resulting from the sudden availability of RBMI figures, rather than a substantive

change in LTCI policy. The second inflection point appears in 2021, when Nantong implemented a new LTCI expansion policy that removed fiscal subsidies for UEBMI enrollees. This policy change led to a sharp decline between 2021 and 2022. From 2022 onwards, LTCI subsidies in Nantong have been limited to RBMI participants. As the local RBMI enrolment figures have shown a gradual decline, the projected trend in the subsidised population similarly reflects a slow downward trajectory.

Similarly, the first inflection point observed in Jingmen is also attributable to data limitations. During the initial phase of the LTCI pilot, the local government subsidised only UEBMI enrollees in 2016. From 2017 onwards, RBMI enrollees were formally included in the subsidy policy. However, due to the unavailability of RBMI enrolment data, the recorded subsidised population between 2017 and 2019 only reflects UEBMI enrollees. Beginning in 2020, the release of RBMI data resulted in a sharp increase in the total subsidised population. The change driven by data availability rather than a policy shift and thus considered a data artefact. Following 2020, the trend in Jingmen's subsidised population exhibits a mild decline from 2020 to 2032, followed by a slight rebound between 2032 and 2035. However, the overall magnitude of fluctuation is minimal, resulting in only a subtle visual change in the line chart. This pattern primarily reflects divergent trends between the UEBMI and RBMI insured populations. While UEBMI enrolment has shown a steady increase since 2016, RBMI enrolment

has declined continuously since 2020. As the LTCI policy in Jingmen includes both groups as eligible for subsidies, the opposing trends effectively offset one another, resulting in a slight decline followed by a marginal increase in the total subsidised population.

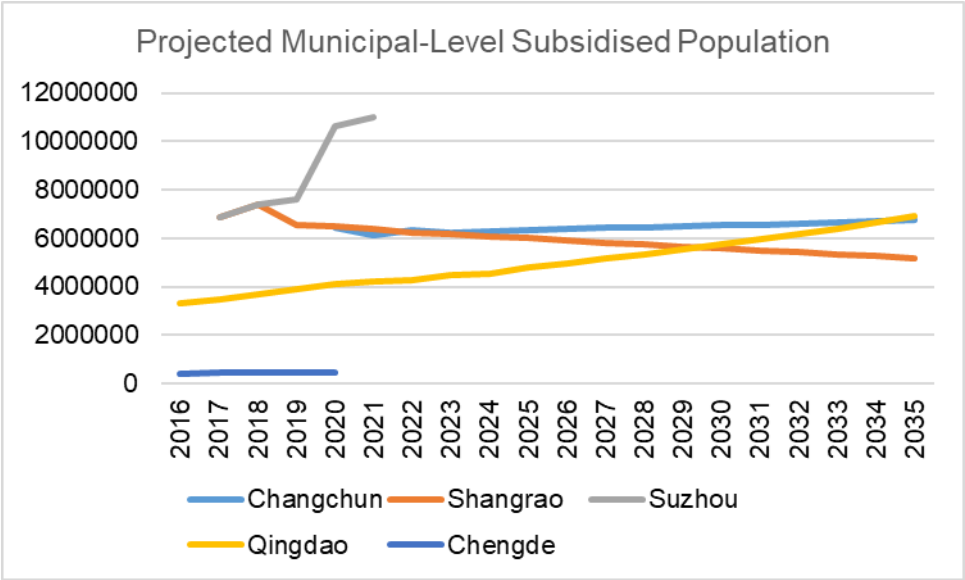


Figure 14 Projected municipal-level subsidised population (2016–2035)

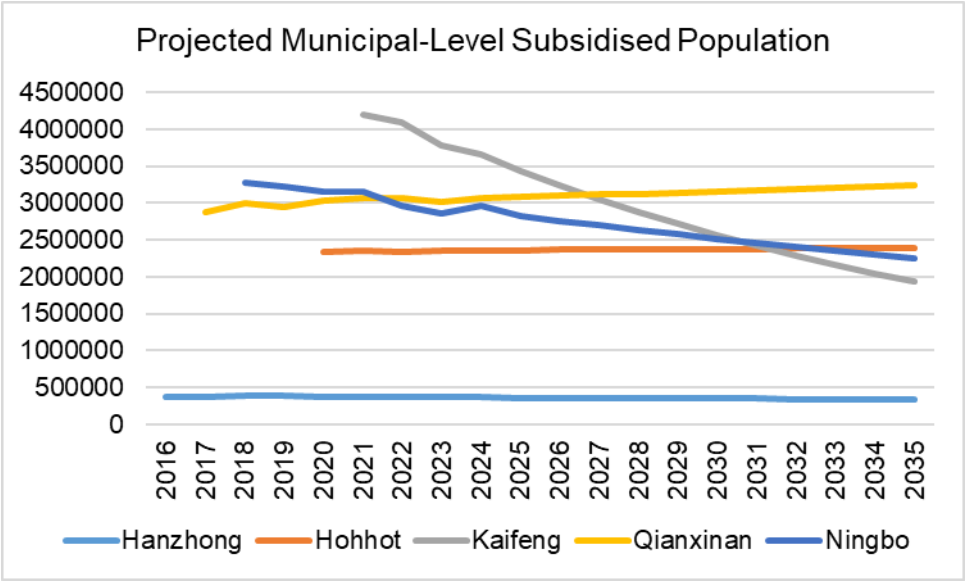


Figure 15 Projected municipal-level subsidised population (2016–2035)

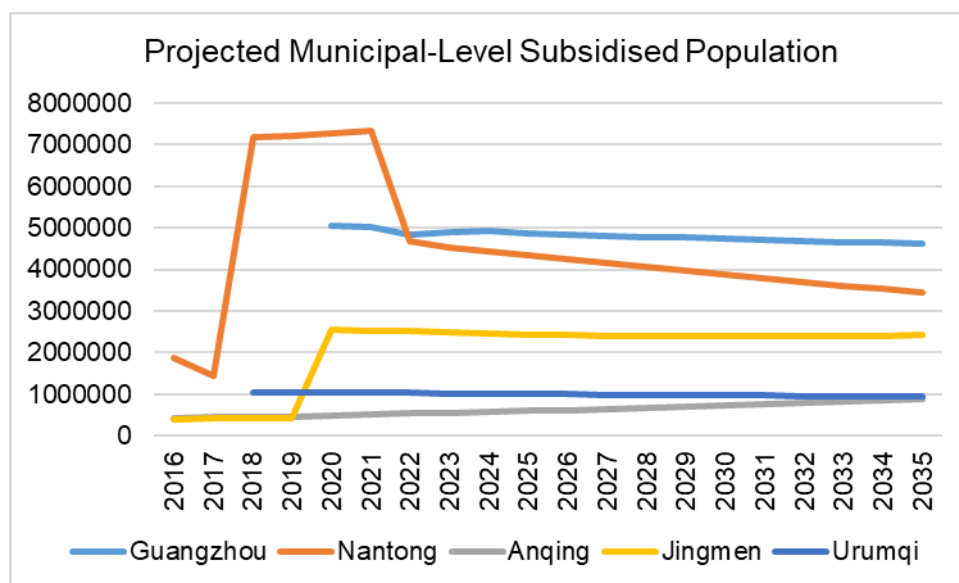


Figure 16 Projected municipal-level subsidised population (2016–2035)

Provincial Level

This section builds upon the previous municipal-level analysis by applying the GM (1,1) model to provincial-level population data corresponding to the provinces in which the pilot cities are located. The objective is to evaluate whether the LTCI subsidy policies implemented in the selected 15 pilot cities would remain financially sustainable if scaled up to the provincial level over the next decade (2025–2035).

In total, 17 pilot provinces are included in this analysis, selected based on the following criteria:

1. Exclusion of provinces where LTCI subsidies were withdrawn following the launch of the second-phase pilot expansion in 2020. For example, Hebei Province is excluded, as Chengde terminated its LTCI fiscal subsidies after

2021.

2. Exclusion of Guangdong Province, where LTCI subsidies in Guangzhou are calculated based on the local RBMI contribution base. Since each of Guangdong's 122 counties and districts has a different RBMI contribution base, applying a single provincial average would oversimplify local variation and undermine the credibility of projected subsidy estimates.
3. Inclusion of Beijing Municipality, despite the pilot being conducted only in Shijingshan District. Due to data unavailability, Shijingshan was excluded from the municipal-level analysis, but the full city was included at the provincial level using aggregate city-wide data.
4. Due to the shift to provincial-level pension pooling, consistent municipal pension data are unavailable for several cities (Fang, 2024). Consequently, Kunming, Chengdu, and Jincheng were excluded from the municipal-level forecasting but included in the provincial-level analysis.

Table 32 includes annotations beneath each province name indicating the categories of insured individuals eligible for LTCI fiscal subsidies. In three provinces, UEBMI enrollees are not universally subsidised; instead, only retirees within the UEBMI group are eligible. Sichuan Province is a special case, as it contains two subcategories (retirees under UEBMI and RBMI) reflecting its mixed subsidy type. Specifically, the pilot city Chengdu in Sichuan Province provides proportional subsidies for UEBMI retirees and fixed-sum subsidies for

RBMI enrolees. Another notable exception is Gansu Province, where the pilot was conducted in the Gannan Tibetan Autonomous Prefecture. In this case, eligibility for fiscal subsidies is determined by employment sector. Only UEBMI enrolees employed in government departments or public institutions are covered.

Table 32 Projected provincial-level subsidised population (2025–2035)

Pilot provinces	Jilin	Jiangsu	Zhejiang	Anhui	Jiangxi	Shangdong	Beijing	Inner Mongolia	Henan
Eligibility	RBMI	RBMI	RBMI	UEBMI	RBMI	UEBMI	RBMI	BMI	RBMI
2025	15399907	45241708	24502457	12233947	37364100	27881247	4036385	21238322	80365215
2026	14875295	44570870	23543098	12848464	36551824	28870123	4039754	21075149	78187451
2027	14368555	43909980	22621302	13493849	35757207	29894072	4043127	20913229	76068701
2028	13879078	43258889	21735597	14171651	34979865	30954338	4046502	20752554	74007365
2029	13406275	42617452	20884570	14883500	34219422	32052208	4049880	20593112	72001888
2030	12949579	41985526	20066864	15631106	33475510	33189017	4053261	20434896	70050756
2031	12508440	41362970	19281175	16416264	32747771	34366146	4056644	20277895	68152497
2032	12082329	40749646	18526248	17240861	32035852	35585025	4060031	20122101	66305677
2033	11670734	40145416	17800879	18106878	31339410	36847134	4063420	19967504	64508904
2034	11273160	39550145	17103911	19016395	30658108	38154007	4066812	19814094	62760819
2035	10889130	38963701	16434231	19971598	29991617	39507231	4070207	19661863	61060105
Pilot provinces	Guizhou	Shaanxi	Xinjiang	Gansu	Hubei	Shanxi	Yunnan	Sichuan	
Eligibility	RBMI	UEBMI	RBMI	UEBMI-Employed in government and public institutions	BMI	Retiree under UEBMI	Retiree under UEBMI	Retiree under UEBMI	RBMI
2025	36676055	9111030	16349834	1664258	55616209	2620607	1802294	5896136	58285954
2026	36543553	9581375	16248026	1714994	55535173	2694997	1851842	6084687	56560486
2027	36411529	10076002	16146851	1767276	55454255	2771499	1902751	6279267	54886099
2028	36279983	10596163	16046306	1821153	55373456	2850172	1955060	6480070	53261278
2029	36148912	11143177	15946388	1876671	55292773	2931078	2008808	6687295	51684559
2030	36018314	11718429	15847091	1933883	55212209	3014281	2064032	6901146	50154515
2031	35888188	12323378	15748413	1992838	55131762	3099846	2120775	7121836	48669766
2032	35758532	12959557	15650350	2053591	55051432	3187840	2179078	7349584	47228971
2033	35629345	13628578	15552897	2116195	54971219	3278331	2238984	7584614	45830829
2034	35500624	14332137	15456051	2180709	54891123	3371392	2300537	7827161	44474076
2035	35372368	15072015	15359808	2247188	54811144	3467094	2363782	8077463	43157489

To more clearly compare enrolment levels and trends, this section groups the 17 pilot provinces by similar population change patterns and presents the results in clustered bar charts (Figures 17 to 19). As Sichuan Province adopts a mixed subsidy model, its two eligible groups (UEBMI retirees and RBMI enrolees) were projected separately. Accordingly, Sichuan is presented in a standalone chart (Figure 20).

In terms of the number of LTCI subsidised population, Henan Province, although it provides subsidies only to RBMI enrollees, has the highest projected population, peaking at over 80 million. This figure significantly exceeds those of Inner Mongolia and Hubei, which subsidise both RBMI and UEBMI enrollees. In contrast, provinces that subsidise UEBMI enrollees, such as Shaanxi, Shandong, and Anhui, display comparatively smaller subsidised populations.

Provinces that provide subsidies only to a specific subgroup within the basic medical insurance population tend to have the smallest number of subsidised individuals. For instance, Shanxi has approximately 2.6 to 3.4 million subsidised individuals, Sichuan 5 to 8 million, Yunnan around 1.8 to 2.3 million, and Gansu approximately 1.6 to 2.4 million. In addition to LTCI subsidy eligibility criteria, the total number of subsidised individuals is also influenced by overall provincial population size. For example, Henan, which has the highest subsidised population, ranks third in total population among China's 31 provincial-level administrative regions according to the Seventh National Census. In contrast, provinces with 10 to 20 million subsidised individuals, such as Jilin and Inner Mongolia, are among the ten least populous regions in the country.

In terms of projected trends, among the nine pilot provinces showing a declining number of subsidised individuals between 2025 and 2035, five exhibit a clear

and steady downward trajectory: Henan, Jilin, Jiangsu, Zhejiang, and Jiangxi Province. In contrast, Inner Mongolia, Guizhou, Xinjiang, and Hubei also show decreasing trends, but at a more gradual pace. As noted earlier, Jingmen City displayed a fluctuating trend due to opposing movements in UEBMI and RBMI enrolment. However, at the provincial level, Hubei shows a consistently decreasing trend with no such fluctuations. Among the seven provinces with increasing subsidised populations, the most notable upward trends are observed in Anhui and Shandong, followed by Shaanxi. Gansu, Shanxi, Yunnan, and Beijing also show growth, but at a more moderate rate.

A comparison between municipal- and provincial-level projections reveals that most pilot cities follow a similar trend to their respective provinces. Exceptions include Inner Mongolia, Guizhou, and Shaanxi, where the trends observed at the provincial level differ from those of their pilot cities: Hohhot, Qianxinan, and Hanzhong, respectively.

Although Sichuan Province was plotted separately due to its mixed subsidy model, the overall trend remains consistently downward. The two subsidised groups in Sichuan exhibit opposing trends: the number of UEBMI retirees is increasing, while the RBMI enrolment is declining. However, because the RBMI population is significantly larger than the UEBMI retiree population, the declining trend in RBMI dominates. As a result, unlike Jingmen City, no

offsetting effect is observed, and the overall subsidised population follows a monotonic decreasing trajectory.

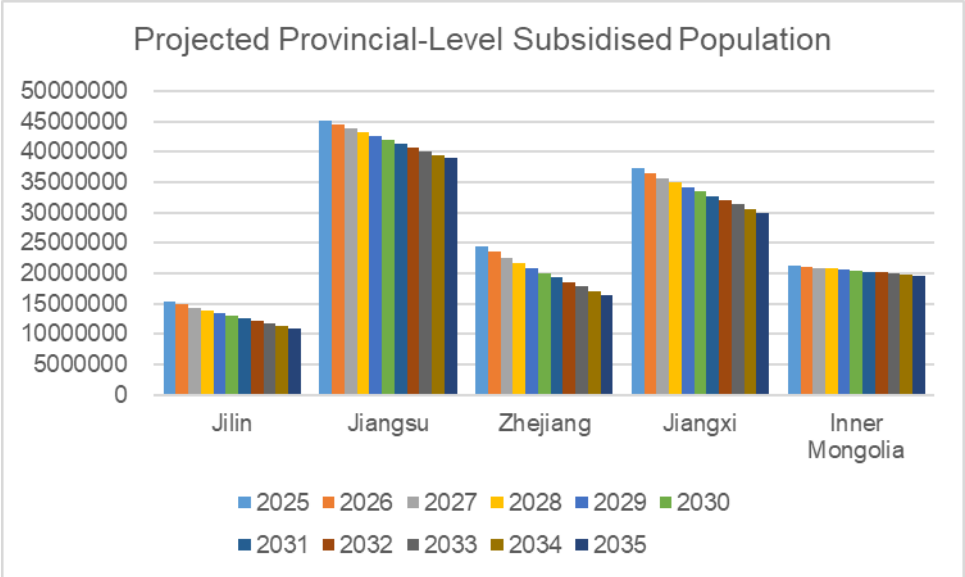


Figure 17 Projected provincial-level subsidised population (2025–2035)

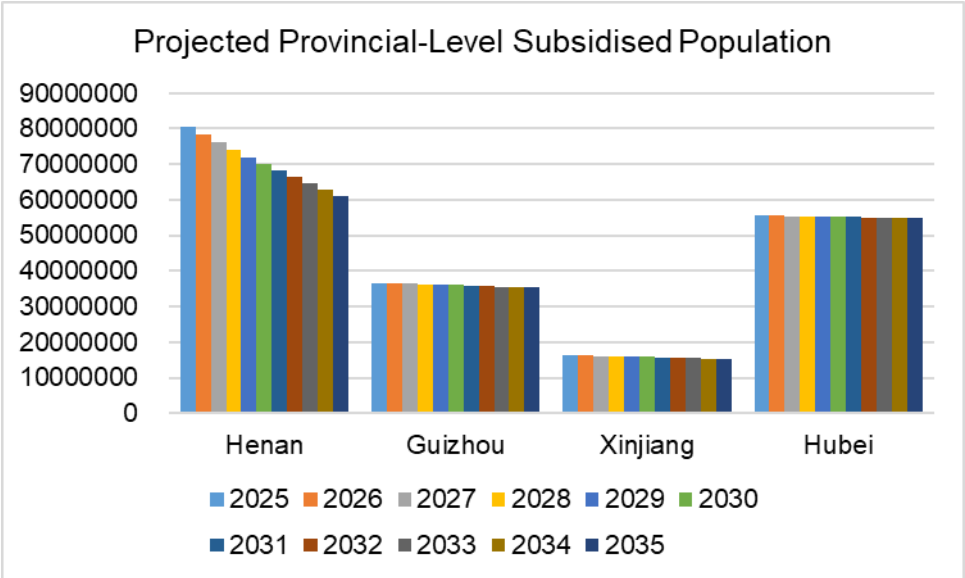


Figure 18 Projected provincial-level subsidised population (2025–2035)

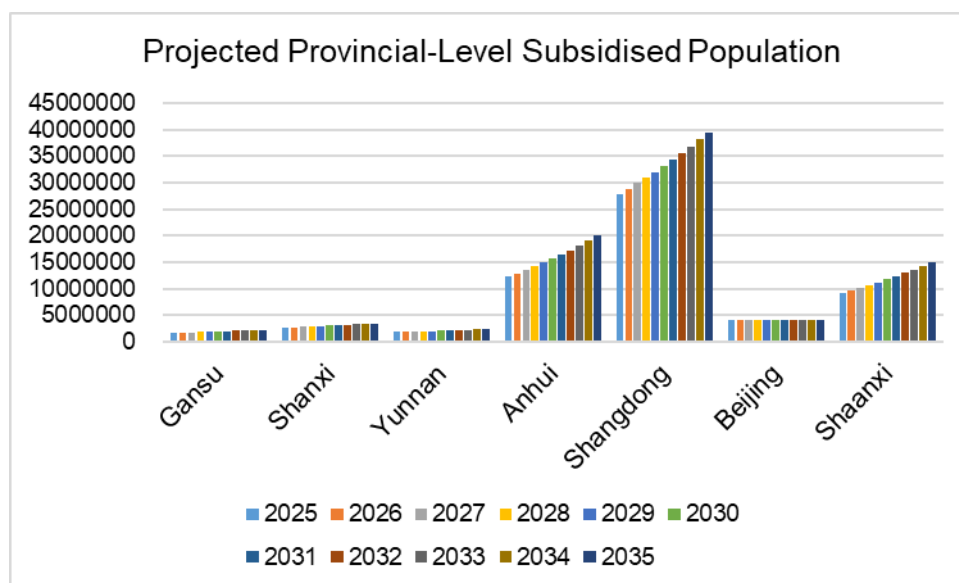


Figure 19 Projected provincial-level subsidised population (2025–2035)

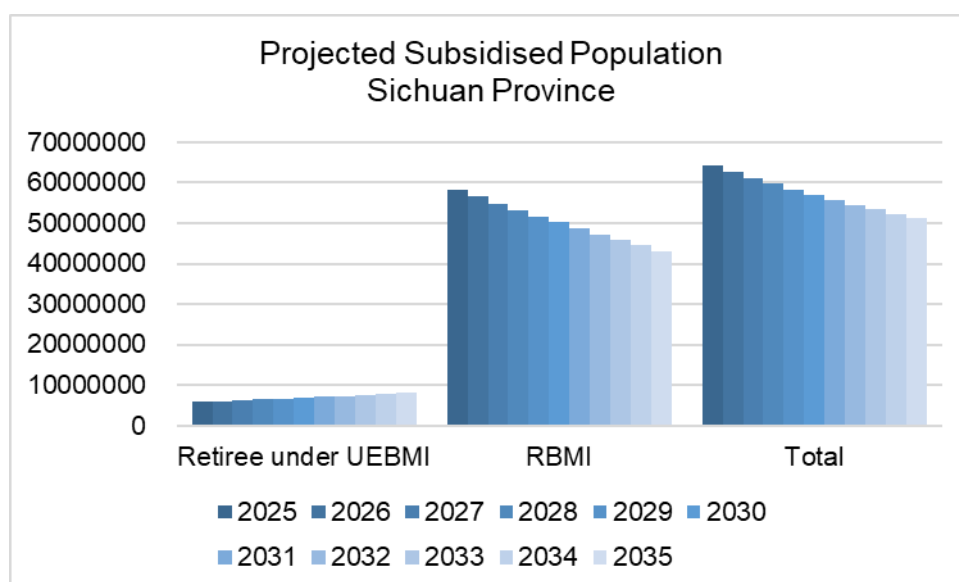


Figure 20 Projected subsidised population of Sichuan province (2025–2035)

National Level

The national-level projection of subsidised populations, along with the subsequent fiscal subsidy simulations, aims to assess which of the 17 LTCI subsidy designs (defined by eligibility criteria, subsidy amounts, and subsidy types) would demonstrate greater fiscal sustainability if implemented across

mainland China. This section specifically evaluates which subsidy models impose relatively lower fiscal pressure and can therefore be considered more viable for nationwide adoption.

To facilitate this analysis, the 17 subsidy eligibility schemes discussed in the previous sections are categorised into five distinct groups based on the target population: (1) All UEBMI enrolees; (2) Retirees under UEBMI; (3) UEBMI enrolees employed in government departments and public institutions; (4) All RBMI enrolees; and (5) Children and students enrolled in RBMI (including primary, secondary, and university students). Projections of the national subsidised population under each of these five eligibility scenarios for the period 2025–2035 are presented in Table 33, based on projections using the GM (1,1) model.

Figure 21 illustrates the projected trends for the five categories of subsidised populations at the national level. Unlike the municipal-level data, which often exhibit significant fluctuations, the national-level trends are remarkably stable. Consequently, the GM (1,1) model produces smooth and consistent forecasts over the 2025–2035 period. Among the five groups, UEBMI enrolees, retirees under UEBMI, and UEBMI enrolees working in government and public institutions all show increasing trends. In contrast, RBMI enrolees and children and students (including primary, secondary, and university students)

demonstrate a gradual decline. Interestingly, the diverging trends of retirees under UEBMI and children and students reflect broader demographic shifts currently taking place in China, namely population ageing and declining birth rates.

Table 33 Projected national-level subsidised population (2025–2035)

Year	UEBMI	Retirees under UEBMI	RBMI	Children and students (incl. primary, secondary & university students)	UEBMI-Government and Public Institutions
2025	389772683	106872757	929672697	257735579	68544687
2026	399387039	110568380	912406709	255935210	69471650
2027	409238547	114391798	895461387	254147418	70411149
2028	419333058	118347427	878830776	252372114	71363353
2029	429676567	122439841	862509030	250609211	72328435
2030	440275214	126673769	846490414	248858622	73306567
2031	451135293	131054105	830769297	247120262	74297928
2032	462263254	135585911	815340154	245394045	75302695
2033	473665703	140274426	800197563	243679886	76321050
2034	485349411	145125068	785336203	241977701	77353177
2035	497321316	150143444	770750849	240287407	78399262

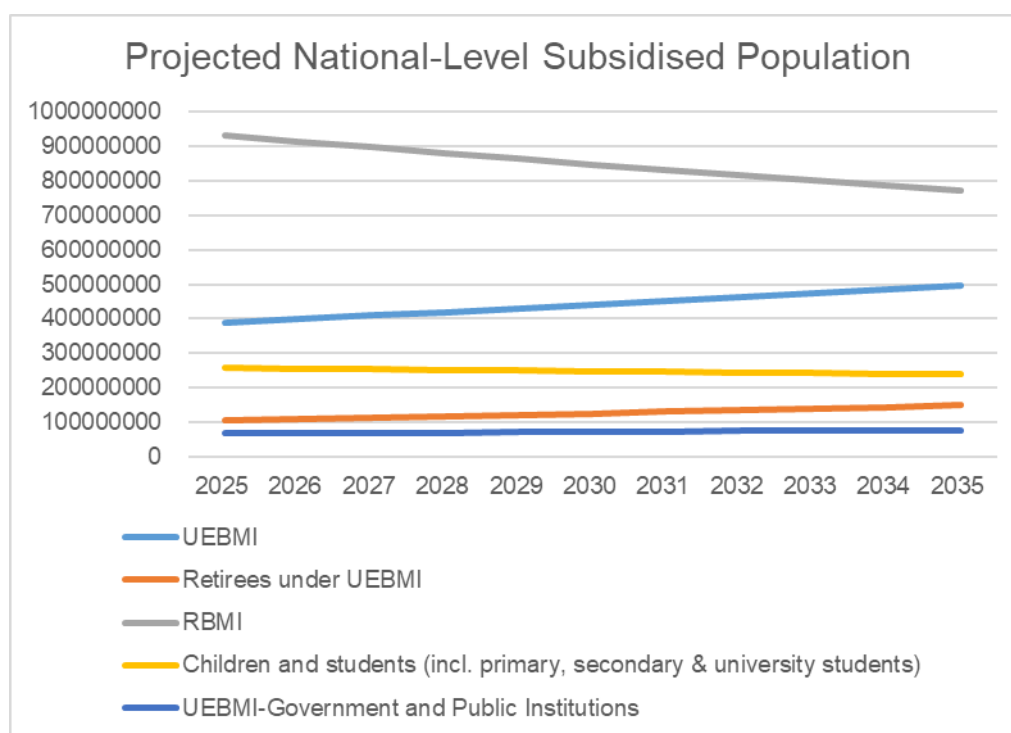


Figure 21 Projected national-level subsidised population (2025–2035)

The next section, Section 7.3.2 will build upon the previously projected subsidised populations to estimate the fiscal subsidies of LTCI financing stage from 2025 to 2035. Using the GM (1,1) model, the projections are based on the subsidy types, rates, and amounts specified in official LTCI policy documents issued by the pilot cities.

As with the population forecasts, the fiscal projections are structured into three levels: municipal, provincial, and national. The municipal-level analysis includes both the initial phase of pilot implementation and the subsequent expansion phase, with calculations reflecting the subsidy policies in effect during each period. Given the absence of publicly available official data on the fiscal contribution of government subsidies within China's LTCI financing mechanism, the estimates in Section 7.3.2 will be derived from historical population data in conjunction with detailed policy provisions.

7.3.2 LTCI Fiscal Subsidies in the Financing Stage

Municipal Level

Table 34 presents estimated annual fiscal subsidy expenditures for pilot cities that adopted fixed-sum subsidies, based on historical data from 2016 to 2024. The numerical values beneath each city name indicate the fixed subsidy amount stipulated in local LTCI policy documents. That is, the amount provided by local governments per eligible enrollee per year. These subsidies are not

distributed directly to individuals; rather, the total amount is calculated based on the number of subsidised individuals and disbursed by the government to the LTCI fund. As shown in Table 34, a total of 12 local governments adopted a fixed-sum subsidy type, though the subsidy amounts vary considerably, ranging from RMB 1.4 to RMB 60 per person per year. Notably, Shangrao adjusted its subsidy amount during the pilot period, initially setting it at RMB 30 per person per year in 2017 and 2018, before reducing it to RMB 5 from 2019 onwards. The direction of change in subsidy amounts generally aligns with trends in the subsidised population. Between 2016 and 2024, the lowest recorded annual fiscal subsidy was in Anqing in 2016 (RMB 2,180,960.00), while the highest was in Suzhou in 2021 (RMB 549,350,900.00).

Table 34 Municipal-level annual fixed-sum LTCI subsidies (2016–2024)

Year	Changchun	Nantong	Suzhou	Ningbo	Anqing	Shangrao
Subsidies (RMB/person/year)	2	40	50	60	5	After2017:30 After2019:5
2016	NA	75168000.00	NA	NA	2180960.00	NA
2017	NA	57376000.00	344155000.00	NA	2216130.00	206493000.00
2018	NA	287000000.00	368780000.00	196434000.00	2247190.00	221268000.00
2019	NA	289196000.00	380445000.00	193380000.00	2273850.00	32730000.00
2020	12850000.00	291476000.00	532567300.00	189636000.00	2456050.00	32573500.00
2021	12282566.00	294044000.00	549350900.00	189390000.00	2566815.00	31850000.00
2022	12651000.00	186800000.00	NA	177744000.00	2654000.00	31196000.00
2023	12433800.00	181560000.00	NA	172008000.00	2756000.00	30805000.00
2024	12606562.00	177912000.00	NA	177360000.00	2868355.00	30435870.00
Year	Qingdao	Hohhot	Kaifeng	Qianxinan	Hanzhong	Urumqi
Subsidies (RMB/person/year)	30	10	10	1.4	20	20
2016	NA	NA	NA	NA	NA	NA
2017	NA	NA	NA	NA	NA	NA
2018	NA	NA	NA	NA	NA	NA
2019	NA	NA	NA	NA	NA	NA
2020	NA	23400000.00	NA	NA	NA	NA
2021	126756420.00	23510000.00	NA	NA	7462000.00	20738000.00
2022	128764680.00	23410000.00	40900000.00	4288340.00	7484000.00	20544000.00
2023	133885980.00	23576000.00	37849000.00	4218480.00	7395440.00	20216000.00
2024	135669000.00	23564860.00	36535000.00	4295823.00	7342780.00	20225940.00

Note: The row labelled ‘Subsidies’ refers to the fixed subsidy amount granted per person per year, as specified in each city’s LTCI policy. The remaining values represent the total annual fiscal subsidy expenditure by city, expressed in RMB. NA = No subsidy was provided in that

year.

Table 35 presents the only three municipal-level LTCI pilot cities (Chengde, Jingmen, and Guangzhou) that adopted proportional subsidy models among the 15 cities selected for analysis. The formulas shown beneath each city name indicate the specific methods used to calculate the subsidy proportion. Guangzhou offers two tiers of subsidy rates (0.03 per cent and 0.12 per cent). For the purpose of this analysis, the higher-tier rate of 0.12 per cent is used to estimate the maximum potential fiscal subsidy expenditure. Compared with the fixed-sum subsidy models discussed earlier, the annual expenditures under proportional subsidy schemes are substantially higher, ranging from RMB 11,686,623.85 to RMB 315,730,781.17. Among the three cities, Guangzhou records the highest level of fiscal subsidy, followed by Jingmen, with Chengde exhibiting the lowest.

Table 35 Municipal-level annual proportional LTCI subsidies (2016–2024)

Year	Chengde 0.05% of prior year's gross wage × subsidised population	Jingmen 0.4% × previous year's per capita disposable income × 37.5% × subsidised population	Guangzhou 0.12% × RBMI annual contribution base per resident × subsidised population
2016	NA	11728097.42	NA
2017	11686623.85	14049049.68	NA
2018	13822924.50	15394837.25	NA
2019	15343849.90	16099626.15	NA
2020	16720433.25	108348151.42	260039242.08
2021	NA	117070419.71	273413489.88
2022	NA	126205314.28	277142521.79
2023	NA	135062783.18	295782960.08
2024	NA	145264633.15	315730781.17

Note: The row labelled 'Subsidies' indicates the proportional annual subsidy amount specified in each city's LTCI policy, expressed in RMB. NA = No subsidy was provided for that year.

Table 36 presents projected LTCI fiscal subsidies from 2025 to 2035 for 13 pilot cities, covering both fixed-sum and proportional subsidy types. The type of subsidy applied in each city is indicated beneath the city name. For cities with fixed-sum subsidies, the projected fiscal subsidy over the next decade is calculated by multiplying the fixed amount stipulated in the local LTCI policy document by the projected subsidised population, as projected in Section 7.3.1. For cities adopting proportional subsidy models, the projected subsidy is estimated using a baseline year and applying the compound annual growth rate (CAGR) derived from historical economic indicators published by local statistical bureaus. A cell-based aggregate projections model is then used to forecast annual subsidy expenditures from 2025 to 2035.

In the case of Jingmen, fiscal subsidies began in 2016, which is selected as the baseline year. In that year, the per capita subsidy was RMB 30.84. Using the per capita disposable income data for the period 2015-2019, the CAGR is calculated to be 0.847. This growth rate is applied in the cell-based aggregate projections model to generate annual fiscal subsidy projections for 2025–2035. Similarly, Guangzhou uses 2020 as the baseline year, with a per capita annual subsidy of RMB 51.6. The CAGR based on the city's GDP data from 2020 to 2024 is calculated to be 0.0548, which is then used in the cell-based aggregate projections model to forecast Guangzhou's annual fiscal subsidies for the same projection period.

Table 36 Municipal-level annual LTCI subsidies (2025–2035) - unit: RMB/year

Year	Changchun	Anqing	Hohhot	Qianxinan	Hanzhong	Urumqi	
Subsidy type	Fixed-sum	Fixed-sum	Fixed-sum	Fixed-sum	Fixed-sum	Fixed-sum	
2025	12682728.00	2985295.00	23598040.00	4316130.00	7290500.00	20096940.00	
2026	12759352.00	3107000.00	23631260.00	4336532.20	7238600.00	19968780.00	
2027	12836440.00	3233665.00	23664540.00	4357031.00	7187060.00	19841440.00	
2028	12913994.00	3365495.00	23697860.00	4377627.80	7135880.00	19714900.00	
2029	12992016.00	3502705.00	23731220.00	4398321.20	7085080.00	19589160.00	
2030	13070510.00	3645500.00	23764630.00	4419112.60	7034640.00	19464240.00	
2031	13149478.00	3794120.00	23798100.00	4440002.00	6984540.00	19340100.00	
2032	13228924.00	3948800.00	23831600.00	4460990.80	6934820.00	19216760.00	
2033	13308850.00	4109785.00	23865160.00	4482077.60	6885440.00	19094220.00	
2034	13389258.00	4277335.00	23898760.00	4503265.20	6836420.00	18972440.00	
2035	13470150.00	4451715.00	23932410.00	4524552.20	6787740.00	18851460.00	
Year	Nantong	Ningbo	Shangrao	Qingdao	Kaifeng	Jingmen	Guangzhou
Subsidy type	Fixed-sum	Fixed-sum	Fixed-sum	Fixed-sum	Fixed-sum	Proportional	Proportional
2025	174151400.00	169151760.00	29999600.00	143686980.00	34226940.00	156312222.17	327559433.01
2026	170164560.00	165363420.00	29569590.00	149019240.00	32323790.00	168404342.07	343713473.72
2027	166269040.00	161659920.00	29145735.00	154549410.00	30526470.00	181662178.77	360664135.74
2028	162462680.00	158039400.00	28727960.00	160284810.00	28829090.00	196223044.41	378450755.31
2029	158743440.00	154499940.00	28316175.00	166233030.00	27226090.00	212242650.06	397114533.75
2030	155109360.00	151039740.00	27910290.00	172402020.00	25712220.00	229897507.35	416698787.49
2031	151558480.00	147657060.00	27510225.00	178799940.00	24282530.00	249388224.40	437248793.31
2032	148088880.00	144350100.00	27115895.00	185435280.00	22932330.00	270942616.56	458812333.69
2033	144698720.00	141117240.00	26727215.00	192316860.00	21657210.00	294819874.80	481439264.54
2034	141386160.00	137956740.00	26344105.00	199453800.00	20452990.00	321314913.82	505181986.44
2035	138149440.00	134867100.00	25966490.00	206855640.00	19315730.00	350763288.13	530095706.85

To facilitate visual comparison, the 13 projected municipal-level LTCI subsidy results are divided into two groups based on total projected annual fiscal expenditure. Cities with projected subsidies below RMB 100 million for the period 2025–2035 are grouped in Figure 22 (8 cities), while those exceeding RMB 100 million are presented in Figure 23 (5 cities). As shown in Figure 22, the trends are evenly split between increasing and decreasing. Changchun, Anqing, Hohhot, and Qianxinan exhibit a monotonic upward trend, whereas Hanzhong, Urumqi, Shangrao, and Kaifeng show a consistent downward trend. Since all eight cities employ fixed-sum subsidy models, their fiscal subsidy trajectories closely mirror the projected trends in subsidised population discussed earlier. Kaifeng shows the largest decline, corresponding to the

sharpest drop in the eligible population.

Although Anqing and Qianxinan differ substantially in projected subsidised population (890,343 in Anqing vs. 3,232,823 in Qianxinan by 2035), their total projected LTCI subsidy amounts over the forecast period are similar. This convergence is primarily due to the difference in per capita subsidy rates: RMB 5 per person per year in Anqing and RMB 1.4 in Qianxinan. As a result, their projected expenditures begin to converge by 2034-2035. A similar pattern is also observed in Nantong and Ningbo (see Figure 23).

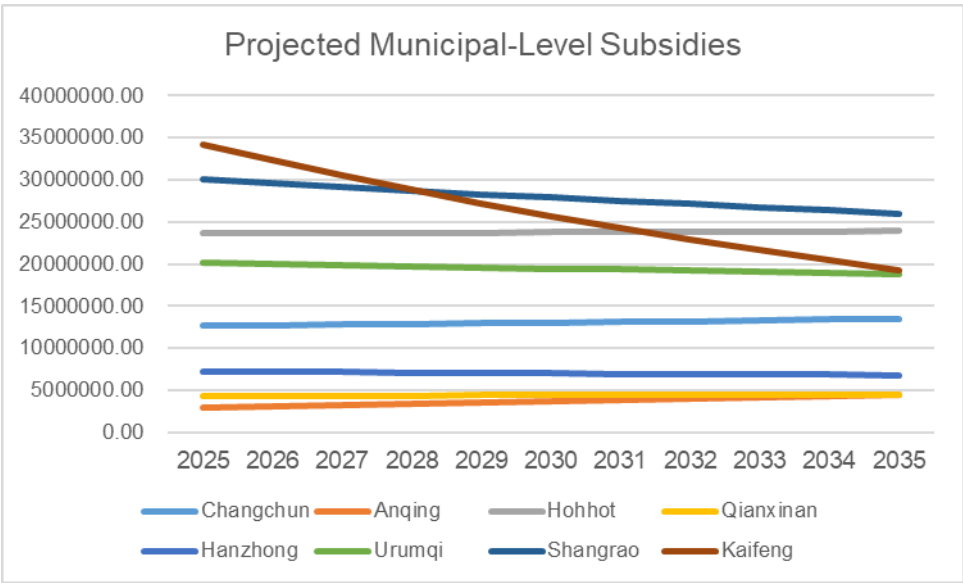


Figure 22 Projected municipal-level LTCI subsidies (2025–2035), below RMB 100 million

As shown in Figure 23, the two cities (Jingmen and Guangzhou) adopting proportional subsidy types exhibit the fastest growth in projected LTCI fiscal subsidy amounts. In Jingmen, annual subsidies increase from RMB

156,312,222.17 in 2025 to RMB 350,763,288.13 in 2035, representing a 2.2-fold growth. However, as discussed in Section 7.3.1, the projected subsidised population in Jingmen remains relatively stable, showing a mild decline followed by a slight rebound, with no major fluctuation over the forecast period. Similarly, Guangzhou's projected annual fiscal subsidy rises from RMB 327,559,433.01 in 2025 to RMB 530,095,706.85 in 2035, an increase of approximately 1.6 times. In contrast, the projected number of subsidised individuals in Guangzhou shows a downward trend.

This divergence between population trends and fiscal growth can be explained by the nature of the proportional subsidy mechanism. In both cities, the subsidy base is tied to economic indicators that have demonstrated steady growth in recent years, namely, per capita disposable income in Jingmen and the RBMI contribution base in Guangzhou. Historical data from local statistical bureaus confirm that both indicators have followed consistent upward trajectories, suggesting that continued economic growth is the primary driver of rising fiscal subsidy amounts.

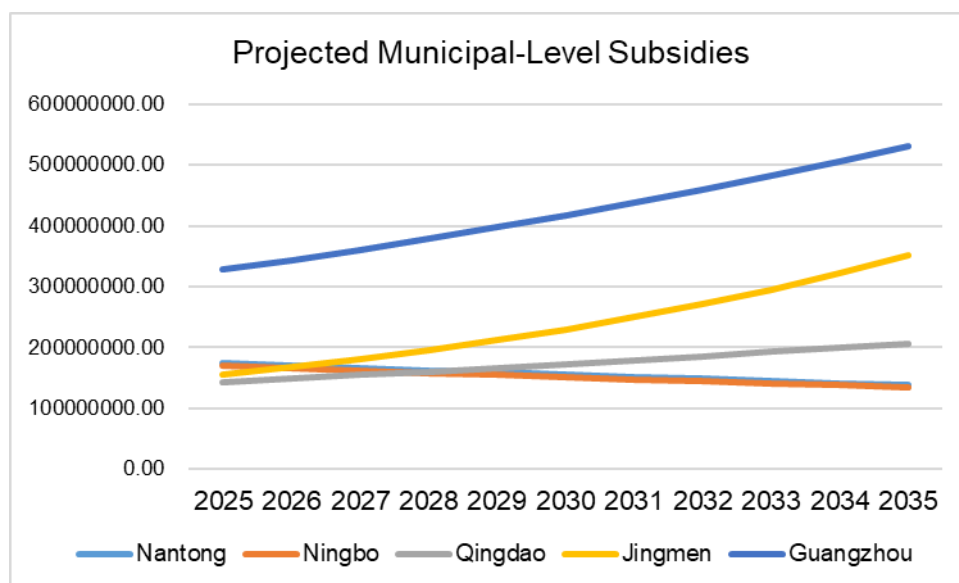


Figure 23 Projected municipal-level LTCI subsidies (2025–2035), above RMB 100 million

Provincial Level

Tables 37 to 39 present projected LTCI fiscal subsidy expenditures for the period 2025–2035 in the 17 provinces corresponding to the selected pilot subsidy policies. The selection criteria for these provinces are consistent with those outlined in the provincial-level results in Section 7.3.1.

Table 37 displays the projections for 13 provinces that adopted fixed-sum subsidy models. There is substantial variation in the annual per capita subsidy standards across these provinces, ranging from RMB 1.4 in Guizhou to RMB 120 in Gansu. Provinces with relatively high subsidy levels include Gansu (RMB 120/person/year), Beijing (RMB 90), and Zhejiang (RMB 60). Provinces with mid-range subsidies include Jiangsu (RMB 40), Shandong (RMB 30), Shaanxi (RMB 20), and Xinjiang (RMB 20). At the lower end, Inner Mongolia and Henan

provide RMB 10 per person per year, Anhui and Jiangxi provide RMB 5, Jilin provides RMB 2, and Guizhou offers the lowest fixed subsidy at RMB 1.4.

Table 38 displays the projected LTCI fiscal subsidies for three provinces that have adopted proportional subsidies: Hubei, Shanxi, and Yunnan. Each of these provinces applies a different calculation base for determining subsidy amounts. Specifically, Hubei uses the previous year's per capita disposable income, Shanxi and Yunnan use the current year's average pension level.

It is important to note that in Shanxi, the LTCI pilot city of Jincheng stipulates that subsidies are provided only to retirees under the UEBMI scheme (Jin Shi Yi Bao Fa [2021] No.5). As individual pension incomes vary significantly, this study uses a proxy for estimation: the average pension level, calculated as the total pension expenditure divided by the number of beneficiaries, based on official data from the provincial statistical bureau. Similarly, in Yunnan, the LTCI pilot city of Kunming specifies that subsidies apply to retirees under UEBMI. The policy document (Kun Zheng Fa [2023] No.5) designates the UEBMI individual account allocation base for retirees as the subsidy calculation base. However, starting in 2021, the General Office of the State Council reformed the medical insurance individual account system, stipulating that the individual account allocation base for UEBMI retirees should be equal to the current year's average pension level in the city (GOV, 2021). Accordingly, for the projection

period 2025–2035, the subsidy calculation base for Yunnan is defined as the average pension level, derived by dividing the total annual pension expenditure by the number of recipients, using data from the provincial statistical bureau.

The most distinctive case is Sichuan Province (Table 39), where the LTCI pilot city, Chengdu, has implemented a mixed subsidy model, combining both fixed-sum and proportional subsidies based on population group. According to Chengdu's LTCI policy, the subsidised population is categorised into three groups: (1) Retirees under UEBMI; (2) Children and students enrolled in RBMI (including those in primary, secondary, and university education); and (3) Other RBMI enrollees.

The first group receives proportional subsidies. Like Kunming (Yunnan Province), Chengdu originally used the UEBMI individual account allocation base for retirees as the subsidy base. However, following the 2021 reform introduced by the General Office of the State Council, this base was redefined as the average pension level of the city in the current year. Therefore, in the provincial-level projections for Sichuan, the subsidy base for proportional subsidies is the current year's average pension level, calculated using provincial statistics. For the second and third groups, fixed-sum subsidies are applied. Children and students receive RMB 10 per person per year, while other RBMI enrollees receive RMB 30 per person per year, in accordance with the

policy provisions.

Regardless of the subsidy type, all LTCI fiscal subsidies are calculated in aggregate by local governments and transferred directly to the LTCI fund, rather than disbursed to individuals.

Table 37 Provincial-level annual fixed-sum LTCI subsidies (2025–2035)

	Jilin	Jiangsu	Zhejiang	Anhui	Jiangxi	Shangdong	
Subsidies (RMB/person/year)	2	40	60	5	5	30	
2025	30799813	1809668327	1470147425	61169734	186820498	836437410	
2026	29750591	1782834815	1412585887	64242320	182759122	866103690	
2027	28737111	1756399186	1357278091	67469243	178786037	896822156	
2028	27758156	1730355541	1304135792	70858256	174899326	928630127	
2029	26812550	1704698068	1253074205	74417501	171097109	961566246	
2030	25899157	1679421040	1204011862	78155529	167377551	995670523	
2031	25016880	1654518816	1156870486	82081320	163738853	1030984391	
2032	24164658	1629985839	1111574863	86204305	160179259	1067550751	
2033	23341468	1605816634	1068052726	90534390	156697049	1105414026	
2034	22546321	1582005807	1026234636	95081977	153290540	1144620214	
2035	21778261	1558548043	986053875	99857991	149958086	1185216944	
	Beijing	Inner Mongolia	Henan	Guizhou	Shaanxi	Xinjiang	Gansu
Subsidies (RMB/person/year)	90	10	10	1.4	20	20	120
2025	363274623	212383223	803652150	51346477.22	182220597	326996684	199710995
2026	363577886	210751490	781874510	51160974.12	191627508	324960512	205799281
2027	363881402	209132293	760687007	50976141.19	201520038	322937019	212073170
2028	364185171	207525536	740073651	50791976.02	211923259	320926127	218538322
2029	364489194	205931124	720018882	50608476.18	222863532	318927756	225200568
2030	364793471	204348962	700507564	50425639.31	234368584	316941829	232065915
2031	365098002	202778955	681524971	50243462.98	246467569	314968267	239140556
2032	365402787	201221011	663056774	50061944.80	259191149	313006995	246430870
2033	365707826	199675036	645089035	49881082.41	272571569	311057936	253943433
2034	366013120	198140939	627608192	49700873.43	286642735	309121013	261685020
2035	366318669	196618628	610601051	49521315.51	301440308	307196151	269662613

Note: The row labelled ‘Subsidies’ refers to the fixed subsidy amount granted per person per year, as specified in each province’s LTCI policy. The remaining values represent the total annual fiscal subsidy expenditure by province, expressed in RMB.

Table 38 Provincial-level annual proportional LTCI subsidies (2025–2035)

Year	Hubei	Shanxi	Yunnan
Subsidies (RMB/year)	$0.4\% \times \text{previous year's per capita disposable income} \times 37.5\% \times \text{subsidised population}$	$\text{Current year's average pension level} \times 0.15\% \times \text{subsidised population}$	$\text{Current year's average pension level} \times 0.2\% \times \text{subsidised population}$
2025	3082278095.37	218367262.31	200243109.12
2026	3302233924.82	234614907.31	215461291.13
2027	3537886120.00	252071460.45	231836032.63
2028	3790354797.70	270826870.80	249455230.48
2029	4060840005.93	290977779.86	268413461.39
2030	4350627429.77	312628019.98	288812490.04
2031	4661094504.12	335889149.08	310761814.84
2032	4993716958.93	360881025.53	334379256.09
2033	5350075834.37	387732425.84	359791588.05
2034	5731864993.85	416581708.28	387135219.96
2035	6140899181.31	447577525.21	416556927.92

Note: The row labelled 'Subsidies' refers to the formula for calculating the annual proportional subsidy, expressed in RMB.

Table 39 Provincial-level annual mixed LTCI subsidies (2025–2035)

Year	Sichuan			
Subsidies (RMB/year)	Retiree under UEBMI: current year's average pension level $\times 0.01\% \times 12 \times \text{subsidised population}$	RBMI-Student & child incl. university: RMB10/person/year	RBMI-Other residents: RMB30/person/year	Total subsidy
2025	271351862.62	139361716	1330668333	1741381911.73
2026	291428171.72	135236123	1291275904	1717940198.96
2027	312989851.86	131232662	1253049629	1697272142.89
2028	336146800.04	127347717	1215954986	1679449502.31
2029	361017044.16	123577780	1179958473	1664553296.61
2030	387727344.59	119919446	1145027582	1652674372.95
2031	416413840.24	116369412	1111130768	1643914020.13
2032	447222742.36	112924471	1078237418	1638384631.30
2033	480311079.90	109581512	1046317826	1636210418.36
2034	515847499.72	106337517	1015343166	1637528182.12
2035	554013126.30	103189555	985285463	1642488144.51

Note: The row labelled 'Subsidies' refers to the formula for calculating the annual proportional subsidy and the fixed subsidy amount granted per person per year, expressed in RMB.

Figures 24 and 25 present the projected provincial-level fixed-sum LTCI subsidies from 2025 to 2035. As shown in Figure 24, Jilin, Guizhou, Jiangxi, and Inner Mongolia exhibit steady downward trends, with relatively slow rates of decline. In contrast, Shaanxi, Gansu, and Anhui show consistent upward trends, with Shaanxi displaying the most rapid growth. Notably, after 2030, Shaanxi's projected fiscal subsidy expenditure surpasses that of Gansu,

despite Gansu having the highest per capita subsidy (RMB 120 per person per year).

A similar pattern is observed in Figure 25 where Shandong's projected expenditure begins close to that of Henan in 2025 (with a difference of only RMB 32,785,260) and eventually surpasses Zhejiang by 2033. Although Shandong's per capita subsidy is lower (RMB 30 per person per year), the projected subsidised population increases steadily. In contrast, Zhejiang, despite offering a higher per capita subsidy (RMB 60), experiences a continuous decline in the subsidised population, resulting in gradually lower total expenditure over time. The remaining provinces shown in Figure 25 demonstrate relatively stable trends, with Beijing and Xinjiang exhibiting the least variation throughout the projection period.

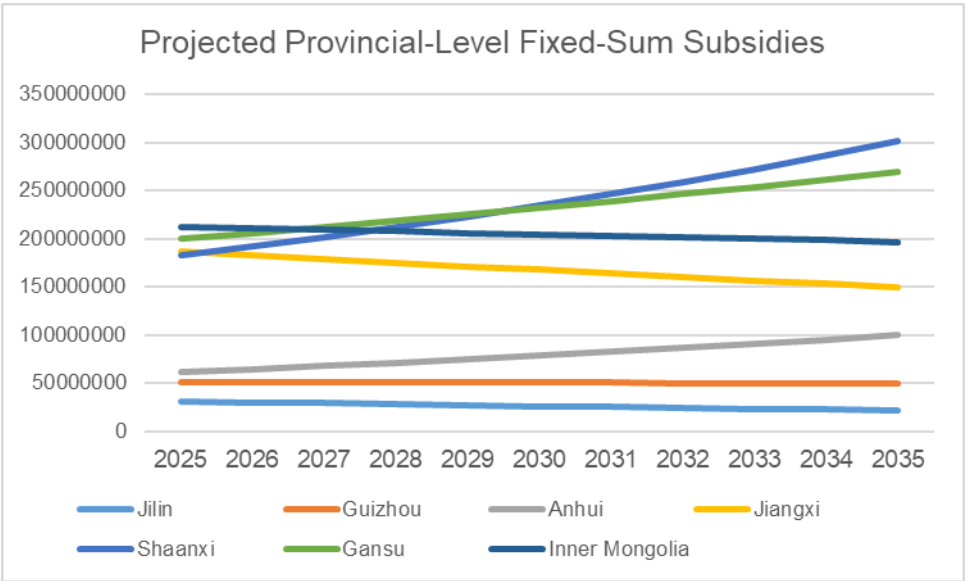


Figure 24 Provincial-level annual fixed-sum LTCI subsidies (2025–2035)

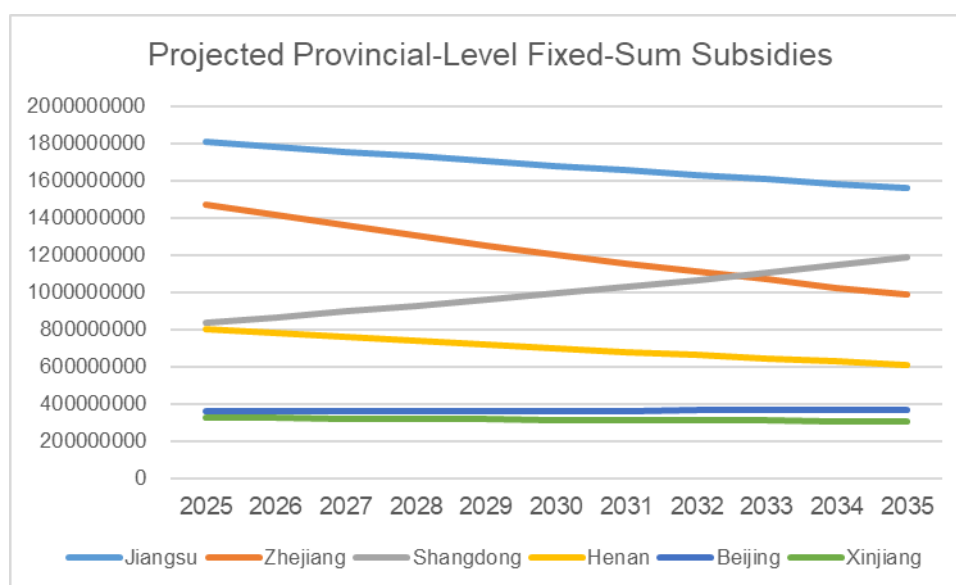


Figure 25 Provincial-level annual fixed-sum LTCI subsidies (2025–2035)

Figure 26 presents the projected fiscal expenditures for proportional LTCI subsidy types, respectively. Notably, Hubei Province provides subsidies to all UEBMI and RBMI enrollees, whereas Shanxi and Yunnan restrict eligibility to retirees under the UEBMI scheme. As a result, Hubei's projected LTCI fiscal subsidy amounts are significantly higher than those of the other two provinces. For instance, in 2035, Hubei's projected subsidy expenditure is approximately 13.7 times that of Shanxi and 14.7 times that of Yunnan. Although the growth trend of subsidy is obvious, the change in subsidised population in Hubei is not obvious (Figure 18). Its total projected subsidised population declines over time, registering a decrease of 805,065 people between 2025 and 2035. In contrast, both Shanxi and Yunnan show upward trends. Shanxi demonstrates the largest increase in subsidised population over the projection period, with a total growth

of 846,487 people, while Yunnan’s grows by 561,488 people during the same period.

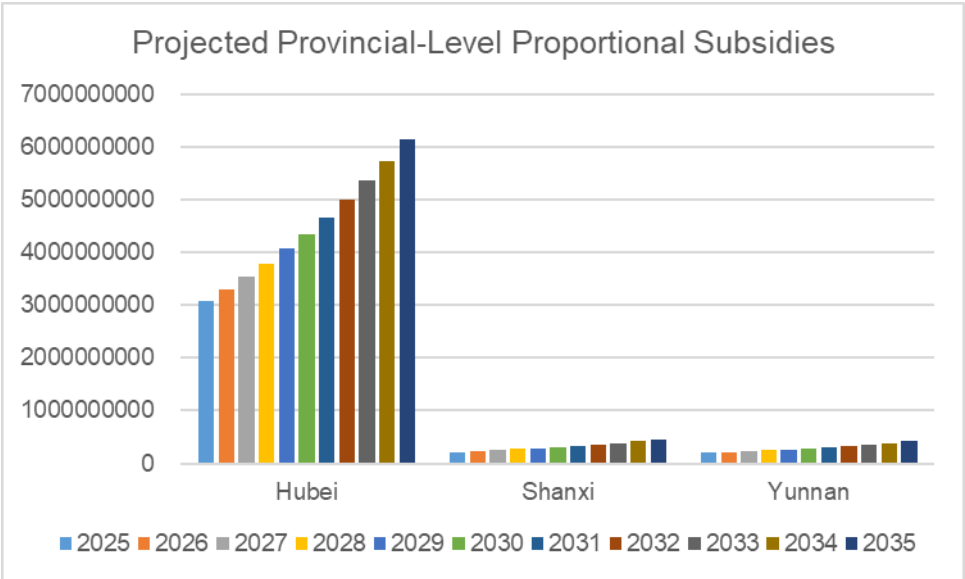


Figure 26 Provincial-level annual proportional LTCL subsidies (2025–2035)

The projected results for the mixed subsidy type (applicable only to Sichuan Province) are shown in Figure 27. The first set of bars reflects the fiscal subsidy allocated to retirees under UEBMI through proportional subsidies. This group exhibits a clear upward trend, with projected expenditures increasing by approximately twofold over the forecast period. In contrast, both subgroups of RBMI enrolees receiving fixed-sum subsidies show declining trends. Among them, the decline in fiscal subsidies for children and students is relatively modest, whereas the decrease for other RBMI residents is more pronounced. As a result of the opposing movements between the increasing proportional subsidies and the declining fixed-sum subsidies, the total LTCL fiscal subsidy

for Sichuan Province follows a curved trajectory from 2025 to 2035, which is first decreasing gradually, then rising slowly again. The turning point in this trend occurs around the year 2033.

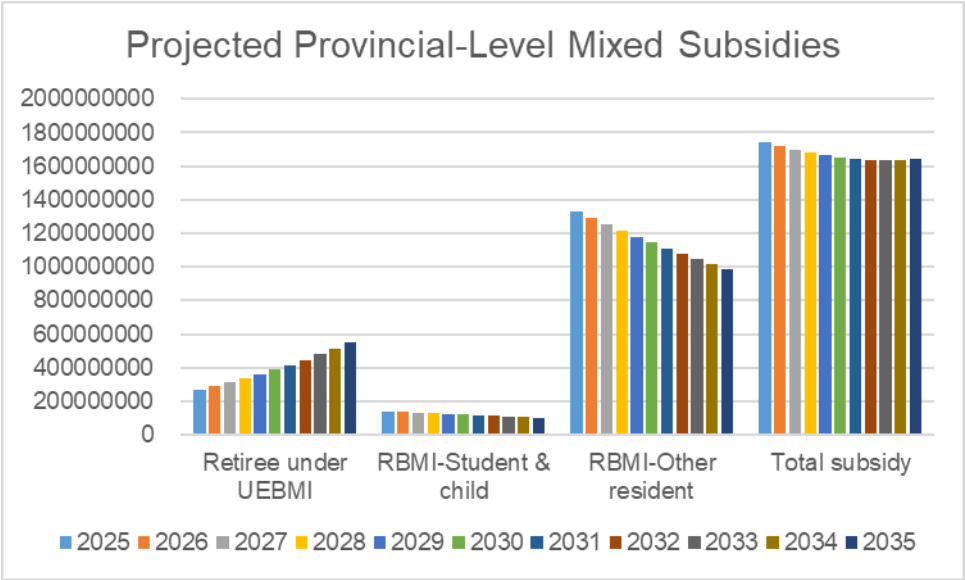


Figure 27 Provincial-level annual mixed LTCI subsidies - Sichuan province (2025–2035)

National Level

The objective of the national-level LTCI fiscal subsidy projections is to assess the fiscal sustainability of each of the 17 selected subsidy policy designs if implemented across mainland China. Since LTCI pilot policies have thus far been implemented only in mainland regions, the national projections exclude Hong Kong, Macao, and Taiwan. Tables 40, 41, and 42 present the projected fiscal expenditures for the period 2025–2035 under three subsidy mechanisms (fixed-sum, proportional, and mixed), each applied to different categories of eligible subsidised groups. ‘Policy’ indicates the LTCI subsidy model adopted

by the corresponding province in which the selected pilot city is located; the column labels represent policy frameworks, not geographic units. ‘Subsidised Group’ indicates the eligible population; the following row shows the fixed subsidy amount or proportional formula, depending on the policy type.

As shown in Table 40, among the fixed-sum subsidy models, three policies target UEBMI enrollees, with per capita annual subsidy amounts of RMB 5, RMB 20, and RMB 30, respectively. All three display an upward trend over the projection period. Two additional fixed-sum subsidy policies are distinct. The first provides subsidies to all basic medical insurance enrollees (both enrollees of UEBMI and RBMI), with a relatively low per capita subsidy of RMB 10. This policy exhibits a declining trend throughout the forecast period. The second targets a narrower group, UEBMI enrollees employed in government departments and public institutions, and offers a significantly higher per capita subsidy of RMB 120. Although this policy shows a modest upward trend, the growth is comparatively gradual.

There are eight fixed-sum subsidy policies targeting RBMI enrollees, with per capita annual subsidy amounts ranging from RMB 1.4 to RMB 90. As shown in Table 33, the number of RBMI enrollees in China is projected to decline significantly over the next decade, with a decrease of approximately 158.9 million between 2025 and 2035. As a result, under fixed-sum subsidy models,

the overall fiscal subsidy amount follows the same downward trend as the subsidised population. The highest projected expenditure occurs in 2025 under the RMB 90 per person per year scheme, reaching approximately RMB 83.67 billion. In contrast, the lowest projected expenditure is recorded in 2035 under the RMB 1.4 per person per year scheme, amounting to approximately RMB 1.08 billion.

Table 40 National-level annual fixed-sum LTCI subsidies (2025–2035)

Policy Subsidised group	Anhui Enrolees of UEBMI	Shangdong Enrolees of UEBMI	Shaanxi Enrolees of UEBMI	Inner Mongolia Enrolees of BMI	Gansu UEBMI-Employed in government and Public Institutions	Jilin Enrolees of RBMI	Jiangsu Enrolees of RBMI
Fixed subsidies (RMB/person/year)	5	30	20	10	120	2	40
2025	1948863417	11693180502	7795453668	13194453805	8225362381	1859345394	37186907883
2026	1996935193	11981611159	7987740773	13117937479	8336597971	1824813419	36496268370
2027	2046192735	12277156411	8184770941	13046999344	8449337855	1790922775	35818455495
2028	2096665292	12579991751	8386661167	12981638343	8563602373	1757661552	35153231037
2029	2148382833	12890297000	8593531334	12921855968	8679412148	1725018060	34500361204
2030	2201376069	13208256416	8805504277	12867656275	8796788075	1692980827	33859616545
2031	2255676467	13534058799	9022705866	12819045900	8915751332	1661538593	33230771868
2032	2311316268	13867897610	9245265074	12776034079	9036323389	1630680308	32613606168
2033	2368328513	14209971080	9473314053	12738632661	9158526000	1600395127	32007902539
2034	2426747055	14560482328	9706988219	12706856136	9282381217	1570672405	31413448107
2035	2486606581	14919639487	9946426325	12680721650	9407911388	1541501698	30830033951
Policy Subsidised group	Zhejiang Enrolees of RBMI	Jiangxi Enrolees of RBMI	Beijing Enrolees of RBMI	Henan Enrolees of RBMI	Guizhou Enrolees of RBMI	Xinjiang Enrolees of RBMI	
Fixed subsidies (RMB/person/year)	60	5	90	10	1.4	20	
2025	55780361824	4648363485	83670542736	9296726971	1301541776	18593453941	
2026	54744402556	4562033546	82116603834	9124067093	1277369393	18248134185	
2027	53727683242	4477306937	80591524863	8954613874	1253645942	17909227747	
2028	52729846555	4394153880	79094769833	8788307759	1230363086	17576615518	
2029	51750541806	4312545151	77625812709	8625090301	1207512642	17250180602	
2030	50789424817	4232452068	76184137226	8464904136	1185086579	16929808272	
2031	49846157803	4153846484	74769236704	8307692967	1163077015	16615385934	
2032	48920409251	4076700771	73380613877	8153401542	1141476216	16306803084	
2033	48011853808	4000987817	72017780712	8001975635	1120276589	16003951269	
2034	47120172161	3926681013	70680258241	7853362027	1099470684	15706724054	
2035	46245050927	3853754244	69367576390	7707508488	1079051188	15415016976	

Table 41 presents the projected LTCI fiscal subsidy expenditures from 2025 to 2035 under three proportional subsidy models, based on national-level data. As shown in Table 33, although the number of UEBMI enrolees is projected to increase over the forecast period, the more rapid decline in RBMI enrolment results in an overall downward trend in the combined BMI population (i.e., total enrolees under either UEBMI or RBMI schemes). Meanwhile, historical data published by the National Bureau of Statistics indicate that China's per capita

disposable income grew at a compound annual growth rate (CAGR) of approximately 6.44 per cent from 2020 to 2024. In contrast, the decline rate of the BMI-enrolled population over the same projection period is estimated at only 0.4 per cent. This disparity, where economic growth outpaces population decline, leads to an inverse trend between the number of subsidised individuals and the total fiscal expenditure. As a result, the projected LTCI fiscal subsidies under the proportional model targeting the BMI population increase by approximately 1.79 times between 2025 and 2035. This subsidy scheme results in the highest fiscal expenditure among all three types, with a peak value reaching RMB 146,660,075,250.83.

In contrast, the two proportional subsidy models targeting retirees under the UEBMI scheme both exhibit a consistent upward trend in projected fiscal expenditure. This reflects, to a significant extent, the fiscal impact of population ageing. As shown in Table 33, the number of retirees is projected to increase by approximately 1.4 times between 2025 and 2035. Moreover, the subsidy calculation base for this group (the average pension level) is an economic indicator that is expected to rise steadily over the projection period. Consequently, LTCI-related fiscal expenditure is subject to dual upward pressures: one stemming from the growing size of the elderly population, and the other from the increasing per capita subsidy amount driven by rising pension levels.

Table 41 National-level annual proportional LTCI subsidies (2025–2035)

Policy Subsidised group Subsidies (RMB/year)	Hubei Enrolees of BMI 0.4% × previous year's per capita disposable income × 37.5% × subsidised population	Shanxi Retirees under UEBMI Current year's average pension level × 0.15% × subsidised population	Yunnan Retirees under UEBMI Current year's average pension level × 0.2% × subsidised population
2025	81767329880.30	8217315758.45	10956421011.26
2026	86527052367.35	8770528333.48	11694037777.97
2027	91599888836.08	9360984719.28	12481312959.04
2028	97008941405.89	9991192272.89	13321589697.19
2029	102779170648.80	10663827153.60	14218436204.80
2030	108937553529.75	11381745687.19	15175660916.25
2031	115513255193.66	12147996495.25	16197328660.33
2032	122537815833.10	12965833441.05	17287777921.40
2033	130045353981.91	13838729447.02	18451639262.70
2034	138072787700.50	14770391242.38	19693854989.84
2035	146660075250.83	15764775103.68	21019700138.25

The mixed subsidy model, which combines both fixed-sum and proportional subsidy mechanisms, exhibits a fiscal expenditure trend that closely aligns with changes in the size of the subsidised population (Table 42). In terms of overall spending, this model falls within a moderate range, neither representing the highest nor the lowest projected expenditure among the three subsidy schemes.

Table 42 National-level annual mixed LTCI subsidies (2025–2035)

Policy Subsidised group Subsidies (RMB/year)	Retiree under UEBMI Retiree under UEBMI: current year's average pension level × 0.01% × 12 × subsidised population	Sichuan RBMI (Adult+children&student) RBMI-Student & child incl. university: RMB10/person/year; Other residents: RMB30/person/year	Total subsidy
2025	6573852606.76	22735469342	29309321948.66
2026	7016422666.78	22253497080	29269919746.65
2027	7488787775.43	21780893269	29269681044.34
2028	7992953818.32	21317481008	29310434826.05
2029	8531061722.88	20863086693	29394148416.04
2030	9105396549.75	20417539969	29522936518.31
2031	9718397196.20	19980673663	29699070859.55
2032	10372666752.84	19552323730	29924990482.51
2033	11070983557.62	19132329184	30203312741.65
2034	11816312993.91	18720532058	30536845052.18
2035	12611820082.95	18316777333	30928597416.31

This section has presented the projected LTCI fiscal subsidy expenditures for the period 2025–2035 across three administrative levels (municipal, provincial, and national levels) and under three subsidy mechanisms (fixed-sum, proportional, and mixed). To evaluate the potential fiscal pressure associated with scaling up these subsidy policies, the next section will project the fiscal revenues (GPBR). Then, based on the projected subsidies and GPBR, the Subsidies-to-GPBR ratio will be calculated to assess the fiscal sustainability of LTCI subsidies and the feasibility of implementing each pilot policy on a broader scale.

7.3.3 GPBR and Subsidies-to-GPBR ratio

General Public Budget Revenues (GPBR)

Table 43, 44, and 45 present the projected results of GPBR from 2025 to 2035 across three administrative levels: municipal, provincial, and national, including 13 pilot cities, 17 pilot provinces, and mainland China. The projected results of this indicator illustrate the anticipated trajectory of GPBR in regions piloting LTCI over the coming decade (unit: RMB/year). Furthermore, it provides essential data for the subsequent calculation of the subsidies-to-GPBR ratio.

As presented in Table 43, municipal-level GPBR are projected to follow a consistently upward trajectory throughout the forecast horizon (2025–2035). The pattern of growth appears broadly linear with a gradual acceleration over

time, without marked structural breaks or pronounced volatility. This sustained expansion may reflect local governments' ongoing commitment to strengthening the fiscal base for public services, including healthcare, although the pace of increase remains moderate relative to that observed at higher tiers of government.

Figure 28 further illustrates the heterogeneity in projected GPBR growth across the pilot municipalities. While the aggregate trend is positive, the scale and speed of growth vary substantially. Cities such as Changchun, Ningbo, Qingdao, Urumqi, and Guangzhou demonstrate markedly higher revenue levels. By contrast, municipalities including Jingmen, Hanzhong, and Qianxinan exhibit comparatively modest revenue level, indicating a more restrained fiscal capacity over the projection period.

Table 43 Municipal-level general public budget revenues (2025–2035)

Year	Changchun	Nantong	Ningbo	Anqing	Shangrao	Qingdao	Hohhot
2025	77993685208.64	70500492805.00	182360000000.00	22511949636.00	30157533871.00	132398000000.00	26070453744.00
2026	83615223678.60	71993525570.00	185622000000.00	24563858120.00	32040479172.00	132170000000.00	27037871726.00
2027	89641944884.63	73518177218.00	188942000000.00	26802792984.00	34040989888.00	131944000000.00	28041188490.00
2028	96103053118.49	75075117362.00	192322000000.00	29245801219.00	36166406449.00	131717000000.00	29081736163.00
2029	103029857625.05	76665029796.00	195762000000.00	31911483607.00	38424527598.00	131491000000.00	30160896303.00
2030	110455924320.64	78288612793.00	199263000000.00	34820136346.00	40823639010.00	131265000000.00	31280101735.00
2031	118417238446.80	79946579417.00	202827000000.00	37993905582.00	43372543690.00	131040000000.00	32440838452.00
2032	126952378947.66	81639657831.00	206455000000.00	41456956028.00	46080594277.00	130815000000.00	33644647590.00
2033	136102705415.73	83368591619.00	210148000000.00	45235654951.00	48957727360.00	130591000000.00	34893127474.00
2034	145912558512.35	85134140113.00	213907000000.00	49358772926.00	52014499941.00	130367000000.00	36187935738.00
2035	156429474833.62	86937078725.00	217733000000.00	53857702898.00	55262128167.00	130143000000.00	37530791528.00
Year	Kaifeng	Qianxinan	Hanzhong	Urumqi	Jingmen	Guangzhou	
2025	25587777225.00	11472600040.00	5791158212.00	80162225413.00	15862218161.00	198656000000.00	
2026	27939530681.00	11503972169.00	6005481472.00	87291122521.00	16822877761.00	201828000000.00	
2027	30507432038.00	11535430087.00	6227736557.00	95053998709.00	17841717551.00	205050000000.00	
2028	33311347287.00	11566974027.00	6458217015.00	103507000000.00	18922261083.00	208323000000.00	
2029	36372968288.00	11598604225.00	6697227256.00	112712000000.00	20068245306.00	211649000000.00	
2030	39715980584.00	11630320916.00	6945082957.00	122736000000.00	21283633489.00	215028000000.00	
2031	43366246639.00	11662124338.00	7202111475.00	133651000000.00	22572628926.00	218461000000.00	
2032	47352005915.00	11694014726.00	7468652286.00	145537000000.00	23939689475.00	221948000000.00	
2033	51704093344.00	11725992320.00	7745057427.00	158479000000.00	25389542974.00	225492000000.00	
2034	56456177871.00	11758057358.00	8031691963.00	172573000000.00	26927203593.00	229092000000.00	
2035	61645022931.00	11790210078.00	8328934473.00	187920000000.00	28557989172.00	232749000000.00	

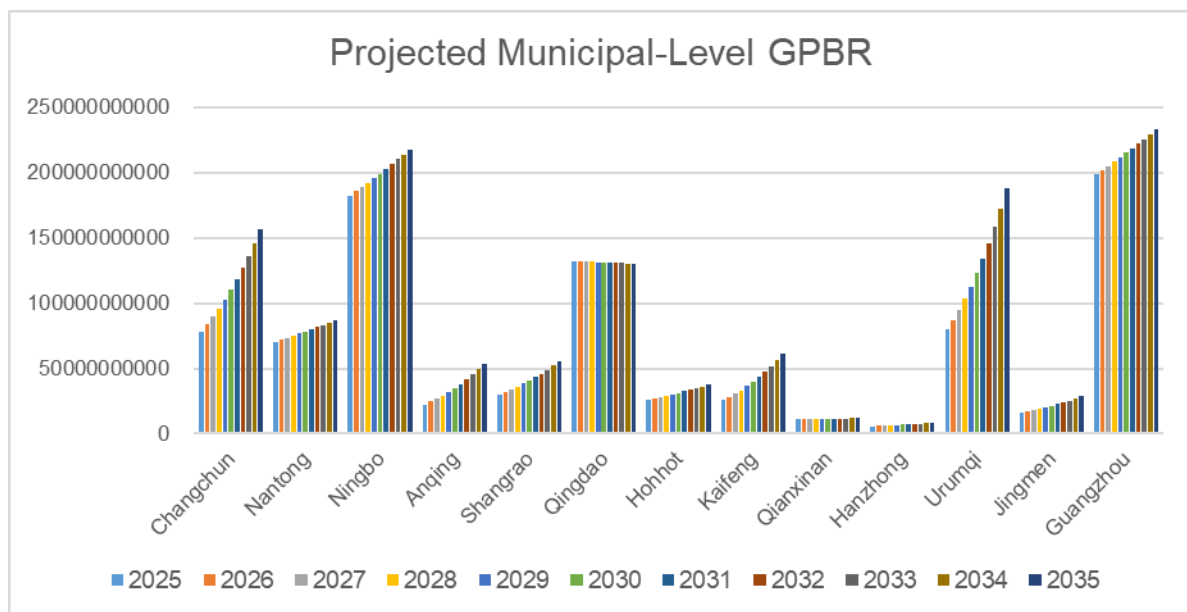


Figure 28 Projected municipal-level GPBR (2025–2035)

Table 44 presents the projected results for provincial-level GPBR, which display a consistently upward trend over the period 2025–2035. Compared with the municipal level, inter-provincial disparities appear more pronounced, reflecting underlying differences in economic structures and fiscal capacities.

As shown in Figure 29, three broad patterns of growth can be identified: rapid acceleration, steady expansion, and comparatively modest increases. Provinces such as Inner Mongolia, Shanxi, Shaanxi, Sichuan, and Xinjiang demonstrate substantial growth, with their 2035 GPBR levels projected to be three to four times those of 2025. A second group, including Anhui, Beijing, Guizhou, Yunnan, and Gansu, also records strong and sustained increases, with 2035 GPBR projected to exceed 1.5 times the 2025 level. In contrast, Jilin and Henan exhibit markedly slower growth, with their 2035 revenues rising only

marginally above 2025 levels.

According to 2020 data on regional GDP per capita published by the National Bureau of Statistics, Beijing, Jiangsu, and Zhejiang ranked among the top five of the 17 pilot provinces. The forecast suggests that provinces with stronger economic bases are likely to maintain higher GPBR levels, consistent with their relatively advanced levels of economic development. Conversely, less economically developed provinces such as Gansu, Guizhou, Yunnan, and Jilin are projected to remain at the lower end of the distribution, both in terms of absolute GPBR and regional GDP per capita. This divergence underscores the close association between fiscal capacity and regional economic performance, as well as the challenges of achieving balanced development across provinces.

Table 44 Provincial-level general public budget revenues (2025–2035)

Year	Jilin	Jiangsu	Zhejiang	Anhui	Jiangxi	Shandong
2025	121534000000.00	1069970000000.00	912944000000.00	428710000000.00	319454000000.00	803068000000.00
2026	124296000000.00	1105380000000.00	949317000000.00	451833000000.00	328908000000.00	831930000000.00
2027	127121000000.00	1141950000000.00	987139000000.00	476203000000.00	338641000000.00	861829000000.00
2028	130011000000.00	1179730000000.00	1026470000000.00	501887000000.00	348663000000.00	892803000000.00
2029	132966000000.00	1218770000000.00	1067360000000.00	528957000000.00	358981000000.00	924890000000.00
2030	135988000000.00	1259100000000.00	1109890000000.00	557487000000.00	369604000000.00	958130000000.00
2031	139079000000.00	1300760000000.00	1154110000000.00	587555000000.00	380542000000.00	992564000000.00
2032	142240000000.00	1343800000000.00	1200090000000.00	619246000000.00	391803000000.00	1028240000000.00
2033	145473000000.00	1388260000000.00	1247900000000.00	652645000000.00	403398000000.00	1065190000000.00
2034	148780000000.00	1434190000000.00	1297620000000.00	687846000000.00	415336000000.00	1103470000000.00
2035	152161000000.00	1481650000000.00	1349320000000.00	724946000000.00	427627000000.00	1143130000000.00
Year	Beijing	Inner Mongolia	Henan	Guizhou	Shaanxi	Xinjiang
2025	778342000000.00	411547000000.00	466598000000.00	222580000000.00	465516000000.00	282982000000.00
2026	814819000000.00	472245000000.00	476942000000.00	231908000000.00	532397000000.00	323723000000.00
2027	853005000000.00	541896000000.00	487514000000.00	241626000000.00	608887000000.00	370329000000.00
2028	892980000000.00	621820000000.00	498321000000.00	251751000000.00	696366000000.00	423646000000.00
2029	934829000000.00	713531000000.00	509368000000.00	262301000000.00	796413000000.00	484638000000.00
2030	978640000000.00	818768000000.00	520659000000.00	273293000000.00	910834000000.00	554411000000.00
2031	1024500000000.00	939527000000.00	532201000000.00	284745000000.00	1041690000000.00	634230000000.00
2032	1072520000000.00	1078100000000.00	543998000000.00	296677000000.00	1191360000000.00	725541000000.00
2033	1122780000000.00	1237100000000.00	556058000000.00	309110000000.00	1362520000000.00	829997000000.00
2034	1175400000000.00	1419560000000.00	568384000000.00	322063000000.00	1558270000000.00	949492000000.00
2035	1230480000000.00	1628930000000.00	580984000000.00	335559000000.00	1782150000000.00	1086190000000.00
Year	Hubei	Shanxi	Yunnan	Sichuan	Gansu	
2025	402262000000.00	474863000000.00	267107000000.00	642022000000.00	116820000000.00	
2026	413701000000.00	542427000000.00	278737000000.00	696085000000.00	122544000000.00	
2027	425465000000.00	619603000000.00	290873000000.00	754702000000.00	128550000000.00	
2028	437564000000.00	707760000000.00	303538000000.00	818254000000.00	134849000000.00	
2029	450007000000.00	808460000000.00	316753000000.00	887158000000.00	141458000000.00	
2030	462804000000.00	923488000000.00	330545000000.00	961864000000.00	148390000000.00	
2031	475964000000.00	1054880000000.00	344937000000.00	1042860000000.00	155662000000.00	
2032	489499000000.00	1204970000000.00	359955000000.00	1130680000000.00	163290000000.00	
2033	503419000000.00	1376410000000.00	375627000000.00	1225890000000.00	171292000000.00	
2034	517735000000.00	1572250000000.00	391982000000.00	1329120000000.00	179686000000.00	
2035	532457000000.00	1795950000000.00	409049000000.00	1441050000000.00	188492000000.00	

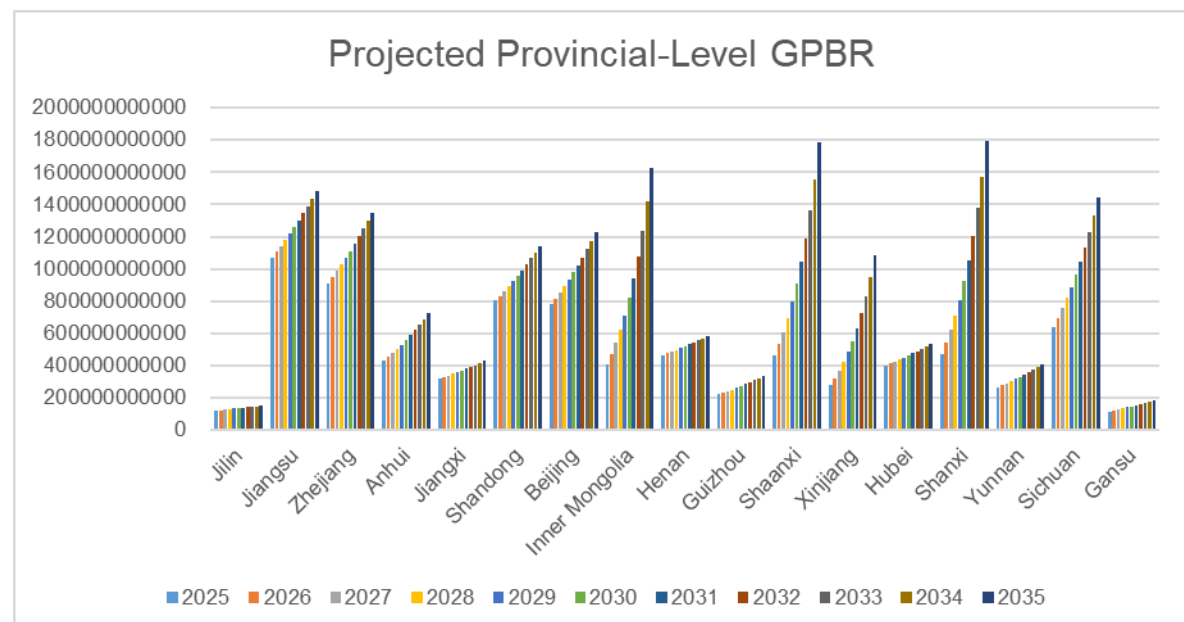


Figure 29 Projected provincial-level GPBR (2025–2035)

From the overall trend, the national-level GPBR is projected to display a sustained upward trajectory between 2025 and 2035 (Table 45). The growth curve is approximately linear to mildly accelerating, with no evident fluctuations or structural declines. This indicates that, at the macro-fiscal level, the national revenue base is expected to expand gradually and maintain steady growth. Numerically, the national GPBR in 2035 is estimated to be around 1.5 times higher than in 2025. Compared with provincial and municipal forecasts, the national-level growth appears smoother, without extreme deviations, thereby reflecting the stability and resilience of central government finance.

From a policy perspective, national-level fiscal revenue is likely to continue its stable growth, which may be associated with steady economic expansion, a broadening tax base, and ongoing reforms in public finance. The growth rate at the national level is faster than that of some provinces with relatively low revenue bases (such as Henan and Jilin), but slightly lower than that of certain rapidly expanding provinces (for example, Inner Mongolia and Xinjiang). This suggests that central fiscal expansion prioritises stability over volatility. The robust growth of national-level budgetary revenue provides a reliable financial foundation for sustaining public expenditure on social security.

Table 45 National-level general public budget revenues (2025–2035)

Year	GPBR
2025	11598741564060.70
2026	12041899374561.90
2027	12501989094781.40
2028	12979657649042.40
2029	13475576678967.70
2030	13990443487863.40
2031	14524982021184.30
2032	15079943884462.70
2033	15656109400127.50
2034	16254288704701.90
2035	16875322887922.90

The comparison results of the change trend of GPBR 2025–2035 forecast results of the three administrative levels are as follows:

Level	Trend	Volatility	Growth Rate
Municipal	Steadily upward but heterogeneous	Highest, with substantial disparities among cities	Moderate on average but highly uneven across cities
Provincial	Consistently upward, with distinct growth clusters	Pronounced but more structured across provinces	Relatively strong, ranging from 1.2- to 4-fold increases
National	Smooth and steadily upward, approximating linear-to-mildly exponential growth	Lowest, with regional differences largely smoothed out	Stable, with an overall increase of about 1.4-fold

Overall, the comparison across municipal, provincial, and national levels of GPBR demonstrates a clear pattern of decreasing volatility and increasing stability as the scale rises. Municipal revenues exhibit the greatest heterogeneity, with moderate but highly uneven growth. Provincial revenues show stronger overall expansion, though marked by distinct regional clusters and pronounced disparities. At the national level, however, the trajectory smooths into a steady near-linear rise, with regional fluctuations largely absorbed, resulting in a reliable overall increase of around 1.4-fold. This hierarchical pattern highlights the stabilising role of central finance in offsetting localised volatility.

Subsidies-to-GPBR Ratio

Tables 46, 47, and 48 present the projected subsidies-to-GPBR ratio for municipal, provincial, and national levels under different LTCI pilot subsidy standards over the forecast period (2025–2035). This ratio serves as an indicator for the fiscal pressure imposed by LTCI-related subsidies within the broader context of public healthcare financing. A rising ratio indicates a growing fiscal commitment to LTCI, while a declining ratio suggests a relative easing of fiscal pressure.

Table 46 Municipal-level subsidies-to-GPBR ratio (2025–2035)

Year	Changchun	Nantong	Ningbo	Anqing	Shangrao	Qingdao	Hohhot
2025	0.00016	0.00247	0.00093	0.00013	0.00099	0.00109	0.00091
2026	0.00015	0.00236	0.00089	0.00013	0.00092	0.00113	0.00087
2027	0.00014	0.00226	0.00086	0.00012	0.00086	0.00117	0.00084
2028	0.00013	0.00216	0.00082	0.00012	0.00079	0.00122	0.00081
2029	0.00013	0.00207	0.00079	0.00011	0.00074	0.00126	0.00079
2030	0.00012	0.00198	0.00076	0.00010	0.00068	0.00131	0.00076
2031	0.00011	0.00190	0.00073	0.00010	0.00063	0.00136	0.00073
2032	0.00010	0.00181	0.00070	0.00010	0.00059	0.00142	0.00071
2033	0.00010	0.00174	0.00067	0.00009	0.00055	0.00147	0.00068
2034	0.00009	0.00166	0.00064	0.00009	0.00051	0.00153	0.00066
2035	0.00009	0.00159	0.00062	0.00008	0.00047	0.00159	0.00064
Year	Kaifeng	Qianxinan	Hanzhong	Urumqi	Jingmen	Guangzhou	
2025	0.00134	0.000376	0.00126	0.00025	0.00985	0.00165	
2026	0.00116	0.000377	0.00121	0.00023	0.01001	0.00170	
2027	0.00100	0.000378	0.00115	0.00021	0.01018	0.00176	
2028	0.00087	0.000378	0.00110	0.00019	0.01037	0.00182	
2029	0.00075	0.000379	0.00106	0.00017	0.01058	0.00188	
2030	0.00065	0.000380	0.00101	0.00016	0.01080	0.00194	
2031	0.00056	0.000381	0.00097	0.00014	0.01105	0.00200	
2032	0.00048	0.000381	0.00093	0.00013	0.01132	0.00207	
2033	0.00042	0.000382	0.00089	0.00012	0.01161	0.00214	
2034	0.00036	0.000383	0.00085	0.00011	0.01193	0.00221	
2035	0.00031	0.000384	0.00081	0.00010	0.01228	0.00228	

At the municipal level (Table 46), the projected subsidies-to-GPBR ratio demonstrates noticeable variation across pilot cities. While most cities display

a distinct downward trend, indicating that the share of fiscal subsidies within local government revenue is gradually declining and the associated fiscal pressure is correspondingly easing, several cases stand out. For instance, Urumqi, Shangrao, and Kaifeng show particularly pronounced reductions, with Kaifeng experiencing a decline of more than 70 per cent. This reflects the combined effect of relatively low fixed subsidy standards and more rapid economic growth.

In contrast, some cities exhibit characteristics that diverge from the overall pattern. Qingdao and Guangzhou both demonstrate a sustained upward trajectory across the entire period, with increases exceeding 35 per cent over ten years. This suggests a deepening reliance on subsidies and a continually mounting fiscal pressure. Similarly, Qianxinan reveals a moderate upward trend, whereas Jingmen's ratio remains virtually unchanged (a growth rate of only 2 per cent), indicating the emergence of a relatively stable equilibrium between subsidy inputs and economic growth in that locality.

Table 47 Provincial-level subsidies-to-GPBR ratio (2025–2035)

Year	Jilin	Jiangsu	Zhejiang	Anhui	Jiangxi	Shandong	Beijing	Inner Mongolia	Henan
2025	0.00025	0.00169	0.00161	0.000143	0.00058	0.001042	0.00047	0.00052	0.00172
2026	0.00024	0.00161	0.00149	0.000142	0.00056	0.001041	0.00045	0.00045	0.00164
2027	0.00023	0.00154	0.00137	0.000142	0.00053	0.001041	0.00043	0.00039	0.00156
2028	0.00021	0.00147	0.00127	0.000141	0.00050	0.001040	0.00041	0.00033	0.00149
2029	0.00020	0.00140	0.00117	0.000141	0.00048	0.001040	0.00039	0.00029	0.00141
2030	0.00019	0.00133	0.00108	0.000140	0.00045	0.001039	0.00037	0.00025	0.00135
2031	0.00018	0.00127	0.00100	0.000140	0.00043	0.001039	0.00036	0.00022	0.00128
2032	0.00017	0.00121	0.00093	0.000139	0.00041	0.001038	0.00034	0.00019	0.00122
2033	0.00016	0.00116	0.00086	0.000139	0.00039	0.001038	0.00033	0.00016	0.00116
2034	0.00015	0.00110	0.00079	0.000138	0.00037	0.001037	0.00031	0.00014	0.00110
2035	0.00014	0.00105	0.00073	0.000138	0.00035	0.001037	0.00030	0.00012	0.00105
Year	Guizhou	Shaanxi	Xinjiang	Hubei	Shanxi	Yunnan	Sichuan	Gansu	
2025	0.00023	0.00039	0.00116	0.00766	0.00046	0.00075	0.00271	0.00171	
2026	0.00022	0.00036	0.00100	0.00798	0.00043	0.00077	0.00247	0.00168	
2027	0.00021	0.00033	0.00087	0.00832	0.00041	0.00080	0.00225	0.00165	
2028	0.00020	0.00030	0.00076	0.00866	0.00038	0.00082	0.00205	0.00162	
2029	0.00019	0.00028	0.00066	0.00902	0.00036	0.00085	0.00188	0.00159	
2030	0.00018	0.00026	0.00057	0.00940	0.00034	0.00087	0.00172	0.00156	
2031	0.00018	0.00024	0.00050	0.00979	0.00032	0.00090	0.00158	0.00154	
2032	0.00017	0.00022	0.00043	0.01020	0.00030	0.00093	0.00145	0.00151	
2033	0.00016	0.00020	0.00037	0.01063	0.00028	0.00096	0.00133	0.00148	
2034	0.00015	0.00018	0.00033	0.01107	0.00026	0.00099	0.00123	0.00146	
2035	0.00015	0.00017	0.00028	0.01153	0.00025	0.00102	0.00114	0.00143	

At the provincial level (Table 47), the projected subsidies-to-GPBR ratio reveals even greater variation in fiscal pressure trends across regions than at the municipal level. While 17 selected pilot regions display a downward trajectory in the share of subsidies within GPBR, only two pilot regions (Hubei and Yunnan) exhibit an upward trend, with substantial increases of 50.5 per cent and 35.8 per cent, respectively.

As LTCI programmes expand, regions that experienced only mild changes at the municipal level may encounter a more pronounced decline when extrapolated to the provincial level. For instance, in Urumqi, the ratio decreased by approximately 60 per cent between 2025 and 2035. However, when the LTCI pilot subsidy policy is extended to cover the entire Xinjiang Province, the decline becomes considerably steeper, amounting to 75.5 per cent over the same period.

An interesting phenomenon is that certain subsidy policies demonstrate an upward trend at the municipal level during the 2025–2035 period yet shift to a downward trajectory once extended to the provincial level. For example, in Qianxinan Autonomous Prefecture, fiscal subsidies as a proportion of budget revenues increased by 2 per cent by 2035. However, when extended to the broader Guizhou Province, the ratio instead declined by 36 per cent over the same timeframe. Furthermore, as noted earlier, proportional subsidies (owing to their linkage with economic development) may lead to a heavier fiscal pressure. This is exemplified by Hubei and Yunnan, where reliance on such subsidies results in an increasing fiscal strain. By contrast, Shanxi also adopts a proportional subsidy model but exhibits a reduction in fiscal pressure, with the ratio projected to fall markedly by 45.8 per cent between 2025 and 2035. This divergence may be attributable to the province's comparatively rapid economic growth, as its GPBR are expected to expand by 3.8 times by 2035.

Table 48 Projected national-level subsidies-to-GPBR ratio assuming policy expansion from pilot provinces (2025–2035)

Year	Anhui	Shandong	Shaanxi	Inner Mongc	Gansu	Jilin	Jiangsu	Zhejiang	Jiangxi
2025	0.00017	0.00101	0.00067	0.00114	0.00071	0.00016	0.00321	0.00481	0.00040
2026	0.00017	0.00099	0.00066	0.00109	0.00069	0.00015	0.00303	0.00455	0.00038
2027	0.00016	0.00098	0.00065	0.00104	0.00068	0.00014	0.00287	0.00430	0.00036
2028	0.00016	0.00097	0.00065	0.00100	0.00066	0.00014	0.00271	0.00406	0.00034
2029	0.00016	0.00096	0.00064	0.00096	0.00064	0.00013	0.00256	0.00384	0.00032
2030	0.00016	0.00094	0.00063	0.00092	0.00063	0.00012	0.00242	0.00363	0.00030
2031	0.00016	0.00093	0.00062	0.00088	0.00061	0.00011	0.00229	0.00343	0.00029
2032	0.00015	0.00092	0.00061	0.00085	0.00060	0.00011	0.00216	0.00324	0.00027
2033	0.00015	0.00091	0.00061	0.00081	0.00058	0.00010	0.00204	0.00307	0.00026
2034	0.00015	0.00090	0.00060	0.00078	0.00057	0.00010	0.00193	0.00290	0.00024
2035	0.00015	0.00088	0.00059	0.00075	0.00056	0.00009	0.00183	0.00274	0.00023
Year	Beijing	Henan	Guizhou	Xinjiang	Hubei	Shanxi	Yunnan	Sichuan	
2025	0.00721	0.00080	0.00011	0.00160	0.00705	0.00071	0.00094	0.00253	
2026	0.00682	0.00076	0.00011	0.00152	0.00719	0.00073	0.00097	0.00243	
2027	0.00645	0.00072	0.00010	0.00143	0.00733	0.00075	0.00100	0.00234	
2028	0.00609	0.00068	0.00009	0.00135	0.00747	0.00077	0.00103	0.00226	
2029	0.00576	0.00064	0.00009	0.00128	0.00763	0.00079	0.00106	0.00218	
2030	0.00545	0.00061	0.00008	0.00121	0.00779	0.00081	0.00108	0.00211	
2031	0.00515	0.00057	0.00008	0.00114	0.00795	0.00084	0.00112	0.00204	
2032	0.00487	0.00054	0.00008	0.00108	0.00813	0.00086	0.00115	0.00198	
2033	0.00460	0.00051	0.00007	0.00102	0.00831	0.00088	0.00118	0.00193	
2034	0.00435	0.00048	0.00007	0.00097	0.00849	0.00091	0.00121	0.00188	
2035	0.00411	0.00046	0.00006	0.00091	0.00869	0.00093	0.00125	0.00183	

Table 48 presents the projected subsidies-to-GPBR ratio for the national level from 2025 to 2035. Although the format of the national-level subsidies-to-GPBR ratio projection table resembles that of the provincial-level table, their interpretations differ. In the provincial-level table (Table 47), the bolded column headers refer directly to the names of the pilot provinces. By contrast, in the national-level table (Table 48), the bolded column headers indicate the LTCI subsidy model adopted by the corresponding the province in which the selected pilot city is located. In this context, each column in the national table reflects the projected fiscal pressure that would result from scaling up the subsidy model of a specific pilot region to the entire mainland China, rather than the pressure incurred by that specific region itself. Therefore, the column labels represent policy frameworks, not geographic units.

At the national level, the projected subsidies-to-GPBR ratio provides a macroscopic perspective on the fiscal implications of scaling up LTCI policies, under the assumption that pilot models are uniformly implemented across mainland China. Unlike at the municipal and provincial levels, the distinction between the three subsidy models (fixed-sum, proportional, and mixed) becomes particularly pronounced in the national scenario. Fixed-sum mechanisms, as well as mixed models, which are not directly tied to the pace of economic growth, display a downward trend in fiscal pressure over time. By contrast, proportional subsidy schemes (being explicitly linked to economic development) exhibit a rising fiscal pressure, with projected increases exceeding 20 per cent in provinces such as Hubei policy, Yunnan policy, and Shanxi policy. This suggests that while proportional subsidies may ensure the sustainability of funding in line with revenue growth, they also risk embedding a structural rise in fiscal dependence, thereby exacerbating long-term budgetary pressures at the national level.

The temporal evolution of the ratio reflects both the scalability and fiscal efficiency of different subsidy models when extended beyond their pilot regions. Among the provinces adopting fixed-sum subsidy approaches, regions such as Anhui policy, Shandong policy, and Shaanxi policy exhibit a relatively stable downward trajectory, with the subsidies-to-GPBR ratio falling by approximately

12.3 per cent between 2025 and 2035. By contrast, several other fixed-sum subsidy provinces (policies in Jilin, Jiangsu, Zhejiang, Jiangxi, Beijing, Henan, Guizhou, and Xinjiang) experience a markedly steeper decline, with uniform reductions of around 43 per cent over the same period. This indicates that, if implemented at the national scale, fiscal commitment under these subsidy policies would diminish substantially, thereby alleviating the overall budgetary pressure.

7.4 Chapter Summary and Synthesis of Key Implications

This chapter systematically evaluates the fiscal sustainability of expanding China's LTCI system at the municipal, provincial, and national levels from 2025 to 2035, based on the GM (1,1) grey prediction model and a cell-based aggregation forecasting method. Through projections of the insured population, fiscal subsidy amounts, and their proportion relative to GPBR, this chapter reveals the impact of different subsidy models (fixed-sum, proportional subsidy, and mixed subsidy) on governmental fiscal pressure. It provides an empirical basis for addressing Research Questions 2 and 3 (hereafter RQ) posed in Chapter One.

The main findings can be summarised into the following four points:

1. Subsidy models significantly impact fiscal pressure.

While the proportional subsidy model offers certain advantages in terms of fairness, its fiscal expenditures are highly influenced by economic indicators (such as per capita disposable income and pension levels). This leads to significant fluctuations in the subsidy-to-GPBR ratio, potentially resulting in unsustainable fiscal pressure, particularly against a backdrop of slowing economic growth. In contrast, the fixed-amount subsidy model offers more controllable expenditures and is more suitable for regions with a weaker fiscal base.

2. Fiscal sustainability exhibits clear hierarchical and regional disparities.

The same subsidy model imposes significantly different fiscal pressure across different administrative levels and regions. Expansion at the provincial and national levels can leverage economies of scale to smooth out localised fluctuations, yet fiscally weaker cities (e.g., Jingmen, Qianxinan) still face considerable pressure. This indicates that the sustainability of LTCI is highly dependent on local economic strength and the foundation of fiscal revenue.

3. Population structure and policy path dependency increase systemic complexity.

The eligibility criteria for subsidies are highly dependent on the type of basic medical insurance enrolment, resulting in the deep integration of the LTCI system with the existing social security framework. While this approach

facilitates rapid rollout, it may also solidify inequalities in coverage levels between regions and introduce long-term financial risks due to population ageing and changes in the structure of the insured population.

4. National rollout requires differentiated and dynamically adjusted strategies. The findings suggest that a single subsidy model is unsuitable for the fiscal realities of all regions. For the future nationwide expansion of LTCI, a subsidy strategy incorporating ‘categorised guidance and dynamic adjustment’ should be adopted, considering local fiscal capacity, demographic trends, and economic growth rates, to achieve a balance between fiscal sustainability and systemic fairness.

The quantitative analysis in this chapter lays an empirical foundation for the policy discussion in Chapter Eight, particularly providing key evidence for the comparison of subsidy models (Section 8.3) and the division of fiscal responsibilities across different levels of government (Section 8.4). Simultaneously, the conclusions of this chapter offer directional guidance for formulating the policy recommendations in Chapter Nine, aimed at addressing future demographic and economic uncertainties.

CHAPTER EIGHT: DISCUSSION

8.1 Overview

This discussion chapter synthesises the empirical findings from the structured comparative analysis (Chapter Six) and the fiscal sustainability projections (Chapter Seven) through the dual theoretical perspectives established in this thesis: policy diffusion theory and the framework of central-local government relations (央地关系).

Walker (1969) defined policy innovation as the initial adoption of a policy by a state, which may subsequently trigger further adoptions, a process described as policy diffusion. Rogers (1971) further conceptualised diffusion as the transfer, imitation, and adaptation of innovative policies among different actors within a social system, while Shipan and Volden (2006) identified four modes of diffusion: horizontal, bottom-up vertical, top-down vertical, and replication. In the Chinese context, scholars such as Wang and Lai (2013) and Zhou (2012) have argued that policy diffusion is characterised by hierarchical diffusion and absorption radiation diffusion, encompassing both top-down directives and bottom-up pilot innovations. Existing research on the diffusion of China's LTCI pilots has shown temporal and spatial patterns, as well as tensions between imitation and innovation (Zeng, 2021; Li and Kong, 2023).

In parallel, the perspective of central-local government relations provides a

framework for understanding the distinctive governance logic of China's social policy development. The central government frequently encourages local authorities to experiment with new policies, generating institutional experiences that may later be adopted nationwide (Zhu and Wu, 2018). The LTCI pilot programme exemplifies this 'experimentation under hierarchy' (Heilmann, 2008), in which central guidelines coexist with diverse local practices. While central authority sets the principles, objectives, and regulatory framework, local governments adapt these to their fiscal and institutional circumstances (Zhou et al., 2025). This interaction has produced both policy innovation and regional disparities, as local governments face fiscal pressures and sometimes resort to protectionist strategies (Chan and Shi, 2022; Zhou et al., 2025).

As deductively proposed in Chapter Four Theoretical Foundation, the integration of these frameworks enables this thesis to interpret the core patterns and tensions inherent in China's long-term care insurance (LTCI) institutionalisation. Specifically, it guides the examination of: (1) the regional variation and fragmentation resulting from central-local dynamics; (2) the divergent fiscal pressure of different subsidy models across administrative levels; and (3) the hybrid trajectory of top-down diffusion and bottom-up innovation.

This chapter is structured to directly address the research aims and questions

outlined in Chapter One. To recap, this thesis set out to: (1) examine the development of China's LTCI pilot system through a comparative review of its core dimensions (Aim1); (2) assess the fiscal sustainability of government subsidies when scaled to higher administrative levels (Aim2); and (3) evaluate different subsidy types and analyse the institutional development through central-local government relations and policy diffusion (Aim3). The corresponding research questions (RQs) focused on the evolution of pilot policies (RQ1), the conditions for fiscal sustainability (RQ2), the interaction of subsidy designs with governmental tiers (RQ3), and the role of central-local dynamics in institutionalisation (RQ4).

Building on the findings presented in the preceding empirical chapters, this discussion chapter is organised into four main sections to comprehensively respond to these inquiries. Section 8.2 delves into the institutional evolution of the LTCI pilots, aligning with RQ1 and Aim 1. It is mainly based on the findings from Chapter Six Structured Comparative Policy Review, providing an overview of institutional changes and achievements before critically examining the challenges and limitations across the four core dimensions: financing mechanisms, benefit design, disability assessment, and public-private partnerships (PPPs). The analysis of PPPs, given its under-explored nature, begins by outlining prevalent models before assessing their viability. Section 8.3 addresses the fiscal sustainability of government subsidies, speaking

directly to RQs2&3 and Aims2&3. It integrates the quantitative projections from Chapter Seven to discuss the implications of scaling up subsidised population, the fiscal pressure of different subsidy patterns (fixed-sum, proportional, mixed), and the varying fiscal capacities at municipal, provincial, and national levels. Section 8.4 synthesises central coordination, regional competition, local protectionism (as key dimensions of the central-local government relations perspective), and policy diffusion to directly answer RQ4 and the broader institutional aims of Aim3. It explores how the interplay of top-down directive and bottom-up experimentalism has shaped the system's development, thus revisiting and refining the core propositions advanced in Chapter Four. Finally, the chapter concludes by consolidating these insights, setting the stage for the policy recommendations and conclusions presented in Chapter Nine.

8.2 Evolution of China's LTCI Pilot Policies

8.2.1 Financing Mechanism

Institutional Changes and Achievements

The empirical analysis in Section 6.2 provides a clear foundation for understanding the institutional evolution of the LTCI financing mechanism. The following synthesis directly draws on the findings from the tables and discussion in that chapter. The evolution of financing resources for China's LTCI scheme demonstrates a progressive shift from reliance on single-channel funding towards institutionalised diversification. This overarching finding is derived from

the comparative analysis of pilot cities presented in Chapter Six. According to Section 6.2.1, in the initial pilot phase, many cities predominantly utilised the Basic Medical Insurance (BMI) fund, enabling rapid programme initiation with minimal pressure on employers and individuals but at the cost of straining on the sustainability of BMI. As pilots expanded, a greater number of cities introduced diversified models that combined BMI allocations with employer and individual contributions, local fiscal input, and supplementary resources from donations, welfare lotteries, and charitable funds. This diversification enhanced stability, resilience, and social engagement.

The data presented in Tables 9 and 10 of Chapter Six specifically show that in the second batch of pilots, diversification became more systematic: almost all cities incorporated employer, individual, and BMI contributions as core sources, while local government financing was more consistently institutionalised. Furthermore, participation from social and philanthropic funds expanded considerably, with cities such as Kunming and Gannan developing complex multi-source structures underpinned by both governmental leadership and social engagement. Comparatively, while some first-batch cities retained narrow funding channels even after expansion, the second batch achieved a higher degree of diversification, clearer fiscal responsibilities, and broader incorporation of social funds. The trajectory across the two cohorts reflects a national progression from 'insurance fund-led simplicity' to 'institutionalised

diversification', balancing rapid implementation with long-term sustainability through the combined involvement of government, market, and society.

Turning to financing methods, the data in Tables 11 and 12 of Chapter Six reveal that in parallel with the diversification of financing resources, the development of financing methods has exhibited a gradual movement from experimentation towards greater standardisation. Three principal approaches have emerged: fixed-amount financing, proportional financing, and mixed financing. The first batch of pilot cities displayed relatively balanced use of all three methods, with some local shifts during the expansion phase towards hybrid arrangements in response to administrative and distributive concerns. By contrast, the second batch was characterised by the predominance of fixed-amount financing, supplemented by proportional models and only limited application of mixed methods. This indicates a central tendency towards simplification and institutional consolidation, even as regional differentiation persisted: developed eastern and central cities favoured proportional financing to strengthen redistributive capacity, whereas western and fiscally constrained areas relied more heavily on fixed-amount models for stability and administrative control.

The analysis of funding standards and levels in Tables 13 and 14 further shows that the evolution of funding standards and levels within China's LTCI system reveals a gradual shift from uniform, low-level contributions to more structured

and differentiated arrangements. In the initial pilot phase, standards were deliberately modest, with flat-rate contributions set at a relatively low threshold to minimise resistance and ensure programme uptake. Such simplicity, however, often produced regressive effects, placing disproportionate pressure on lower-income groups. Subsequent reforms progressively raised funding levels, supported by a clearer definition of contribution bases and proportions. The introduction of income-linked contributions provided an ‘automatic adjustment mechanism’ (Dai, 2024), allowing funding standards to rise in line with wage growth and thereby enhancing both adequacy and fairness. Mixed models, combining flat and proportional elements, further reflected attempts to balance administrative feasibility with equity considerations, albeit at the cost of greater complexity.

From 2016 to 2020, average contribution levels increased markedly, underpinned by stronger fiscal commitment and institutional safeguards. At the same time, differentiated standards emerged: contributions began to vary by employment status, income group, and household type, with targeted subsidies introduced to protect disadvantaged populations. This dual trajectory of raising overall funding levels while embedding equity-sensitive differentiation marked a decisive transition from provisional, low-level experimentation to more sustainable and socially just designs.

Overall, the comparative analysis in Chapter Six (Section 6.2) demonstrates significant achievements in broadening financing sources, testing and consolidating financing methods, and progressively embedding equity considerations. These institutional advances, as evidenced in the policy documents from 29 pilot cities, laid the foundation for a more resilient and socially inclusive LTCI system.

Challenges and Limitations

While the empirical findings in Chapter Six demonstrate measurable institutional progress, they simultaneously reveal structural challenges that transcend mere operational shortcomings. This subsection moves beyond documenting these limitations to explore their broader implications. By critiquing these deep-seated issues, we situate the analysis from Chapters Six and Seven within a wider scholarly debate. This discussion not only accounts for the sustainability challenges of the financing mechanism but also generates additional insights into its future trajectory and potential evolution.

First, excessive dependence on the medical insurance framework. The heavy reliance on medical insurance transfers documented in Section 6.2.1 has created a fundamental structural vulnerability. Between 2016 and 2021, pilot regions cumulatively transferred RMB 67.4 billion from medical insurance funds, accounting for 82 per cent of LTCI revenue (Zhou et al., 2025). Such reliance

renders the scheme highly contingent upon the policy framework and fiscal capacity of the medical insurance system. It means that the sustainability of China's elderly care system is inextricably linked to the fortunes of its health insurance system, creating a precarious policy coupling. This challenges the ideal of building LTCI as an independent and robust pillar of the social security system, as deduced from the theoretical frameworks in Chapter Four. Regions with ample surpluses and strong fiscal capacity are able to provide higher levels of benefits and better-quality services, whereas resource-constrained areas offer limited entitlements and inadequate care provision (Zhou et al., 2025; Zhang, 2025). By the end of 2023, 20 pilot regions had not yet fully withdrawn transfers from medical insurance funds, although the overall scale of such transfers had diminished. This suggests that consensus has gradually formed around the 'social insurance + independent scheme'²⁰ model (社保长护险独立运行机制). However, significant variation exists in implementation, producing a fragmented landscape of experiences (Zhang, 2025). Moreover, financing arrangements differ across regions (some adopt fixed-amount, others proportional, or a hybrid of both (Xiang and Yang, 2025; Xie, 2025)), leading to substantial disparities in per capita financing levels, undermining equity and the pooling efficiency of the fund (Xiang and Yang, 2025).

²⁰ The 'social insurance + independent scheme' model (社保长护险独立运行机制) describes a LTCI system that is mandatory and provides broad coverage (reflecting its social insurance nature), but which features an independent and diversified financing mechanism.

Second, a financing dilemma. Beyond the structural issues evident in the Chapter Six, broader macroeconomic conditions present additional challenges. At the macroeconomic level, China presently faces weak consumer demand, difficulties in enterprise operations, pressures on employment and income, and strained local fiscal capacity. Under these conditions, introducing additional social insurance contributions may encounter a situation akin to “water without a source” (Zhang, 2025, p.26), that is, lacking a sustainable revenue base. Since 2018, the central government has persistently promoted tax and fee reduction policies, shifting enterprise pressure relief from a temporary to a permanent measure. The introduction of additional LTCI contributions at this juncture runs counter to the overarching principle of pressure reduction. Accordingly, scepticism has arisen in society, with some commentators questioning its untimely introduction, while certain pilot regions have progressed only slowly (Zhang, 2025).

The empirical data from Tables 9, 10, 13, and 14, identifies individual contributions as a key financing source, but broader analysis reveals implementation challenges. At the level of concrete financing, household contributions represent the weakest link, evidenced by low enrolment and contribution rates (Zhang, 2025; Wang, 2025). This faces three major obstacles:

1. Limited contribution capacity. In 2023, the average annual wages of employees in urban non-private and private enterprises were RMB 121,000

and RMB 68,000 respectively, while the per capita disposable income of urban and rural residents stood at only RMB 52,000 and RMB 22,000. The large disparities between urban and rural populations and across groups severely constrain contribution capacity (Zhang, 2025).

2. Low willingness to contribute. Unlike employees whose contributions are deducted automatically by employers, urban and rural residents are required to pay voluntarily, which intensifies the sense of deprivation (Zhang, 2025). For instance, the minimum contribution for residents' medical insurance has risen from RMB 10 to RMB 400 within less than 20 years (a forty-fold increase) (Zhang, 2025). In comparison with Basic Medical Insurance, which is universally required, LTCI risk is concentrated primarily in advanced old age, leading to low willingness to enrol among healthy and younger cohorts, and thus creating pronounced adverse selection.
3. Wide disparities in fiscal subsidies. In 2023, residents' medical insurance revenues amounted to about RMB 1.06 trillion, of which fiscal subsidies reached RMB 652.97 billion, accounting for 62 per cent (Zhang, 2025). Yet local fiscal capacities vary greatly: the highest and lowest provinces differ ninefold in per capita fiscal revenue, with even greater disparities at municipal and county levels, severely restricting the expansion of LTCI (Zhang, 2025).

Collectively, these three obstacles (capacity, willingness, and disparity) are not merely a list of implementation challenges. They represent a profound equity-efficiency trade-off inherent in voluntary contribution models. The quantitative disparities in fiscal capacity (point 3) directly translate into the regional variations in benefit levels that were qualitatively documented in Chapter Six (Section 6.3), creating a self-reinforcing cycle of inequality. This implies that a system overly reliant on individual contributions and local fiscal subsidies is likely to institutionalise, rather than mitigate, existing regional and urban-rural disparities.

Third, structural shortcomings. The core structural issue identified in the analysis is the inherent weakness of the financing foundation. Although low contribution rates reduce pressure on households, they result in inadequate financing and limited benefit levels. Diversified channels remain unstable because donations and charitable funding are highly sensitive to the external environment and are thus incapable of providing long-term sustainable support. These weaknesses, together with the reliance on medical insurance already discussed above, highlight the need for a more independent and sustainable financing mechanism.

This is not about criticising isolated problems, but about pointing out that they

all stem from the same underlying cause. Issues such as ‘low contribution rates’, ‘unstable funding channels’, and ‘over-reliance on medical insurance’ are in fact symptoms of a broader structural weakness. The root of the matter lies in the original policy choice: the government prioritised getting pilot schemes up and running quickly and avoiding resistance, rather than placing fiscal sustainability and institutional independence at the forefront.

These problems not only reflect implementation difficulties at the local level but also highlight the absence of a national legal framework (Mu and Rong, 2025). As shown in the differences in ‘policy document numbers’ among the pilot regions in Chapter Six (Tables 9 to 14), the absence of such a high-level framework directly leads to the fragmentation of local policies. To date, most LTCI-related documents take the form of ‘opinions’ or ‘notices’ of a recommendatory nature, lacking binding legal authority or operational guidance. Local policy implementation has therefore tended towards mechanical replication with limited innovation (Zheng, 2021). The call for a national legal framework is thus often presented in the literature as a solution to policy fragmentation (Mu and Rong, 2025). Only a legal mandate can empower the government to standardise and eventually raise contribution rates to adequate levels, and to create a truly independent fund that breaks the dependency on medical insurance.

Fourth, limited societal awareness and participation. Moving beyond the empirical findings of Chapter Six, social factors present additional challenges. LTCI has been described as ‘the sixth social insurance’²¹, yet its social foundation remains comparatively weak (Su and Wang, 2025). On the one hand, public awareness is limited: for example, a survey in Nanjing revealed that 83 per cent of older residents had no knowledge of LTCI, and 67.3 per cent were unwilling to enrol (Zhang et al., 2018b). This low willingness is not simply a lack of understanding; it is a rational response from younger and healthier cohorts who face high existing social insurance pressure and perceive the risk of long-term care (LTC) as distant. This creates a classic case of adverse selection that threatens the very actuarial logic of the insurance pool. On the other hand, the aggregate social insurance contribution rate is already high, placing a heavy pressure on enterprises and crowding out fiscal space for LTCI financing (Han, 2010b). This high overall contribution rate indicates that there is very limited room, both politically and economically, to renegotiate the ‘social contract’ around LTCI. Consequently, introducing LTCI is not simply adding a new insurance system. It entails making difficult political choices within tightly constrained fiscal resources. Moreover, an independent LTCI fund has yet to be established, raising concerns about long-term sustainability (Cousins, 2025).

²¹ China's Five Social Insurances (五险) mandate employer-employee contributions to pension, medical, unemployment, work injury, and maternity insurance schemes, with maternity coverage now typically integrated into medical insurance (post-2019 reform).

Ultimately, the question of whether society can engage broadly is one of legitimacy. For LTCI to become firmly established, it cannot remain a purely technocratic design. Instead, it must evolve into a widely accepted pillar of the welfare state. This cannot be achieved through publicity campaigns alone but requires sustained public debate. Such a debate must clearly explain why sharing the risks of LTC benefits everyone, and it must build consensus that such benefits justify the associated costs. This is a complex political and social process. While this thesis can identify this challenge, it cannot resolve it. Achieving resolution demands wider public deliberation and strong political leadership.

In sum, the LTCI pilots have reduced the care pressure on families and provided valuable institutional experience, but challenges remain: (1) over-reliance on medical insurance; (2) insufficient and uneven household contributions; (3) heavy fiscal pressure, lack of a legal framework; and (4) weak social foundations. Addressing these issues is essential for the sustainable and equitable development of the system. Detailed policy recommendations will be presented in Chapter Nine.

8.2.2 Benefit Design

Institutional Changes and Achievements

During the pilot phase of China's LTCI system, both the scope of the insured

population and the range of beneficiaries evolved from exploratory trials towards gradual institutionalisation, as empirically detailed in Section 6.3. Initially, the scheme relied primarily on the basic medical insurance system, especially participants in the Urban Employee Basic Medical Insurance (UEBMI), while some regions also included those covered by the Urban-Rural Resident Basic Medical Insurance (RBMI). As policies matured, several pilot cities extended coverage to all medical insurance participants, and by the end of 2023, all 49 pilot cities had enrolled 183 million participants, of whom 1.34 million received benefits, thus establishing the basic framework of the scheme (Zhang, 2025).

Beneficiaries also expanded from narrow to more diversified groups. As Section 6.3.1 demonstrated, the first batch of pilot cities showed a significant evolution between 2016 and 2020, with the trend moving towards broader coverage and more detailed standards. The scope of benefit recipients expanded from solely severely disabled individuals to include multiple disability levels, specific high-age groups, and special disease categories. Initially, most localities targeted individuals with severe disabilities as the core recipients. With practice, some cities gradually extended coverage to persons with moderate disabilities, specific disease groups (such as patients with advanced dementia), and the oldest old. This reflects a multi-layered expansion of beneficiary groups.

Benefit design has consistently adhered to three guiding principles: overall budgetary control with categorical guidance, moderate protection, and targeted support for disadvantaged groups. Since the inception of pilots, reforms in benefit limits and benefit levels have centred on expanding coverage, diversifying payment methods, refining differentiated standards, and establishing mechanisms for sustainability. The evolution detailed in Tables 17 and 18 shows that at the launch of the first batch in 2016, most cities confined services to institutional and home-based care, with payment ceilings typically set as a daily flat rate. By the expansion stage in 2020, benefits included community day care, subsidies for assistive devices, rehabilitation services, and palliative care. Payment ceilings evolved from the single 'per diem' model to monthly, hourly, and service-specific pricing structures, realising a transformation from a binary 'institution-home' framework to a more integrated 'institution-home-community-medical' system.

Reimbursement levels evolved from an initially broad guideline of 70 per cent, as stipulated in the early national policy document (*No.80 document*), to more finely differentiated standards based on service type (institutional versus home care), disability level (moderate versus severe), and insurance status (employees versus residents). Tables 17 and 18 shows that by 2020, linking disability grading assessments with payment standards had become common, with higher levels of disability entitling enrolees to greater service frequency,

longer duration, and higher subsidies. Priority groups such as the oldest old, those with severe disabilities, and low-income households were granted preferential reimbursement, reflecting a balance between equity and efficiency. Around 30 per cent of pilot cities have introduced cash allowances alongside service subsidies, assessed and monitored by professional agencies to reduce over-reporting of disability and moral hazard and improve the efficiency of fund utilisation (Peng and Ai, 2024; Liu, 2025).

Beyond the analysis of policy documents presented in Chapter Six, the purchasing function of the LTCI fund has stimulated the care services industry. By 2023, there were over 7,600 contracted providers and 330,000 care workers nationwide (five times and ten times, respectively, the numbers in 2017), marking a notable increase in professionalisation (National Medical Insurance Administration, 2023; Wang, 2025).

Compared with the first cohort of pilot cities, which progressed from low-level, uniform arrangements to diversified benefits, the second cohort introduced more flexible designs, finer differentiation, and dynamic adjustment mechanisms. These advances not only enhanced adequacy and equity but also provided sustainable and replicable institutional experience for nationwide implementation.

Challenges and Limitations

While the synthesis above outlines the institutional progress directly observed from the pilot policies, a broader analysis reveals several systemic challenges that these findings imply for future national policy:

1. Limited coverage and equity gaps.

Although enrolment has grown, precision and fairness remain limited. Most pilots focus on urban employees, with insufficient inclusion of urban-rural residents, particularly those in rural or remote areas, leaving nearly half of the potentially eligible population outside the scheme (Liu, 2025; Sun, 2021). This undermines risk pooling (the law of large numbers) (Mu and Rong, 2025), exacerbates urban-rural welfare disparities, and raises concerns about social equity and stability. Provision for people with mild or moderate disability is inadequate, neglecting rehabilitation and preventive functions, which may worsen health outcomes and family pressure (Mu and Rong, 2025). Regional discrepancies also constrain population mobility: for example, an older person with mild disability who has paid into LTCL in Shanghai may lose eligibility when relocating to Tianjin, where only severely disabled residents are covered (Mu and Rong, 2025).

2. Significant variation in benefit levels.

Benefit generosity varies widely across regions, with higher reimbursement

levels in the eastern provinces compared to central and western areas (Xue and Zhang, 2024). Because contribution rates differ, employees covered under the employee insurance scheme generally receive more generous benefits than those enrolled in the resident scheme (Liu, 2025). Some cities (e.g. Chengdu, Guangzhou) differentiate contribution and benefit levels by age group. However, the absence of a unified disability assessment standard distorts fairness (Liu, 2025). The boundary between LTC and medical services also remains unclear, leading to great variation: medical care items range from 5 to 47, and daily living services from 10 to 52 across pilot sites (Zhang, 2025). Strict eligibility conditions further limit accessibility. Some pilots require more than six months of disability, a three-month waiting period, or even means-testing (Su and Wang, 2025). Consequently, the proportion of disabled beneficiaries ranges from as low as 0.16 per cent to a maximum of 2.52 per cent (Liu, 2025). This combination of 'strict conditions but generous benefits' both undermines equity and increases moral hazard, weakening fiscal sustainability (Su and Wang, 2025). The benefit levels and reimbursement rates in Chapter Six documented an overall trend towards more refined and tiered rates alongside significant local divergence, provides the foundational evidence for this critique of variation and its implications.

3. Insufficient innovation in benefit models.

Internationally, mixed models combining cash and service benefits are common,

as they allow beneficiaries to choose between receiving direct cash payments to arrange care independently or accessing subsidised services, thereby enhancing individual autonomy and better meeting diverse care needs (Zhang et al., 2023; Ren and Li, 2020). By contrast, most Chinese pilots remain centred on service subsidies, continuing the logic of medical insurance reimbursement (Zhou et al., 2025). Such path dependence reduces beneficiary autonomy and constrains institutional innovation (Zhou et al., 2025).

4. Service provision remains narrow and fragmented.

This limitation is not explicitly apparent from a comparative analysis of pilot policy documents (Section 6.3) but has manifested clearly in practical implementation. Current services focus predominantly on basic daily living support, with limited provision of medical and nursing care (Su and Wang, 2025). Care plans are typically designed by community-based care stations (local service points established to provide basic nursing and support under the LTCI pilots) which often avoid incorporating medical services to reduce costs and liability. Surveys indicate that the frequency and duration of medical care are insufficient to meet older people's needs (Su and Wang, 2025). Mismatches are common, with care workers providing domestic services (e.g. laundry, cleaning) rather than clinical or rehabilitative support (Su and Wang, 2025). Services such as rehabilitation, meal delivery, and equipment rental are often unavailable, leaving diverse needs unmet (Liu, 2025). At the same time, regional pilots

emphasise different priorities – e.g. Shandong highlights the integration of medical and social care, requiring providers to hold medical licences, while Jilin focuses on institutional care, with limited home-based services (Zhang, 2025). Such policy fragmentation weakens the replicability and scalability of pilot experiences. The documented diversification of service types in the expansion phase is a positive step, but this broader critique highlights the gap between policy intent and practical implementation.

5. Workforce shortages and supply-demand imbalance.

Like the issue noted in Point 4, this challenge is not evident in the policy review of Chapter Six but is consistently highlighted in empirical academic research on LTCI benefit design. This systemic bottleneck threatens to undermine the operational viability of even the most well-designed LTCI benefits. In 2024, China had only 500,000 eldercare workers, compared to a shortfall of 5.5 million (Yang and Chen, 2024). Even if the ‘14th Five-Year Plan’ target of two million workers was achieved, the carer-to-disabled-elder ratio would remain 1:22.5, far above the ideal 1:4 (MCA, 2022). This shortage directly impacts the pilot's goal of stimulating the care market. Without an adequate workforce, the documented expansion in contracted providers cannot translate into actual service delivery for beneficiaries. Resources are concentrated in the eastern provinces and cities, leaving western and rural areas underserved, creating a paradox of both ‘vacant beds’ and ‘shortages of beds’ (Xiang and Yang, 2025)

that exacerbates the regional disparities observed in the pilot programs. Low pay, limited career progression, and lack of professional training outside hospitals contribute to staff attrition and constrain service quality (Xie, 2025), posing a fundamental constraint on the sustainability of the entire LTCI system.

6. Marked urban-rural and regional disparities.

Although the policy review in Section 6.3 suggests an overall trend of expanding coverage and diversifying care models when looking at the pilots in aggregate, the reality of implementation varies significantly from city to city. LTC services are highly concentrated in urban and eastern areas, while rural and less developed regions face severe undersupply (Cousins, 2025). Average occupancy rates in institutions are only 60 per cent, with nearly 80 per cent of residents being self-sufficient, meaning effective utilisation is just 12 per cent (Cousins, 2025). Meanwhile, home- and community-based services (HCBS) lag behind. While major cities have developed community stations, day-care centres, and home-based services (Li et al., 2024), rural areas struggle due to limited resources and dispersed populations. The pilot findings primarily reflect developments in urban settings; this broader disparity highlights a significant limitation in the generalisability of the current pilot model for nationwide rollout.

Academic literature attributes these institutional shortcomings to several underlying factors: limitations in scheme design that focus narrowly on severe

disability while neglecting prevention, fiscal disparities that constrain local financing capacity, persistent shortages and low professionalisation of the care workforce, policy fragmentation across pilot regions, and the concentration of resources in urban areas at the expense of rural and remote communities (Mu and Rong, 2025; Su and Wang, 2025; Xiang and Yang, 2025; Zhang, 2025; Cousins, 2025; Li et al., 2024).

In sum, while the pilots have broadened benefit models and improved service delivery, persistent challenges remain in terms of coverage, equity, service quality, and regional balance. These limitations highlight the need for unified national standards, stronger institutional design, and a more sustainable care workforce to ensure the long-term viability of the system.

8.2.3 Disability Assessment

Institutional Changes and Achievements

China's LTCI pilots have gradually developed disability assessment mechanisms, moving from fragmented and rudimentary practices to unified and standardised procedures. Initially, most cities relied on activities of daily living (ADL, primarily the Barthel Index), supplemented in some cases by tools such as MMSE, KPS, or localised scales (e.g. *Shanghai's Comprehensive Ability*

*Assessment for the Elderly*²²), reflecting a pluralistic and exploratory approach. As discussed in Section 6.4, these early tools varied significantly across cities, leading to heterogeneous eligibility thresholds (e.g. Barthel cut-offs at 40 vs 60). At this stage, assessments primarily targeted severely disabled populations and were usually conducted by medical expert teams organised by health insurance departments. Although highly professional, these arrangements often suffered from inefficiency and the dispersion of resources.

With the expansion of pilot programmes and the maturation of policy, the system gradually introduced third-party assessment agencies, commercial insurers, and labour capacity appraisal institutions, creating a more diversified structure that enhanced objectivity and market orientation. As discussed in Chapter Six, this diversification was particularly evident in the first batch of pilot cities, where third-party institutions and insurance companies were more prominent, while the second batch of pilot cities relied more on expert teams. Yet regulatory and incentive frameworks across institutions remained underdeveloped, giving rise to practical challenges such as inefficiency and inadequate provision. To address these issues, in 2021 the National Healthcare Security Administration, together with the Ministry of Civil Affairs, issued the *National Disability Assessment Criteria for Long-Term Care (Trial)*. This national

²² Notice of the General Office of the Shanghai Municipal People's Government on Printing and Distributing the Revised 'Measures for the Unified Demand Assessment and Service Management of Elderly Care in Shanghai' [2022] No.17

standard, as summarised in Chapter Six, this framework, for the first time, established a nationwide standard, specifying 17 indicators across three dimensions (ADL, cognitive function, and perception and communication) and classifying disability into six levels (0–5). It further clarified that individuals with moderate to severe disability constitute the principal beneficiaries. This institutional reform signalled a decisive shift from fragmented local experimentation to nationwide unification, and from experiential and diverse practices towards formalisation and standardisation.

At the implementation level, the first group of pilot cities displayed stronger tendencies towards diversification and marketisation, with increased participation from third-party agencies and commercial insurers. By contrast, the second group of pilot cities relied more heavily on medical expert teams, emphasising clinical expertise and professional accuracy. These patterns, as shown in Chapter Six (Tables 19 and 20), reflect the differing institutional orientations at distinct stages: the former prioritised the exploration of pluralistic pathways and the cultivation of market mechanisms, whereas the latter highlighted professionalisation and institutional convergence. Overall, the trajectory of China's LTCI disability assessment illustrates a reform logic that moves from local experimentation to national unification, from reliance on a single tool to the adoption of composite indicators, and from administrative dominance to multi-stakeholder participation. Its core objective lies in balancing

equity, scientific rigour, and sustainability, thereby providing a replicable institutional model for nationwide implementation.

Challenges and Limitations

Despite these advances, disability assessment in China's LTCI pilots faces persistent challenges.

First, fragmentation and insufficient scientific rigor in assessment standards. As discussed in Chapter Six, despite the 2021 standard, many cities continue to rely on older tools such as Barthel or Katz indices, leading to inconsistency. Disability assessment is the precondition for individuals to access LTCI benefits. Scholars have characterised disability assessment as the “gatekeeper” (看门人) of the LTCI system (Dai, 2024, p.40), the “precise measure” (试金石) of its fairness and justice (Zhang, 2025, p.27), and the “safety valve” (安全阀) for ensuring its sustainable operation (Zhang, 2025, p.27), while the delivery of care services is regarded as the “core axis” (轴心) of the system and the “measuring instrument” (度量衡) through which its effectiveness is realised (Zhang, 2025, p.27). Yet in practice, assessment criteria remain fragmented and lack robust scientific grounding (Li et al., 2024; Liu, 2025). Most pilot cities draw on either the *Ministry of Civil Affairs’ Assessment of Older Adults’ Functional Capacity* or the Barthel Index, emphasising activities of daily living, mental state, sensory and communication ability, and social participation (Liu,

2025; Xie, 2025). These frameworks, however, tend to prioritise functional capacity and fail to provide a systematic evaluation of LTC needs, thereby inadequately reflecting the lived realities of older adults with disabilities (Liu, 2025).

This observation extends beyond the empirical findings. While Chapter Six presented heterogeneity in assessment practice, here this section draws on wider scholarship to highlight systemic risks of inequity and moral hazard. More critically, existing tools are often overly simplistic or insufficiently nuanced in terms of indicator design and grading. Standards vary across regions, leading to substantial disparities in LTCI entitlements: two older adults with comparable disabilities may receive markedly different benefits depending on the local tool employed (Zhu et al., 2019). In addition, some indicators are highly subjective, making assessment results dependent on the assessor's professional competence and sense of responsibility. In certain regions, instances of deliberate over-reporting of disability levels have emerged, creating moral hazard and adverse selection (Liu, 2025).

Second, institutional deficiencies in assessment bodies and regulatory mechanisms. Section 6.4 highlighted differences in institutional participation. Building on that, here this section notes broader critiques raised in the literature, namely that the role and governance of designated assessment agencies

remain underdeveloped (Su and Wang, 2025). Many so-called ‘third-party’ agencies rely heavily on government subsidies and lack sustainable, independent funding sources, rendering their long-term viability uncertain (Su and Wang, 2025). Entry thresholds for assessment agencies are relatively low; staffing and infrastructure are inadequate, and training and supervision of assessors remain underdeveloped (Li et al., 2023). Consequently, assessment quality is uneven. For example, some assessors complete evaluations in little more than ten minutes, despite guidelines suggesting the process should take around an hour (Su and Wang, 2025).

Moreover, the shortcomings of the task allocation mechanism have also given rise to two extremes: some assessors face excessive workloads that lead to fatigue and declining assessment quality, while others, though formally accredited and included on official lists, have long lacked practical opportunities to conduct evaluations (Su and Wang, 2025). These workforce-related challenges were not central to Chapter Six’s empirical analysis, but they represent an important contextual factor for interpreting the sustainability of the system. Moreover, assessors come from diverse institutional backgrounds (some are affiliated with community health service centres, while others are drawn from the civil affairs system), yet their organisational affiliation and boundaries of responsibility remain ambiguous. This situation not only generates administrative confusion but also undermines the objectivity and

credibility of assessment outcomes (Jiang et al., 2019; Zhang et al., 2022c).

Third, insufficient cross-sectoral coordination and information sharing. The implementation of LTCI involves multiple government departments, including healthcare security, civil affairs, and public health. In practice, however, differences in the understanding of policy objectives and jurisdictional boundaries reduce the efficiency of interdepartmental collaboration. This challenge was less visible in Chapter Six's municipal comparison but emerges strongly in secondary literature, and has led to departmentalised management and policy fragmentation (Xiang and Yang, 2025; Sun et al., 2024). For example, the eligibility criteria for civil affairs' care subsidies and those for LTCI benefits are not harmonised, and disability assessments are seldom mutually recognised across departments (Xiang and Yang, 2025). As a result, older adults may be subjected to multiple, overlapping assessments, leading to redundancy and inefficiency (Xiang and Yang, 2025). At present, there are no clear regulations as to whether basic elderly care subsidies, allowances for older people living in poverty, and subsidies for those with severe disabilities can be received concurrently (Yuan, 2024).

Information-sharing is similarly problematic. Current medical and care information systems are poorly integrated, creating data silos that hinder the seamless coordination of medical and care services. While Section 6.4 focused

primarily on institutional arrangements and assessment tools, here this section broaden the lens to consider data governance and system integration as highlighted by recent policy analyses. This, in turn, limits LTCI's ability to alleviate the pressure on healthcare resources (Su and Wang, 2025). For example, LTCI intends to provide financial support for priority groups, namely older adults who are genuinely in a state of long-term disability and require continuous care (Su and Wang, 2025). However, among those currently assessed as disabled under the scheme, a considerable proportion exhibit only mild impairments and have limited need for LTC (Su and Wang, 2025). This makes it difficult to implement effective home-based management (Su and Wang, 2025). Moreover, the existing electronic health records are inadequate, resulting in restricted access to medical information and a lack of objective data to accurately reflect the true health status of older individuals (Su and Wang, 2025).

In summary, the issue of a trial assessment standard (Health Insurance Bureau Office and Ministry of Civil Affairs Office, 2021) marked important step towards consolidation. As Section 6.4 has shown, much progress has been made in institutional design and tool development, but the broader challenges identified here draw on secondary literature and point to systemic barriers that extend beyond the empirical scope of this thesis. The fragmented standards, underdeveloped institutions, weak coordination, and inadequate data-sharing

continue to undermine equity and sustainability, posing risks to the long-term effectiveness of the LTCI system.

8.2.4 Public-Private Partnerships (PPPs)

International research on public–private relationships highlights that PPPs are not merely contractual or administrative tools but hybrid governance arrangements whose performance critically depends on information structures, incentive alignment, and risk allocation between actors (de Vruh et al., 2019).

In welfare sectors such as healthcare and LTC, PPPs operate in what scholars term ‘high contract incompleteness’ environments, where service processes are difficult to standardise, outputs are not easily measurable, and public authorities lack the ability to observe private actors’ behaviour, thereby intensifying information asymmetry and moral hazard risks (Joudyian et al., 2021). LTC presents an even more challenging terrain: its relational and labour-intensive nature means that key ‘soft information’ about needs, quality, and appropriateness of care is often held by families, communities, and frontline workers rather than by insurers or government agencies, producing what East Asian LTC scholars identify as structural quasi-market failures when private actors are expected to deliver relational services through market logics (Tian and Mok, 2025). As PPPs in health and care have evolved from bilateral to increasingly multilateral arrangements involving insurers, assessment agencies, community organisations, and IT providers, the complexity of incentives and

governance interfaces has grown, magnifying coordination challenges and the potential divergence between public goals and private incentives (de Vruet et al., 2019).

Against this theoretical background, the diverse PPP models emerging across China's LTCI pilots can be understood not only as administrative experiments but as institutional responses to core governance dilemmas identified in the international literature, namely how governments seek to harness private-sector capacity while mitigating information asymmetry, preventing moral hazard, and retaining ultimate responsibility for the fairness and sustainability of LTC provision. With this conceptual foundation in place, the next part of this chapter unpacks how Chinese LTCI pilots operationalised PPP arrangements, revealing how theory meets practice in the everyday architecture of assessment, service delivery, and insurance administration.

Existing Models of Public-Private Partnerships in China's LTCI Pilots

This subsection builds upon and extends the empirical foundation established in Chapter Six (Section 6.5), offering a more in-depth exploration and literature-informed discussion of the diverse PPP models adopted across pilot cities. In the development of China's LTCI system, PPPs have followed a phased trajectory across the first batch of pilots launched in 2016 and the second batch initiated in 2020. As detailed in Section 6.5, the 2016 pilots' local governments

typically introduced insurers into the administration of LTCI through full-process delegation, covering policy promotion, benefit application, disability assessment, claims review and payment, record management, and information system development. In cities categorised under the ‘government entrusts + commercial insurance companies agent’ model, insurers were entrusted not only with general administration but also with the tasks of fee review and payment settlement (as classified in Table 21). In the non-pilot, Haidian District of Beijing, by contrast, virtually all fund operation and management responsibilities were devolved to commercial insurers, marking the emergence of the ‘government provides subsidy + commercial insurance companies operate model’ (see ‘Other’ in Table 21). Meanwhile, cities such as Shihezi and Guangzhou outsourced only non-financial tasks (such as disability assessment and IT system development), falling within the ‘government purchasing + commercial insurance companies service model’. Overall, the first batch of pilots was characterised by a more circumscribed scope of outsourcing, with most insurers having an intermediate level of involvement, reflecting its exploratory orientation towards building market mechanisms.

By 2020, the introduction of the second batch of pilots signalled a phase of institutional refinement for the PPPs. This refinement was evidenced by a recalibration of roles: although Table 22 shows more ‘intermediate involvement’, it reflected a more targeted and streamlined set of responsibilities. Compared

with the second batch, the first batch entrusted insurers with a narrower range of responsibilities, focusing mainly on basic service functions such as policy publicity, agreement signing and management, and personnel training and capacity building, while their role in fee review and payment settlement was reduced. This shift reflects a recalibration of governance priorities: the second batch emphasised broad delegation to encourage market participation, whereas the first batch prioritised professionalisation and stricter administrative control, with a clear focus on safeguarding fund security. The comparative evidence from Section 6.5 underscores a systemic progression from centred on functional specialisation and risk control to exploratory, marked by wide coverage and deep involvement.

The differences among the three models are indeed concentrated in fund management and institutional design (Lu, 2021). Drawing on the functional analysis in Section 6.5, in the ‘government purchasing + commercial insurance companies service model’, commercial insurers hold the lowest level of authority, being limited to administrative services (such as application processing, information system development, and policy dissemination) as well as eligibility assessment. They do not participate in fund management, fund collection, or institutional design. In the ‘government entrusts + commercial insurance companies agent model’, the authority of commercial insurers is somewhat expanded. In addition to administrative services and eligibility

assessment, they may also be involved in fund management, benefit disbursement, and operational services. However, fund collection generally remains with the medical insurance or fiscal authorities, and insurers are not directly responsible for this function. In the ‘government provides subsidy + commercial insurance companies operate model’, commercial insurers hold the highest level of authority, effectively covering the entire process. Beyond administrative services and eligibility assessment, they also undertake fund collection, fund management (including investment operations), institutional design, and other operational services. The operational logic is thereby closer to that of pure commercial insurance, with the distinction that government provides financial subsidies. The operation mechanisms of three PPPs are as follows. They are based on synthesis of literature and the CLIP (2023) database, and are presented as integrations of the structural findings derived from the policy analysis in Chapter Six.

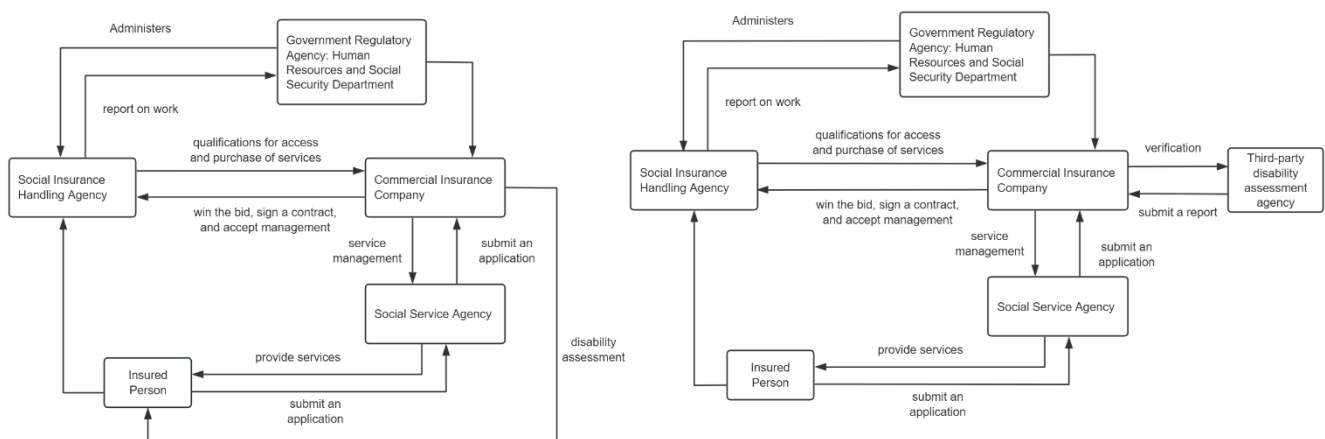


Figure 30 Operation mechanism of the ‘government purchasing + commercial insurance companies service model’ (author’s compilation based on CLIP (2023) policy documents)

In the 'government purchasing + commercial insurance companies service model', local governments, through open tendering, delegate part of the administrative and managerial functions to the successful commercial insurance providers, such as the acceptance of applications for LTC eligibility assessment (Lu, 2021). Owing to variation in the responsible authority for eligibility determination, this institutional design gives rise to two operational pathways (Figure 30): (1) eligibility assessment undertaken directly by the commercial insurer; or (2) eligibility assessment delegated to government agencies or non-governmental organisations.

Government regulatory authorities exercise oversight over the administrative agency. Under the guidance of these authorities, the administrative agency establishes qualification criteria for market entry, conducts public tendering for commercial insurers, and reports progress to the supervising government body (Lu, 2021). Following the conclusion of the bidding process, the administrative agency enters into a contract with the selected insurer, stipulating the rights and obligations of both parties (Lu, 2021). The administrative agency assumes primary supervisory responsibility, rectifying problems identified during implementation and reporting them to the government authority (Lu, 2021).

The contracted commercial insurer undertakes administrative management tasks, including processing and verifying applications for eligibility assessment,

implementing cost-containment and audit procedures, developing operational guidelines, and constructing information systems (Lu, 2021). By contrast, fund management functions remain the responsibility of the government authority.

Specifically with regard to the eligibility assessment process, two distinct pathways emerge depending on the nature of the assessing body (Lu, 2021). The first involves the commercial insurer conducting the assessment in-house, producing an eligibility report and, upon approval, granting the insured access to LTC services. The second involves the insurer commissioning a third-party body (either a government agency or a social organisation) to carry out the assessment. The assessment report is then returned to the insurer for verification, and applicants who pass this review become legally entitled to LTC services.

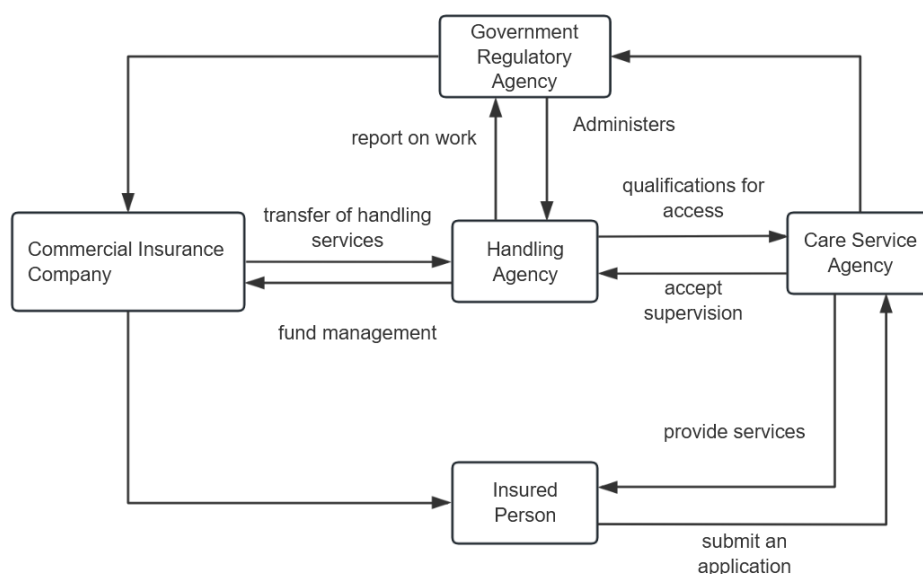


Figure 31 Operation mechanism of the ‘government entrusts + commercial insurance companies agent model’ (author’s compilation based on CLIP (2023) policy documents)

In the 'government entrusts + commercial insurance companies agent model', commercial insurers are more deeply embedded, most notably through their partial involvement in fund management. This model essentially engages four principal actors: the government regulatory authority at the apex of institutional design, the social insurance administrative agencies, the commercial insurance companies, and the LTC service providers. The operational mechanism is illustrated in Figure 31.

The government regulatory authority occupies the top tier of the institutional framework, exercising direct responsibility for the day-to-day administrative supervision of both the administrative agencies and the care service providers (Zhong and Cheng, 2018). Municipal and district-level social insurance administrative agencies are tasked with selecting accredited care providers within their jurisdictions, contracting with them, and exercising statutory oversight (Zhong and Cheng, 2018).

Within this model, commercial insurers assume a broader set of functions compared with the government-purchasing service model (Zhong and Cheng, 2018). In addition to the administrative responsibilities they already hold in that model (such as application processing, eligibility verification, cost control, and information system development) commercial insurers here also participate in

fund management. Although the fund management function was not explicitly outlined in the policy documents analysed in Chapter Six, scholarly research on the pilot operations has identified its presence in practice (Zhong and Cheng, 2018; Lu, 2021). Commercial insurance companies jointly undertake LTCI administration in collaboration with the social insurance agencies. Care service providers, in turn, are responsible for delivering LTC services to insured persons who have successfully passed the eligibility assessment (Zhong and Cheng, 2018).

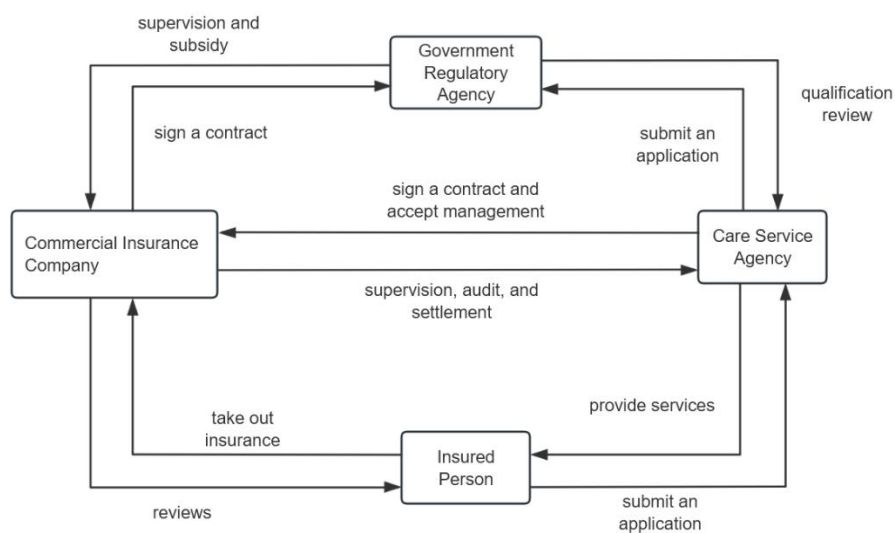


Figure 32 Operation mechanism of the ‘government provides subsidy + commercial insurance companies operate model’ (author’s compilation based on CLIP (2023) policy documents)

The ‘government provides subsidy + commercial insurance companies operate model’ is particularly distinctive and, in the strict sense, constitutes a form of commercial insurance, with commercial insurers undertaking all core functions. To date, this model has only been piloted in Haidian District of Beijing. Although

the relevant policy documents (The People's Government of Haidian District, 2016) remain valid on the official website of the Beijing Municipal People's Government, attention has shifted from Haidian to Shijingshan since the latter was designated as a second-batch pilot in 2020, as Haidian has not undertaken any policy updates or reforms. Given the short duration of implementation, its outcomes remain inconclusive, and it is not yet possible to assess its success or failure (Yang et al., 2018). Nevertheless, as local governments still exercise a limited role within the scheme, and because the model offers useful insights for advancing pilot initiatives, it is considered one of the institutional forms of state-market collaboration in LTCI.

In this model, commercial insurers occupy a dominant position and play a pivotal role, with the operational mechanism illustrated in Figure 32. In contrast to the preceding two models, commercial insurers assume responsibility for virtually the entire spectrum of LTCI functions (Peng, 2022; Zhang et al., 2018a). These not only encompass service provision management, administrative operations, and contribution collection (functions generally undertaken in the other models) but also extend to the direct investment and financial management of the LTCI fund (Peng, 2022; Zhang et al., 2018a). By comparison, the authority of government regulatory agencies is reduced to a minimum, confined largely to the preliminary accreditation and routine supervision of commercial insurers and care service providers, while providing

subsidies in proportion to the age cohorts of insured participants (Peng, 2022; Zhang et al., 2018a).

Comparative Advantages of PPPs in LTCI

This subsection expands the discussion by placing the empirical findings from Chapter Six within a broader context, drawing on additional literature to critique performance, highlight wider issues, and explore future implications.

1. Comparative Analysis

Building on the functional classification established in Chapter Six (Tables 21 and 22), the three models of PPP in LTCI essentially transfer certain administrative functions from the state to commercial insurance companies. However, differences in institutional design and specific operational mechanisms result in divergent performance outcomes (see Table 49). Table 49, adapted from Lu (2021), provides a comparative framework that extends the empirical findings of this thesis by evaluating the operational effects of the models identified in Section 6.5.

Table 49 Comparison of the operational effects of the three models (Lu, 2021)

PPP Models	Administrative Efficiency	Coverage Rate and Benefit Level	Risk Management	Incentive Mechanism	Disability Assessment
Government purchasing + commercial insurance companies service model	Improved	Relatively high coverage rate; Moderate benefit level	Strong	Weakest	Tendency towards lenient assessment
Government entrusts + commercial insurance companies agent model	Improved	Relatively high coverage rate; Moderate benefit level	Relatively strong	Strong	Higher cost; Variability in sustainability
Government provides subsidy + commercial insurance companies operate model	Improved	Relatively low coverage rate; Relatively high benefit level	Relatively weak	Strongest	Professional; Individualised

All three models have markedly improved administrative efficiency. The involvement of commercial insurers in LTCI administration can effectively reduce operating costs and enhance resource utilisation (Jing and Yang, 2016). Commercial insurers typically possess systematic business management capabilities and are able to collaborate closely with medical and care institutions (Jing, 2010). Large insurers, in particular, can leverage mature management systems to compare service providers and deliver more targeted and personalised care.

In terms of coverage rates, the ‘government purchasing + commercial insurance companies service model’ and the ‘government entrusts + commercial insurance companies agent model’ generally achieve higher enrolment than the ‘government provides subsidy + commercial insurance companies operate model’ (Lu, 2021). This broader issue of enrolment patterns, while not directly tested in this thesis, is a critical context for interpreting the models documented in Chapter Six. The root cause lies in the institutional attributes. The first two models largely follow the logic of traditional social

insurance, using local basic medical insurance populations as the enrolment base. This typically produces three patterns of coverage within the health insurance system – ‘single coverage’ (limited coverage, where only part of the medical insurance population is included), ‘dual coverage’ (partial coverage, where most but not all are included), and ‘universal coverage’ (all are automatically included) (Lu, 2021). This helps explain the higher participation rates observed in these models. Yet this also means that protection levels tend to remain basic. By contrast, the ‘government provides subsidy + commercial insurance companies operate model’ is essentially a commercial insurance scheme in which enrolment is not compulsory. Because commercial insurers are profit-oriented, the scheme’s coverage is considerably narrower. However, its higher premiums usually correspond to more generous benefits. For example, in Beijing’s Haidian District the monthly care allowance for people with moderate and severe disability is higher than in Qingdao or Suzhou, and Haidian District of Beijing is the only city to provide a standard benefit for those with mild disability (Lu, 2021; The People’s Government of Haidian District, 2016). Nevertheless, this model has not overcome the problem of adverse selection; in particular, people aged over 60 are often excluded from coverage. High premiums and voluntary enrolment further dampen residents’ willingness to participate.

According to Lu (2021), with respect to risk control, there is an inverse

relationship between the government's capacity to manage the system and the degree of discretion granted to insurers in fund management. This broader insight helps interpret the policy shift observed in the structured comparative policy review, where second-batch pilots reduced insurer roles in fund management. In the 'government purchasing + commercial insurance companies service model', insurers handle only basic administrative tasks, allowing the government to retain strong control and to address systemic risks in a timely manner. As authority over fund management shifts to insurers, however, governmental oversight weakens. In the 'government entrusts + commercial insurance companies agent model', insurers are involved in premium collection and charge management fees. Although they do not directly engage in investment operations, their profit incentive is stronger. In the subsidy model, the winning insurer effectively takes full responsibility for local LTCI, bearing fund management risks while also receiving government backing. This combination makes bidding particularly attractive (Lu, 2021).

There are also striking differences in disability assessment. While this characteristic is not reflected in the policy review on disability assessment or PPPs in Chapter Six, it has manifested distinctly in their practical operation. In the 'government purchasing + commercial insurance companies service model', insurers tend to classify applicants as 'less severely disabled' to reduce payouts (Lu, 2021). In the government entrusts + commercial insurance companies

agent model', assessments are conducted by independent institutions, but the high opportunity cost of expert involvement means that without adequate market-based remuneration, efficiency is difficult to sustain (Lu, 2021). The 'government provides subsidy + commercial insurance companies operate model', although subject to adverse selection and high premiums, often provides more specialised and personalised assessment services, financed by higher contributions (Lu, 2021).

In sum, each PPP model has advantages and drawbacks: the first two achieve relatively high participation rates and ensure basic protection, but depth of coverage is limited. The subsidy model offers more generous benefits and more professional assessment but suffers from low enrolment and weaker risk control.

2. Existing Problems

Although PPP models have improved administrative efficiency and enriched institutional options for LTCI, several significant challenges remain. These points represent critical areas for future policy consideration that emerge from, but are not limited to, the findings documented in Chapter Six.

(1) Low recognition of commercial insurance and limited supplementary role.

Driven by policy initiatives and market responses, China's commercial LTCI market is undergoing structural transformation. On the supply side, insurers are

experimenting with diversified, collaborative innovations, with products covering areas such as smart monitoring and cognitive rehabilitation. However, the sector is still in its infancy. Inadequate policy frameworks, lagging industrial development, and limited public trust have hindered the supplementary function of commercial insurance (Xiang and Yang, 2025). This is a systemic challenge that affects all PPP models explored in Chapter Six.

(2) Incomplete policy and industrial environment.

At the policy level, there is a lack of dedicated national legislation for LTCI, and the framework for coordination between commercial and social LTCI remains underdeveloped. As a result, service quality and effectiveness are difficult to guarantee (Xiang and Yang, 2025). At the industrial level, large insurers dominate due to advantages in professional expertise and resource integration, while small and medium-sized firms are being crowded out. This ‘capital siphoning effect’ (i.e. capital concentration that drains resources from smaller competitors) weakens market competition and is detrimental to the sector’s overall development (Xiang and Yang, 2025).

(3) Ambiguous roles of market and social actors, with insufficient coordination of interests.

Tensions exist between the profit-driven nature of market actors and the public responsibility of social actors, resulting in resource waste and uneven service

quality (Hu et al., 2025). Insurers, private care homes, and rehabilitation centres often prioritise profit maximisation, while paying insufficient attention to social value creation (Hu et al., 2025). The government has yet to establish effective mechanisms to reconcile these interests, leading to difficulties in financing, administration, and service provision (Hu et al., 2025). This is a fundamental governance challenge inherent to the PPP approach documented in this thesis.

(4) Inadequate regulatory system and weak administrative capacity.

Current supervisory mechanisms for LTCI remain underdeveloped. Problems include ambiguous entry criteria for insurers, low transparency in fund management, and unclear compensation standards (Hu et al., 2025). Moreover, administrative capacity for LTCI is limited: in most pilot cities, medical insurance departments have not increased staffing to cover LTCI responsibilities (Wang, 2025). While many regions delegate part or all administrative tasks to commercial insurers, their overall management capacity is limited, and long-term strategic commitment is lacking (Wang, 2025). Each of the three delegation models has strengths and weaknesses, but there is no national framework to guide consistent selection and oversight. Key issues such as entry and exit conditions for insurers, contract management, payment and incentive mechanisms, and regulatory procedures remain to be standardised (Wang, 2025). This point directly connects the empirical finding of varied delegation to a broader critique of regulatory fragmentation.

In summary, Section 8.2 has delineated the institutional evolution of the LTCI pilots. The analysis, grounded in the policy review of Chapter Six and situating these findings within a broader context, has critically examined the achievements and challenges across four core dimensions. Having established this institutional context, the thesis now turns to the critical issue of fiscal sustainability in Section 8.3. This subsequent section integrates the quantitative projections from Chapter Seven to evaluate the fiscal implications of expanding coverage, the pressure of different subsidy patterns, and the capacities of various government levels.

8.3 Analysis of Fiscal Sustainability

Following the comparative analysis of policy documents and institutional design presented above, this chapter proceeds to a discussion of the quantitative results. Chapter Seven, drawing on historical data and model-based projections, evaluates the fiscal sustainability of extending the pilot LTCI scheme nationwide. It also highlights the differences in fiscal pressure and applicability arising from the varying subsidy models adopted by local governments during the financing stage. Building upon these quantitative findings, Section 8.3 undertakes an analysis from the perspective of central-local relations, focusing on trends in the subsidised population, patterns of fiscal subsidy, and fiscal pressures, to deepen the understanding of the prospects for LTCI policy expansion.

8.3.1 Subsidised Population

From an overall perspective, the scale of the subsidised population covered by the LTCI pilot cities in China demonstrates marked divergence between 2016 and 2035 (see Sections 7.3.1 and 7.3.2). One category of policy primarily targets participants in the UEBMI, for whom the subsidised population exhibits a general upward trend. This may reflect the expansion of the employed population alongside the progressive consolidation of the UEBMI system, leading to a sustained increase in the number of beneficiaries. By contrast, another category of policy primarily subsidises participants in the Urban and Rural Resident Basic Medical Insurance (RBMI), where the subsidised population tends to decline. This decline may correspond to the gradual contraction of the RBMI-insured population, a trend shaped both by demographic change and by the narrowing scope of insurance coverage as well as local fiscal policy adjustments. In addition, certain regions reveal periodic fluctuations, often attributable to adjustments in the coverage of subsidies during the pilot phase. For example, extending from initially covering only the UEBMI population to encompassing all insured groups, or conversely, contracting from universal coverage to partial coverage, thereby generating distinct inflection points in the time-series data.

At the provincial level, overall trends broadly mirror those observed at the

municipal level, though some differences are apparent. For instance, although Henan Province provides subsidies only to RBMI participants, its subsidised population remains among the largest nationwide due to its vast population base. By contrast, in provinces where subsidies apply only to specific groups (such as retirees enrolled in UEBMI or government and public institutions employees), the overall scale is relatively limited. In terms of trajectory, nine provinces show a downward trend, with Henan, Jiangsu, Zhejiang, and Jiangxi being most prominent, reflecting the combined effect of a shrinking RBMI population and mounting demographic pressures from ageing. In contrast, government subsidies in provinces such as Anhui, Shandong, and Shaanxi display growth, plausibly driven by urbanisation and the resulting expansion of UEBMI coverage. Sichuan illustrates the particularity of a mixed subsidy model: while the retired UEBMI population continues to rise, the decline in RBMI participants is more pronounced, producing an overall downward trajectory.

At the national level, projected outcomes are comparatively smooth and stable, but the structural divergence is more clearly revealed: the scale of subsidies associated with the UEBMI population (including both employed and retired individuals) continues to expand, whereas that of the RBMI population (including children and students) declines. This divergence reflects not only policy design but also the fundamental demographic transformation of China: population ageing is steadily enlarging the retired cohort, while declining fertility

and a shrinking school-age population reduce the coverage base of RBMI.

In sum, the rise or fall in the subsidised population should not be regarded as an isolated phenomenon, but rather as the joint outcome of institutional arrangements, demographic dynamics, and broader socio-economic factors. This quantitative profile, detailed in Chapter Seven, thus serves as a critical bridge to the subsequent analysis, which interprets these trends by contextualising them within the wider body of literature and the established framework of socio-economic factors.

RBMI-Insured Population

Since 1998, China has successively established three basic medical insurance schemes: the UEBMI, the New Rural Cooperative Medical Scheme (commonly known as New Rural Cooperative Insurance), and the Urban Resident Basic Medical Insurance (Ye and Tang, 2024). Prior to 2016, China's basic medical insurance system was fragmented along urban-rural lines (Ye and Tang, 2024). To address the problems arising from this fragmentation, reduce disparities, and promote greater equity in healthcare, the Chinese government initiated a reform in 2016 (Ye and Tang, 2024). This reform integrated the Urban Resident Basic Medical Insurance and the New Rural Cooperative Medical Insurance into a unified system, known as the Urban and Rural Resident Basic Medical Insurance (RBMI) (Ye and Tang, 2024). By the end of 2022, China's basic

medical insurance covered 1.346 billion people, with the enrolment rate consistently above 95 per cent since 2011 (Ye and Tang, 2024).

However, research based on multi-source survey data indicates that universal coverage has not yet been fully achieved. Apart from the *China Health and Nutrition Survey (CHNS)*, which reports an actual enrolment rate of 98.88 per cent, other large-scale surveys (including the *China General Social Survey*, the *Chinese Social Survey*, the *China Family Panel Studies*, and the *China Household Finance Survey*) suggest overall enrolment rates of around 90 per cent (Wang, 2020). This implies that more than 10 per cent of the population remain outside the system, with migrants (i.e., individuals who relocate across regions for work and are not registered under the local household registration system, hukou) constituting the main uninsured group (Wang, 2020). Due to institutional fragmentation and restrictions linked to the hukou system, migrants often face unequal benefit entitlements, difficulties accessing medical services outside their place of registration, and obstacles in reimbursement procedures (Wu and Wan, 2025). As a result, their enrolment rate remains relatively low, with discontinuous participation (underinsured, lapse in coverage, discontinuation of coverage) a particularly prominent issue (Wu and Wan, 2025).

Recent *Statistical Bulletins on the Development of the National Medical Security System* published over the past three years by the National Healthcare

Security Administration also demonstrate a declining trend in RBMI enrolment. Compared to the previous year, the number of insured individuals decreased by 2.50 per cent in 2022, 2.09 per cent in 2023, and 1.64 per cent in 2024 (National Healthcare Security Administration, 2025; National Healthcare Security Administration, 2024; National Healthcare Security Administration, 2023; National Healthcare Security Administration, 2022). According to official explanations, the decline primarily reflects two factors: changes in the structure of the insured population and improvements in the quality of enrolment, meaning more accurate verification and removal of duplicate or inactive accounts (Ye and Tang, 2024).

In contrast, academic research highlights three broader explanations. The first concerns individual characteristics. Age, income, region, hukou status, and education are all significant determinants. The likelihood of enrolment increases with age, as older individuals, facing declining health, are more motivated to participate in insurance to mitigate medical expenses (Li et al., 2022; Wang and Liu, 2024; Zhou et al., 2015). Income is negatively correlated with participation. Higher-income individuals are more likely to choose commercial health insurance or alternative arrangements (Zhu and Peng, 2009). Geographical variation is also evident. Residents in eastern China are more likely to withdraw from insurance than those in central or western regions (Wang, 2020; Zhu and Peng, 2009; Wang, 2023). Weaker enforcement in urban areas further

contributes to lower enrolment rates compared with rural populations (Luo, 2019; Zhou et al., 2015). Education has a protective effect. Longer years of schooling are associated with lower withdrawal probabilities, as better-educated individuals are more aware of the benefits of risk pooling in public insurance (Ye and Tang, 2024; Niu, 2025).

The second explanation derives from the perspective of adverse selection. Due to information asymmetry, individuals with higher health risks are more likely to conceal their conditions and enrol, while those with lower risks may opt out, leading to an insured pool with overall worse health outcomes and higher costs (Cutler and Zeckhauser, 1998). This dynamic threatens the sustainability of the insurance fund and undermines its effective operation (Ye and Tang, 2024). Empirical studies confirm that China's basic medical insurance suffers from adverse selection (Wang and Liu, 2024). In addition, approximately 5 per cent of participants discontinue their enrolment, often influenced by their health status (Ye and Tang, 2024).

The third explanation concerns institutional design. The principle of enrolment based on place of hukou registration results in localised administration, making it difficult for local authorities to manage coverage for outward migrants. This creates problems of portability, particularly for long-distance inter-provincial migration, and contributes to lapses in coverage (Li et al., 2022). The principle

of voluntary enrolment further allows individuals to opt out under the influence of personal or contextual factors. Moreover, the annual renewal system (where residents must re-enrol each year) adds dynamism and choice, but also increases discontinuity (Deng et al., 2024). Rising contribution levels, coupled with relatively limited outpatient reimbursement under Resident Insurance (which primarily covers catastrophic illness), further disincentivise participation (Ye and Tang, 2024).

Taken together, these findings suggest that China's basic medical insurance system continues to face significant institutional and practical challenges. While coverage has expanded impressively over the past two decades, gaps and structural weaknesses remain, rendering the goal of universal health insurance coverage difficult to achieve. As eligibility for enrolment in LTCI and eligibility for receiving subsidies are both linked to participation in the basic medical insurance system, pilot regions that use RBMI enrolment as the criterion for determining subsidy recipients in the financing of LTCI will also experience a declining number of subsidised individuals between 2025 and 2035. For these regions, this trend effectively represents a gradual easing of their fiscal pressure.

UEBMI-Insured Population

The Urban Employee Basic Medical Insurance Scheme was first introduced in

the late 1990s. Its purpose was to reduce the dependence of workers' medical insurance on the financial capacity of individual enterprises, and to expand insurance coverage among employees. The scheme covers not only employees of enterprises, government agencies, and public institutions, but also self-employed individuals without employees, part-time workers not insured through an employer, and other categories of flexible employment (Zhao et al., 2025). Between the end of 2021 and the end of 2024, the number of individuals enrolled in the Urban Employee Insurance increased by 25.17 million (National Healthcare Security Administration, 2025; National Healthcare Security Administration, 2024; National Healthcare Security Administration, 2023; National Healthcare Security Administration, 2022). Participation is mandatory for urban employers and their employees: employers are required to contribute on behalf of their staff, while employees must also make individual contributions. Consequently, anyone in formal employment is automatically included in the scheme (Luo, 2019). According to the Statistical Bulletin on the Development of the National Medical Security System published by the National Healthcare Security Administration, enrolment in the UEBMI has shown steady annual growth: the number of insured individuals increased by 2.29 per cent in 2022, 2.35 per cent in 2023, and 2.30 per cent in 2024 compared with the previous year (National Healthcare Security Administration, 2025; National Healthcare Security Administration, 2024; National Healthcare Security Administration, 2023; National Healthcare Security Administration,

2022).

Human capital and individual choices play a decisive role in determining access to medical insurance. Workers who are unable to accumulate sufficient human capital, or who choose part-time employment or career interruptions in order to accommodate family responsibilities, are less likely to obtain employer-based medical insurance (Luo, 2019). Evidence also suggests that employees with lower levels of education are less likely to be covered by employment-based health insurance (Ahluwalia and Bolen, 2008). Similarly, workers who experience interruptions in their career trajectories have a lower probability of gaining insurance compared to those with continuous employment (Luo, 2019). An individual's position in the labour market is also crucial because those unable to enter large firms, state-owned sectors, or high-income occupations are significantly less likely to obtain employment-based health insurance (Luo, 2019).

In summary, the variation in the scale of subsidised groups not only reflects differences in the design of LTCI policies but is also deeply embedded in the broader context of the evolution of China's basic medical insurance system and demographic change. However, the scale of the subsidised population is only one dimension in assessing the fiscal sustainability of LTCI. Section 8.3.1 will further integrate the projections of fiscal subsidy amounts presented in Section

7.3.2 and the subsidies-to-GPBR ratio projected in Section 7.3.3. This will allow for a deeper analysis of the fiscal pressures that different subsidy models (fixed-sum, proportional, and mixed) may generate at the municipal, provincial, and national levels, thereby providing a more comprehensive evaluation of the financial feasibility and policy adaptability of the LTCI system during its implementation.

8.3.2 Fiscal Subsidy Patterns

This section divides the analysis of fiscal subsidy models into two parts: (1) Fiscal Subsidy Paths Across Regions; (2) Trade-offs and Limitations of the Subsidy Patterns. The former, drawing on the projections presented in Chapter Seven, outlines the fiscal subsidy paths and their characteristics at the municipal, provincial, and national levels. The latter situates the analysis within an international comparative perspective, drawing on relevant cases from OECD countries to examine the trade-offs and inherent limitations of different subsidy models.

Fiscal Subsidy Paths Across Regions

At the municipal level (see Tables 34 to 36), LTCI pilots exhibit two main types of fiscal subsidy models: fixed-sum subsidies and proportional subsidies. The results indicate that cities adopting fixed-sum subsidies generally maintain smaller expenditure scales, with fluctuations closely aligned with changes in the

subsidised population. This suggests that under the fixed-sum model, fiscal pressure is primarily determined by demographic shifts, rendering government expenditure relatively predictable. However, the substantial variation in subsidy standards across different cities underscores the high degree of local discretion and the unevenness inherent in policy implementation.

By contrast, cities operating under the proportional subsidy model (such as Jingmen and Guangzhou) display significantly higher fiscal expenditure levels, with projections showing rapid growth over time. Notably, even where the subsidised population remains stable or declines, government spending continues to rise. This divergence between demographic trends and fiscal outlays highlights the proportional model's dependence on broader macroeconomic variables.

At the provincial level (see Tables 37 to 39), fiscal subsidy models are even more diverse, with greater disparities than those observed among municipalities. Overall, the 17 provinces studied fall into three categories: fixed-sum subsidies, proportional subsidies, and mixed subsidies. Under the fixed-sum model, there is striking variation in per capita subsidy standards, ranging from RMB 1.4 to RMB 120. Expenditure trajectories closely track demographic changes. For example, Gansu maintains rising expenditure owing to a relatively high subsidy level, whereas Zhejiang (despite similarly high standards) shows

a declining trend due to population reduction. Shandong, leveraging its large population base, surpasses Zhejiang in total expenditure. This illustrates that both demographic structure and subsidy levels jointly shape fiscal pressure.

In the proportional model, expenditure is strongly correlated with coverage breadth. Hubei, with a wide coverage base, records much higher outlays than Shanxi or Yunnan, though with relatively modest growth. In contrast, Shanxi and Yunnan, despite lower overall spending due to limited coverage, exhibit more pronounced growth trends. This points to the dual dependence of proportional models on both economic indicators and policy scope. Mixed models, exemplified by Sichuan, present a 'counterbalancing effect': rising expenditure on retirees is offset by declining expenditure on residents covered under the basic medical insurance scheme. The overall trajectory shows an initial decline followed by subsequent growth, reflecting the complexities of balancing fiscal pressure across population groups. Collectively, these provincial patterns reveal a policy dilemma: while flexible local experimentation accommodates diverse economic and demographic conditions, the wide disparity in standards risks deepening regional inequalities in protection levels.

At the national level (see Tables 40 to 42), the three subsidy models exhibit distinct characteristics. Under the fixed-sum model, fiscal expenditure closely follows changes in the insured population. This is particularly evident in

schemes covering residents under the RBMI. As enrolment is projected to decline substantially over the next decade, government spending is also expected to fall sharply. This finding is consistent with municipal and provincial patterns, confirming the model's predictability, yet also raising concerns about equity due to significant differences in protection levels.

In contrast, the proportional approach places far greater pressure on fiscal expansion. Although the overall number of insured individuals is projected to decline, rapid growth in disposable income and pension levels more than offsets demographic reductions, driving sustained increases in government expenditure. The scenario modelled on Hubei's policy, which covers all basic medical insurance participants, poses the highest fiscal risk at the national level. It is forecast to reach nearly RMB 1.47 trillion by 2035, a figure well above the projections for both the fixed sum and mixed models. Similar to the provincial cases (Shanxi and Yunnan), the national proportional model's costs are driven by economic growth, while the vastly larger scale of national implementation intensifies concerns over its sustainability.

The mixed model at the national level projects expenditure falling between the other two. Its trajectory neither rises as steeply as in the proportional model nor declines as markedly as in the fixed-sum model, resulting in a comparatively moderate fiscal pressure. This mirrors the experience of Sichuan, where the

opposing logic of subsidy design partially offset one another. Nonetheless, the institutional complexity inherent in mixed models may complicate efforts at nationwide implementation.

Against the backdrop of rapid economic growth and population ageing, the proportional model carries the greatest risk of fiscal expansion; the fixed-sum model, while more stable and predictable, risks exacerbating disparities in protection; and the mixed model may represent a pragmatic compromise between equity and sustainability.

Trade-offs and Limitations of the Subsidy Patterns

This chapter argues that fixed-sum fiscal subsidies in the contribution or premium financing stage of LTCI are subject to inherent limitations. According to forecasts of fiscal subsidy growth rates for the period 2025–2035, the increases range between 1 per cent and 65 per cent, while the decreases fall between 4 per cent and 44 per cent, with both upward and downward adjustments occurring in a relatively even and moderate manner. By contrast, proportional contributions fluctuate far more markedly over a ten-year horizon, with increases ranging from 79 per cent to 124 per cent. At first glance, fixed-amount financing appears more manageable than proportional financing in terms of stability. However, this may merely reflect ‘pleasing figures on paper rather than subsidies reaching their intended beneficiaries’.

The limitations of such fixed subsidies may be illustrated by the case of the United States' Medicare Part D prescription drug insurance. Decarolis et al. (2020) find that the programme's current subsidy mechanism is essentially equivalent to a flat voucher or lump-sum subsidy. While this design ensures fiscal predictability and prevents expenditure escalation from rising medical costs or insurers inflating their bids, the fixed subsidy does not adjust over time. As a result, the risk of cost increases is transferred to consumers, and enrollees' effective protection gradually erodes (Decarolis et al., 2020).

A similar design is evident in many OECD countries, where governments complement tax-based incentives for retirement savings with non-tax incentives, most notably fixed nominal subsidies and matching contributions (OECD, 2024). In Austria, for example, the state-sponsored retirement provision plan provides a maximum top-up of EUR 141.86 in 2024 (OECD, 2024). The German *Riester* scheme grants an annual basic subsidy of EUR 175 for single individuals and child allowances between EUR 185 and EUR 300 (OECD, 2024). In the Czech Republic, participants contributing at least CZK 1,700 per month receive a flat state contribution of CZK 340, regardless of income level (OECD, 2024).

From a fiscal perspective, this mechanism provides strong predictability and effectively prevents the escalation of public expenditure that would otherwise

arise under proportional subsidies, either from rising medical costs or from insurers inflating their bids. On the surface, it therefore generates favourable fiscal numbers and ostensibly controllable expenditure. As healthcare costs increase over time, however, the fixed subsidy is not adjusted accordingly, resulting in the gradual erosion of enrolees' actual protection levels. In other words, although fixed subsidies perform well in terms of fiscal controllability, their inadequacy in sustaining long-term protection effectiveness exemplifies the policy dilemma of being 'nominally appealing yet substantively insufficient'.

Taken together, these examples highlight a common design feature: subsidies are defined in fixed nominal amounts that do not automatically adjust with inflation or rising living costs. While such mechanisms provide governments with fiscal stability and administrative simplicity, their real value steadily declines, undermining their effectiveness in maintaining long-term saving and protection incentives. This dynamic closely parallels the fixed-sum subsidy model in China's LTCL, where fiscal outlays appear stable and manageable on paper, yet the real level of protection diminishes as care costs escalate and demographic ageing intensifies.

As for proportional subsidy, a useful point of reference is Canada's Canada Health Transfer (CHT). Following reforms adopted in the mid-2010s, the CHT now operates as a block grant whose annual growth is mechanically indexed

to a three-year moving average of national nominal GDP, subject to a statutory minimum increase of 3 per cent per year (Béland and Tombe, 2023). This legislated formula ties the expansion of federal health transfers directly to macroeconomic performance, providing provinces and territories with a predictable and transparent funding stream (Béland and Tombe, 2023). As Béland and Tombe (2023) note, this arrangement improves budgetary certainty for the federal government but may limit the responsiveness of transfers to rising demographic and health-care cost pressures, particularly under conditions of rapid population ageing.

Unlike Canada's block grant model, which is tied to macroeconomic indicators, the United States allocates federal funds to state Medicaid programmes through the Federal Medical Assistance Percentage (FMAP). Under the provisions of the Social Security Act, each state's federal share is determined by a statutory formula based on the ratio of its per capita income to the national average (with a statutory minimum of 50 per cent and a maximum of 83 per cent) (Code of Federal Regulations, 2025). Consequently, states with lower per capita incomes receive a higher proportion of federal support, whereas wealthier states receive a lower matching rate (Code of Federal Regulations, 2025). Crucially, this matching arrangement applies to all services covered under Medicaid, including LTC. In this way, the FMAP mechanism directly links federal transfers to inter-state economic disparities, thereby enhancing equity

across jurisdictions.

In sum, the three subsidy models embody distinct trade-offs: the fixed-sum model ensures fiscal predictability but risks declining adequacy; the proportional model links expenditure to economic growth yet poses the greatest risk of fiscal expansion; and the mixed model offers a pragmatic compromise between stability and equity, albeit with added institutional complexity. Having clarified the inherent trade-offs among the three subsidy models, a deeper question arises: within China's highly diverse fiscal landscape, which model is best equipped to withstand the pressures created by hierarchical and regional disparities? The following discussion approaches this issue from the perspectives of administrative tiers and regional variation, providing a systematic analysis of how the external fiscal environment shapes the long-term sustainability of different subsidy models.

Importantly, the fiscal sustainability assessments presented in Sections 8.3.1 and 8.3.2 implicitly treat the GPBR as an exogenous and time-invariant denominator. Yet recent empirical evidence from China's LTCI pilots demonstrates that the implementation of LTCI has generated substantial expansion in the formal LTC sector, with markets experiencing, on average, ten additional Long-Term Services and Supports (LTSS) firm entries per year following the pilot introduction (Guo et al., 2025). Structural estimates further

show that LTCI significantly raises expected profitability, by an amount equivalent to approximately 41 per cent of average entry costs, thereby creating strong incentives for continued market expansion and sustained increases in formal employment in the sector (Guo et al., 2025). As Guo et al. (2025) note, these market-entry effects reflect LTCI's broader role as an economic stimulus for the LTSS industry, enhancing producer welfare and accelerating sectoral development. Such expansion of formal LTSS provision implies not only growth in service capacity but also a rise in the local wage base and employment-related fiscal contributions, which, in turn, have the potential to expand GPBR over time.

Consequently, fiscal pressure ratios computed in this thesis may be conservative to the extent that they do not incorporate the dynamic feedback whereby LTCI-induced sectoral growth strengthens the revenue-raising capacity of local governments. This consideration is particularly relevant for regions adopting proportional subsidy models, where fiscal outcomes are more sensitive to broader macroeconomic conditions. In light of this evidence, the interpretation of fiscal sustainability should recognise that LTCI may influence both the numerator (public subsidy expenditure) and the denominator (GPBR), and that long-run assessments need to account for this endogenous evolution of the fiscal base.

8.3.3 Fiscal Pressures: From Data Results to Policy Challenges

This section aims to interpret the quantitative projections of fiscal pressures presented in Section 7.3.3, situating the results within the distinctive fiscal and policy context of China. The discussion is organised into two parts: (1) Fiscal Subsidy Pressures in Different Administrative Levels; (2) Policy Challenges Arising from Intensified Fiscal Pressures. The former focuses on interpreting the hierarchical and regional patterns revealed by the data itself, while the latter moves beyond the data to examine how these fiscal pressures interact with institutional factors such as China's central-local government relations and its tradition of policy piloting. From this interaction emerge the core challenges facing the nationwide expansion of LTCL. These issues will be further explored in Section 8.4, from the perspectives of central-local relations and policy diffusion theory.

Fiscal Subsidy Pressures in Different Administrative Levels

In terms of the overall evolutionary trend of fiscal revenue, the quantitative forecasts reveal a clear hierarchical structure. At the municipal level, fiscal revenues exhibit the most pronounced heterogeneity and volatility. At the provincial level, growth momentum is stronger, though accompanied by evident regional divergence. At the national level, by contrast, the trajectory tends towards a more stable and linear pattern of growth. In other words, as the administrative level ascends, fluctuations in fiscal revenue are progressively

‘absorbed’, resulting in greater stability and resilience. This pattern underscores the pivotal role of central finance in mitigating regional disparities and cushioning localised instability.

With respect to regional differences, whether at the municipal or provincial level, areas with stronger economic foundations are generally associated with higher levels of public budget revenue and faster growth rates. For example, Beijing, Jiangsu, and Zhejiang are projected to maintain relatively high fiscal levels throughout the forecasting period, whereas provinces such as Jilin and Henan display markedly lagging growth. This disparity not only reflects the unevenness of economic development but also signals the likelihood of regionally differentiated fiscal pressures during the future expansion of the LTCI scheme.

As for the relationship between fiscal subsidies and public budget revenues, the results suggest that in most regions subsidy pressure is expected to gradually diminish over the coming decade, particularly under fixed-subsidy or mixed-subsidy models, where fiscal stress tends to ease over time. Nevertheless, certain regions and models deviate from this general trend. For instance, at the municipal level in Qingdao and Guangzhou, and at the provincial level in Hubei and Yunnan, subsidy pressure is projected to continue rising over the forecast period. This phenomenon indicates that the interaction between subsidy models and local economic growth trajectories is of critical

importance: in areas with relatively sluggish growth, proportional subsidies may lead to the accumulation of fiscal pressures.

When extrapolating the pilot models to the national level to compare the expansionary effects of different subsidy mechanisms, it becomes evident that fixed-subsidy and mixed models demonstrate stronger long-term fiscal sustainability. Proportional subsidies, while advantageous in expanding in tandem with revenue growth, may nevertheless engender a gradual increase in structural fiscal pressure at the national scale. This finding carries important policy implications, highlighting the need for decision-makers to strike a balance between fiscal affordability and institutional equity.

Policy Challenges Arising from Intensified Fiscal Pressures

The evolution of LTCI reflects the broader logic of Chinese social policy development: from local experimentation, to policy refinement, and ultimately to nationwide diffusion (Ning, 2014; Zhou et al., 2025). The pilot approach has allowed municipalities to innovate within their socio-economic contexts, generating practice-based evidence for central decision-making while reducing systemic risks. However, this decentralised experimentation has also led to institutional fragmentation, particularly in financing, provider payment, and benefit design (Zhou et al., 2025).

Regional disparities in fiscal capacity constitute the structural basis of this fragmentation. Empirical studies demonstrate that inequalities in revenue-raising capacity among Chinese cities have widened steadily, leaving weaker regions increasingly vulnerable to imbalances between revenue and expenditure (Yan et al., 2024). Fiscal volatility further compounds this problem: local revenues, shaped by post-1994 tax-sharing arrangements, rely heavily on volatile sources, with limited fiscal transparency undermining stability (Ding et al., 2024). Under such conditions, proportional subsidies may magnify fiscal pressure in downturns, producing a cycle of volatility and fiscal stress.

The central government plays a pivotal role in absorbing these disparities and stabilising the fiscal system. Historical evidence shows that since the 1979 fiscal reforms, fluctuations at subnational levels have been progressively dampened by the centralisation of stable tax sources and countercyclical transfers (Shen et al., 2012; Xing and Fuest, 2018). This ‘hierarchical absorption’ explains why fiscal revenues become progressively smoother as the administrative level rises and underscores the central state’s function as a redistributive and stabilising agent.

For LTCI expansion, these dynamics highlight the need for carefully tailored subsidy models. Fixed and mixed subsidies, consistent with earlier findings on the countercyclical role of central transfers (Shen et al., 2012; Xing and Fuest,

2018). , appear more conducive to long-term stability. By contrast, proportional subsidies, although flexible in adjusting to revenue growth, risk exacerbating fiscal fragility in less-developed provinces such as Yunnan and Guizhou (Liu et al., 2022b). A differentiated approach, combining central redistribution with subsidy designs adapted to regional economic foundations, will therefore be essential to ensuring both fiscal affordability and institutional equity in the nationwide roll-out of LTCI.

Beyond the subsidy-focused analysis presented above, an additional lever for strengthening the long-term financing capacity of LTCI lies on the contribution side. International experience demonstrates that mature LTCI systems frequently combine public subsidies with adjustable contribution rates for insured individuals or employees, allowing revenues to evolve in step with demographic and economic pressures (Francesca et al., 2011). While the present chapter has concentrated on government subsidies as the principal variable shaping fiscal pressure in China, situating the emerging LTCI framework within a comparative perspective suggests that the calibration of contribution rates may, over the longer term, constitute an important mechanism for reinforcing system-wide financial sustainability (Francesca et al., 2011). International systems further illustrate that the scope for adjusting contribution rates encompasses periodic increases, differentiated rates across population groups, and automated mechanisms that respond to demographic

or expenditure trends, thereby offering multiple pathways for strengthening the revenue capacity of an emerging LTCI system such as China's.

This is evident in Germany's LTCI system, which was introduced in 1995/96 as a universal entitlement financed through mandatory social insurance contributions (Francesca et al., 2011). As noted by Ikegami (2019), Germany relies on periodic adjustments to contribution levels to maintain fiscal balance as demand increases, with benefits provided in both cash and services and dependency levels assessed by medical teams, thereby generating a stable but evolving revenue base aligned with expenditure trends. Japan's LTCI system, introduced in 2000 and modelled in part on the German experience, similarly depends on contributory financing, particularly from those aged 40–64, to support a comprehensive benefit package whose generosity is rooted in pre-LTCI expansions of social services and long hospital stays funded through health insurance (Ikegami, 2019). Ikegami (2019) observes that these inherited commitments significantly increased Japan's financial requirements and that cost-containment measures had only marginal effects, highlighting the consequent need for periodic contribution adjustments to secure sufficient funding. OECD comparative analysis reinforces this pattern, showing that countries with higher public LTC expenditure relative to GDP, such as Germany and Japan, commonly finance these commitments through mandatory contribution mechanisms, with revenues adjusting over time to meet rising

system costs (Francesca et al., 2011).

Compared with government subsidies, which are constrained by fiscal capacity and vulnerable to cyclical pressures, contribution-based revenues offer a more predictable and structurally stable financing stream, thereby mitigating long-term fiscal vulnerability. Placing China's LTCl within this international context suggests that, although the system currently relies heavily on government subsidies and basic medical insurance funds, the future expansion and formalisation of adjustable contribution rates, building on the differentiated contribution arrangements already present in some pilot cities, could broaden the revenue base and align China's financing structure more closely with international practice, where contribution-based adjustments function as a counterweight to rising expenditure and a stabilising mechanism for long-term fiscal sustainability.

8.4 Central-Local Government Relations and Policy Diffusion

Building on the empirical findings from Chapters Six and Seven, this section shifts the focus to a more macro-level analysis. The aim is to examine China's LTCl pilot policy through the lenses of central-local government relations and policy diffusion theory perspective. Unlike the previous two sections (Section 8.2 and 8.3), which were closely anchored in the empirical data, the analysis here moves beyond specific data points. Instead, it emphasises the broader

institutional dynamics and strategic interactions that shape the trajectory of policy experimentation, thereby offering a theoretical synthesis that extends and deepens the earlier findings.

8.4.1 Central Coordination

The central government coordinates with local authorities to advance economic and social policy reforms to secure balanced regional development. Unlike economic policies, which emphasise designing mechanisms to incentivise actors to pursue profit, social policies consume fiscal resources and must clearly specify the sources of programme funding. In the case of LTCI scheme, some cities had already begun exploring localised systems of LTC prior to the issuance of central directives (for example, Qingdao and Shanghai). These pioneering initiatives, together with lessons drawn from international experiences such as those of Germany and Japan (see Wang et al. (2022); Ma and Zhang (2022a)), laid the foundation for central policy coordination in China. In July 2016, the Ministry of Human Resources and Social Security issued the first guidance document for a two-year pilot programme on LTCI. Following consultation with local governments, fifteen affluent cities and two provinces were selected in a top-down manner to initiate the pilots. The guidance outlined only broad policy objectives, leaving local governments considerable discretion.

Due to the excessive cost of information, a comprehensive recentralisation of authority would heighten the pressure and risk of central decision-making, thereby hindering the formulation of policies adapted to local circumstances (Xuan, 2018). At the same time, effective national governance requires coordination and communication between central and local governments, with a scientific delineation of fiscal and administrative responsibilities across levels. Such a complementary and self-reinforcing relationship constitutes a key condition for the smooth advancement of policy experimentation (Wang and Fang, 2016).

During local experimentation, however, several institutional issues emerged that could not be resolved at the local level and required central coordination. These included: the fairness and sustainability of financing responsibilities; the scope of coverage and equity in scheme expansion; the harmonisation of benefit payment rules and institutional integration; and the unification of disability assessment standards and service management (Chan and Shi, 2022). In September 2020, the National Healthcare Security Administration and the Ministry of Finance jointly issued an extension document, prolonging the pilots for a further two years and providing a clearer national policy framework. This reflected two central considerations (Chan and Shi, 2022): first, that local pilots should begin to converge towards a future national scheme; and second, that policy experimentation would proceed without direct financial support from

the centre. Even so, as the central government assumed no fiscal responsibility, local authorities continued to retain significant autonomy (Chan and Shi, 2022).

8.4.2 Regional Competition

Promotion prospects for local cadres are closely tied to their performance in implementing policy tasks allocated by central leaders, with advancement being more likely if outcomes surpass those of competing provinces (Chan and Shi, 2022; Wu et al., 2022). In the context of centrally authorised pilot programmes, the primary motivation of local cadres is to seize opportunities to improve policy implementation performance indicators (Tao et al., 2010; Yu et al., 2016). Being designated as a pilot city for policy experimentation constituted a form of reward: for local cadres it enhanced career prospects, while for local governments it brought additional fiscal resources (Chan and Shi, 2022; Liu et al., 2018). The implementation of LTCI has provided such an opportunity for the development of the local elderly care industry. LTCI stimulates demand for care professionals and creates employment opportunities for local residents (Chan and Shi, 2022). The rise of service providers, particularly private elderly care institutions, has also contributed to local tax revenues. These considerations encouraged some ageing cities to launch policy initiatives even prior to national-level action. Local practices further reveal that pilot projects did not treat LTCI purely as a social policy, but rather conceptualised it as an economic policy prioritising job creation and the stimulation of the care market (Li, 2020b).

In ‘top-down’ policy experimentation, the main reasons for local government participation lie in the delegation of administrative authority from the centre, policy mandates, and promotion incentives (Xiao and Guo, 2013; Birney, 2014; Chen and Wang, 2013). Among these, promotion incentives constitute a particularly significant driver motivating local governments to respond actively to central initiatives. Local officials often adjust policy design and implementation strategies in line with central preferences in order to secure advantages in performance evaluation and career advancement (Tsai and Dean, 2014; Chen and Zhang, 2025). By contrast, the ‘bottom-up’ model highlights the initiative of local governments and the importance of internal demand, which helps explain why cities such as Qingdao and Shanghai began their explorations prior to the formal issuance of central directives (Tsai and Dean, 2014; Chen and Zhang, 2025).

8.4.3 Local Protectionism

According to Chen (2023a) and Li and Kong (2024), interregional competition in China may be traced to the intrinsic logic of the political system, namely the principle of promotion through performance. Institutional incentives of this kind compel local cadres to prioritise developmental outcomes within their jurisdictions. Yet, local protectionism represents the inevitable corollary of such competition: officials are inclined to preserve and deploy resources locally in

order to maximise regional advantage (Tian et al., 2022). This tendency is reinforced not only by the pressures of performance appraisal, but also by the operation of the household registration (hukou) system, which strengthens the incentive for local cadres to prevent fiscal transfers across regions or the depletion of local revenues by non-resident populations accessing public services (Chan and Shi, 2022). Over time, the imperative to secure limited fiscal resources within one's jurisdiction has become embedded as a prevailing logic of local governance.

The strengthening of local governments' control over their jurisdictions can easily give rise to parochialism, whereby central policies are adapted or selectively implemented at the local level (Xu and Wang, 2013). In the absence of central guidance and oversight, moral hazard may also emerge, with local governments inclined to safeguard their own resources and resist cross-regional fiscal transfers (Zang and Zhang, 2019; Zhang, 2017). These institutional dynamics together constitute the underlying logic of local protectionism.

From an institutional perspective, the central state bears formal responsibility for promoting national coordination by redistributing social insurance surpluses from affluent regions to those facing fiscal stress (Chan and Shi, 2022). More than a decade of policy experimentation, however, has revealed only limited

progress, largely due to the implicit resistance of wealthier regions. The principal point of contention concerns the redistribution of surplus funds: migrant workers frequently contribute to social insurance schemes in coastal cities, yet on retirement they tend to return to their inland hometowns to draw benefits. This mobility generates a structural mismatch between contributions and disbursements (coastal regions accumulate surpluses, while inland regions experience persistent deficits). The result is a strategic contest between centre and locality: fiscally stronger regions seek, through various means, to accelerate the utilisation of their own insurance funds, whereas the central government, committed to supporting disadvantaged areas, must attempt to constrain the entrenched logic of local protectionism (Xu and Wang, 2013).

8.4.4 Policy Diffusion

From the perspective of policy diffusion theory, China's LTCL system has displayed distinct characteristics of diffusion since the launch of pilot schemes in 2016.

First, in the temporal dimension, its diffusion follows the general pattern of policy diffusion, manifesting an 'S-shaped' curve: beginning with only a handful of early adopters and slow expansion, moving into a phase of rapid proliferation under the impetus of central policy, and then reaching a relatively stable stage once the pilot cities had fully implemented the scheme (Wu et al., 2022; Zeng,

2021). At present, the system is largely in the stage of rapid diffusion, with cities not included in the first round of pilots continuing to adopt the scheme.

Second, in the spatial dimension, both neighbourhood effects and vertical effects are evident. Owing to low information transmission costs, intense competitive pressures, and a relatively homogeneous social environment, pioneering cities exert a strong demonstration effect on neighbouring regions, giving rise to widespread imitation and policy follow-up among local governments. At the same time, top-down directives and performance assessments issued by central and higher-level authorities have substantially influenced both the pace and trajectory of diffusion (most notably in the form of hierarchical diffusion, spreading from the more developed eastern coastal areas to central and western regions) (Wu et al., 2022; Zeng, 2021).

Third, in terms of content, the diffusion of LTCI is shaped both by administrative mandates from central and higher-level governments and by mechanisms of learning, competition, and imitation among local authorities. In practice, most local governments show a tendency towards policy convergence in institutional design, with limited scope for locally tailored innovation. This is particularly apparent in financing arrangements and benefit payments, where models from pioneering cities are often adopted wholesale. Such gradualist diffusion has the advantage of lowering implementation resistance, yet it also risks creating

financing and coverage structures misaligned with local fiscal capacities, thereby generating excessive financial strain (Wu et al., 2022). Furthermore, the absence of cross-regional coordination mechanisms has created barriers to inter-jurisdictional reimbursement and institutional linkage. This has, in turn, reinforced local protectionism and impeded the national integration of the system (Wu et al., 2022).

Overall, the drivers of LTCI diffusion arise both from the promotion and institutional design of central government policy and from local governments' rational learning or irrational imitation under the pressures of promotion incentives and policy competition (Wu et al., 2022; Zeng, 2021). The central dilemma, however, lies in how to accelerate the pace of diffusion while avoiding fiscal strain and the risks of institutional homogenisation, and how to establish robust cross-regional coordination mechanisms to secure both equity and sustainability of the policy.

Building on the challenges of China's LTCI pilot policy discussed in this chapter, the following conclusion will not only summarise the main findings of this study but also propose ways to address these challenges, alongside reflections on the thesis's own limitations and future research directions.

CHAPTER NINE: CONCLUSION

9.1 Main Research Findings

9.1.1 Achievement of Research Aims

Aim 1: This aim sought to conduct a structured comparative review of the two batches of pilot policies launched in 2016 and 2020. It aimed to examine the development of China's LTCI system and analyse its institutional changes, achievements, and challenges across four core dimensions. This thesis has fully achieved this aim through the analysis presented in Chapter Eight. Specifically, Section 8.2 establishes a systematic analytical framework that rigorously follows the four core dimensions set out in Aim 1: (1) financing mechanism; (2) benefit design; (3) disability assessment; and (4) public-private partnerships (PPPs). For each dimension, the section first outlines the institutional changes and key achievements from the initial pilot phase to the expansion phase, based on the policy comparison results from Chapter Six. It then critically examines the underlying challenges and structural limitations faced in each dimension. This approach not only provides an empirical description of the pilot policy evolution but also facilitates an in-depth examination of the system's development by contextualising the empirical findings within broader theoretical and policy discussions, thereby fulfilling Research Aim 1.

Aim2: The aim is primarily accomplished in Section 8.3, which integrates the quantitative projections from Chapter Seven and interprets them within the theoretical framework of central-local government relations. Methodological approach: the thesis combines the GM (1,1) grey prediction model with cell-based aggregate projection models, simulating the expenditure trajectories of three subsidy schemes (fixed-sum, proportional, and mixed) across municipal, provincial, and national administrative levels from 2025 to 2035. Analytical process: the evaluation focuses not only on the absolute scale of subsidy expenditures but, more critically, on the fiscal pressure faced by different government tiers through the key indicator of the subsidies-to-GPBR ratio. The analysis also examines the fundamental impact of structural changes in the subsidised population (such as differing trends between urban employee and resident health insurance enrollees) on fiscal sustainability.

By situating the quantitative projections within the context of China's multi-level fiscal system, the thesis provides a comprehensive assessment of the medium-to long-term fiscal sustainability of LTCI subsidies, thereby fully achieving Aim 2.

Aim3: This aim is addressed in Sections 8.3 and 8.4, which together evaluate subsidy designs and situate LTCI's institutional trajectory within broader theoretical frameworks. Evaluation of subsidy types (Section 8.3.2): Fixed-sum

subsidies offer predictability but lack responsiveness to inflation and regional disparities. Proportional subsidies align with economic growth yet exacerbate fiscal volatility and interregional inequality. Mixed subsidies balance stability and fairness but introduce administrative complexity. Institutional analysis (Section 8.4) draws on central-local government relations and policy diffusion theory to explain how LTCI has evolved from local pilots towards a national system: Central coordination set broad goals while permitting local experimentation. Regional competition and promotion incentives drove rapid policy adoption. Local protectionism and fiscal fragmentation hindered cross-regional integration. Policy diffusion followed an 'S-curve', shaped by both top-down mandates and horizontal imitation.

By integrating quantitative subsidy analysis with institutional insights, the thesis fulfils Aim 3, linking fiscal design to broader governance dynamics.

9.1.2 Addressing the Research Questions

RQ 1: What were the key drivers and patterns of policy evolution in China's LTCI pilots between 2016 and 2020 across the core dimensions of financing mechanism, benefit design, disability assessment, and PPPs?

Based on the integrated analysis in Chapter Eight, this thesis concludes that the policy evolution exhibited an overarching pattern of transition from 'localised,

fragmented exploration' towards 'institutionalised, standardised consolidation'.

This pattern was fundamentally driven by the distinctive governance logic of 'central steering coupled with local experimentation'. This pattern manifested concretely across the four dimensions as follows:

(1) Financing mechanism: The evolution moved from a 'simple start-up' reliant on medical insurance funds towards building independent, diversified channels for 'sustainable financing'.

(2) Benefit design: The evolution shifted from providing 'basic, uniform coverage' towards developing a 'multi-tiered and refined' benefit system.

(3) Disability assessment: The evolution transitioned from disparate practices characterised by 'varied tools and differing standards' towards pursuing 'nationally unified, comprehensive, and objective' assessment criteria.

(4) PPPs: The evolution changed from an initial exploratory approach of 'gradually explore and encourage participation' towards emphasising more institutionalised arrangements focused on 'deep involvement and clear functions'.

In summary, the key driver of this policy evolution was the central government's attempt to balance two primary objectives. On the one hand, it aimed to encourage policy innovation and enable a rapid start for the pilots by granting flexibility to local authorities. On the other hand, it needed to learn from and synthesise diverse local experiences through top-level design to mitigate risks,

ensure equity and sustainability, and ultimately steer towards forming a unified national system. The inherent tensions and dynamic adjustments within this ‘piloting-and-scaling’ model constituted the core dynamic behind the evolution of China’s LTCI pilot policy.

RQ2: Under what conditions and policy scenarios is the government subsidy mechanism for LTCI fiscally sustainable at higher administrative levels (municipal, provincial, national) in the medium to long term (2025–2035)?

Fiscal sustainability is most achievable under the following conditions: (1) At the national level, fixed-sum and mixed subsidy models are more sustainable due to revenue pooling and redistribution capacities. Proportional models pose high fiscal expansion risks. (2) At provincial and municipal levels, sustainability depends on local economic strength and demographic structure. Wealthier regions can manage proportional subsidies, while poorer regions are better suited to fixed or mixed models to avoid fiscal stress.

Key enabling conditions include: (1) Central fiscal transfers to offset regional disparities; (2) Automatic adjustment mechanisms (e.g., indexing to wage growth or inflation) to maintain subsidy adequacy; and (3) Integration with broader social insurance reforms to ensure enrolment stability.

RQ3: How do different subsidy designs (fixed-sum, proportional, mixed) interact with the fiscal capacities and policy priorities at different governmental tiers (municipal, provincial, national)?

Fixed-sum subsidies are administratively simple and predictable, aligning with local governments' need for budget stability. However, they often fail to address regional inequities and may erode in real value over time. Proportional subsidies link spending to economic growth, appealing to higher-tier governments with stronger revenue bases. Yet they can overwhelm local fiscal capacities in less developed regions, conflicting with equity priorities. Mixed subsidies allow for tailoring to local conditions, supporting policy priorities of both stability and fairness. However, they require sophisticated administrative coordination, which is more feasible at provincial or national levels.

The interaction highlights a trade-off between fiscal predictability and adaptive equity, with higher-tier governments better positioned to manage complex, redistributive models.

RQ4: How have central-local government dynamics and the process of policy diffusion shaped the institutionalisation trajectory of China's LTCI system?

Central-local dynamics were characterised by 'hierarchical experimentation'. The central government set broad goals and selected pilots, while local governments adapted designs based on fiscal and demographic contexts. This encouraged innovation but also led to fragmentation and protectionism. Policy diffusion followed a spatially and temporally uneven pattern: early pilots in wealthy cities (e.g., Qingdao, Shanghai) served as models for later adopters. Diffusion was driven by top-down mandates, inter-jurisdictional competition, and imitation among neighbouring regions. However, limited cross-regional coordination and entrenched localism impeded the formation of a unified national system.

These processes collectively shaped LTCI's trajectory from localised pilots toward an emerging (though still fragmented) national framework, reflecting tensions between innovation and standardisation, and between local autonomy and central steering.

The next section will set out potential policy recommendations in response to several specific challenges identified in Chapter Eight.

9.2 Policy Recommendations

Against the backdrop of rapid population ageing in China, the establishment of the LTCI system has entered a critical phase. Building on the research findings

and conclusions presented above, this thesis proposes several strategic recommendations to address the overarching challenges identified in Chapter Eight. These recommendations are intended to guide the future development of the LTCI system. The first four recommendations address the core institutional dimensions analysed in Section 8.2, while the final two pertain to the broader systemic issues explored in Sections 8.3 and 8.4.

1. Institutional independence and legal framework.

Most scholars stress that LTCI should be established as an independent form of insurance, gradually separated from the basic medical insurance scheme, in order to avoid unsustainable fund operations and overlapping functions (Xie, 2025; Wang, 2025; Li et al., 2024). From a legal perspective, its status should be formalised either by inclusion in the Social Insurance Law or through standalone legislation. This would clarify the mechanisms of financing, benefit provision, and eligibility assessment, thereby facilitating the transition from policy-based to law-based governance (Liu, 2025; Mu and Rong, 2025).

2. Diversified and sustainable financing mechanisms.

The current system relies heavily on health insurance funds and government subsidies, which makes diversification imperative. A multi-channel financing structure is recommended, involving contributions from individuals, employers, government budgets, commercial insurance, public-interest lotteries, and

charitable donations (Zhang, 2025; Cousins, 2025). Differential premium rates and tiered contribution schemes should also be introduced to strike a balance between fairness and the fund's capacity to withstand financial risks (Zhou et al., 2025; Li et al., 2024).

3. Expanded coverage and equity enhancement.

While the present scheme prioritises coverage for older adults with severe functional impairments, the system should be progressively extended to those with moderate or mild impairments as well as to individuals with dementia, with the ultimate aim of universal coverage (Xie, 2025; Mu and Rong, 2025). Policy design should pay particular attention to rural areas and less developed central and western regions, in order to narrow urban–rural disparities and to safeguard the rights of vulnerable groups such as low-income households and people with cognitive impairments (Chen et al., 2024; Cousins, 2025; Li et al., 2024).

4. Optimisation of service provision and workforce development.

It is essential to build a tiered service delivery system that prioritises home- and community-based care, complemented by institutional care, while promoting the integration of health and social care and the outsourcing of services to social providers (Zhang, 2025; Chen et al., 2024). At the same time, a three-dimensional training framework (encompassing formal education, continuing education, and vocational training) should be established for care professionals.

Improvements in working conditions are required to enhance the attractiveness of frontline care roles (Xiang and Yang, 2025). For family caregivers, training programmes, subsidies, and psychological support should be provided, recognising them as an indispensable supplement to the formal LTC system (Liu, 2025; Hu et al., 2025).

5. System integration and regional coordination.

LTCI should be vertically integrated with medical insurance, pension systems, and social assistance, and horizontally coordinated with other welfare programmes to avoid duplication of benefits and waste of resources (Zhou and Dai, 2021; Zhou et al., 2025). Moreover, a cross-regional transfer mechanism and a unified national information-sharing platform are needed to ensure continuity of coverage for mobile populations, thereby enhancing the overall effectiveness of the system (Chen and Zhang, 2025).

6. Digitalised supervision and governance enhancement.

Emerging technologies such as big data analytics, artificial intelligence, and blockchain should be applied in eligibility assessments, fund supervision, and service delivery to achieve intelligent management and real-time monitoring (Xiang and Yang, 2025; Zhou et al., 2025; Hu et al., 2025). In addition, the use of 'policy sandboxes' to pilot differentiated schemes can increase institutional adaptability and resilience (Zhou et al., 2025).

In conclusion, the optimisation of China's LTCI system should be anchored in independent legislation, supported by diversified financing, aimed at universal coverage and equity of access, and strengthened by optimised service provision and intelligent regulatory mechanisms. Such a framework would both protect the rights of individuals with functional impairments and secure the long-term sustainability of the system.

9.3 Contribution and Potential Limitations

9.3.1 Contribution of the Thesis

This thesis makes three principal contributions to the literature. First, it addresses a thematic gap by providing one of the first systematic assessments of the fiscal sustainability of government subsidies within China's LTCI financing structure. Whereas existing studies predominantly forecast demand based on demographic and disability trends, this study explicitly evaluates the fiscal pressure of subsidies under scenarios of policy expansion, thereby offering novel insights into the long-term viability of state intervention in LTC financing.

Second, it extends the scope of analysis beyond the initial 2016 pilot cities to incorporate the 2020 expansion, which introduced important institutional innovations. By comparatively reviewing both phases across 29 pilot regions, and by explicitly incorporating the relatively underexplored dimension of PPPs

into the policy comparison, the thesis enriches understanding of China's evolving policy experimentation process and sheds light on achievements, challenges, and institutional change in the design of LTCl.

Third, it contributes methodologically by integrating the GM (1,1) grey forecasting model with a cell-based aggregate projection model, applied simultaneously at the municipal, provincial, and national levels. This multi-scalar approach allows for a more comprehensive projection of fiscal pressure than has been attempted in previous studies, which typically focus on only one level of analysis. By linking the modelling with theoretical perspectives on central-local government relations and policy diffusion, the study advances interdisciplinary understanding of how fiscal sustainability interacts with institutional design.

9.3.2 Limitations

While the research design and findings contribute to filling important gaps, several potential limitations merit consideration:

First, the relatively short history of China's LTCl system constrains the data foundation. Since the pilot scheme and the integration of urban and rural health insurance schemes both began in 2016, the available dataset is necessarily limited in length. Accordingly, the GM (1,1) grey forecasting model is applied

primarily to the most recent five years of data. Although the model is well suited to short-term forecasting, its capacity to capture longer-term structural shifts remains constrained.

Second, the projection models are based on the assumption that historical patterns will broadly continue in the absence of major external shocks. Unexpected developments (such as economic crises, natural disasters, or large-scale public health emergencies) could significantly alter fiscal trajectories. While such assumptions are necessary for operationalising the models, they introduce an inherent uncertainty that should be acknowledged.

Third, the focus of the quantitative analysis is on the financing stage of LTCI, specifically the role of government subsidies. The resulting subsidies-to-GPBR ratios are therefore modest in scale. Should policy expansion move beyond financing to encompass comprehensive service delivery, fiscal pressure may increase in a non-linear manner as social demand for care rises. The estimates presented in this thesis should thus be regarded as conservative with respect to potential long-term fiscal pressure.

These potential limitations do not diminish the validity of the findings but rather indicate avenues where further research could refine, extend, or complement the present study.

9.4 Future Outlook

Building directly on the potential limitations identified above, several directions for future research can be outlined:

First, the restricted length of the available dataset highlights the need for longer time series data once the LTCI system matures. Future studies could revisit the projections with a more extended empirical base, thereby enhancing the robustness of the GM (1,1) model and allowing for more reliable medium- to long-term forecasts.

Second, because the current modelling assumes that historical trends will continue in the absence of major shocks, future work could incorporate scenario-based stress testing. For example, simulations that factor in demographic volatility, economic downturns, or public health crises would allow researchers to assess the resilience of LTCI financing under more uncertain conditions.

Third, this thesis focuses on the financing stage of LTCI, with government subsidies as the core variable. To move beyond this, subsequent research could extend fiscal projections to include expenditure on service delivery. As the system evolves towards covering a more comprehensive range of care

services, projections of the subsidy-to-GPBR ratio could be recalibrated to reflect the potentially non-linear growth of fiscal pressure arising from increased social demand.

Taken together, these avenues for future inquiry would not only refine the accuracy of fiscal sustainability assessments but also broaden their policy relevance. By progressively addressing these limitations, subsequent research can provide a more complete picture of the long-term challenges facing China's LTCI system and inform strategies for its sustainable expansion.

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Appendix

Appendix 1 Summary of selected academic materials

(In the serial numbering, 'C' denotes Chinese-language sources and 'E' denotes English-language sources.)

No.	Author	Year	Title	Journal	Summary
C1	H. Chen and S. Zhao	2021	Financial Sustainability of Long-Term Care Insurance: An Assessment Study Based on Microsimulation Methods and Insurance Reimbursement Data	Insurance Studies	The purpose of this paper is to study a set of long-term care insurance financial sustainability evaluation model (LTCI-MC) based on micro simulation methods and reimbursement data. The effectiveness of the model was tested in Shangrao City, Jiangxi Province, and the financial sustainability of long-term care insurance from 2020 to 2024 was evaluated.
C2	H. Chen, S. Zhao and B. Cui	2021	An Evaluation Study on the Risk of Financial Deficit for the Long-Term Care Insurance Pilots: Based on the Analysis of Operational Scheme in the 15 First-batch Pilot	Chinese Journal of Health Policy	Based on 227 policy-related documents, the financial mechanism of each pilot city was reviewed. Anqing, Chengde, Chongqing, Guangzhou, Qiqihar, Shihezi and Nantong were selected for prediction and analysis. Using CHARLS2015 and 2018 data, the health transfer trajectory of 10,000 individuals from 2020 to 2040 was simulated by microscopic simulation method, and the income and expenditure of the policy after its national rollout were estimated in China.
C3	L. Chen and X. Shi	2021	Forecasting Demand for Long-Term Care Insurance Funds in China	Chinese Journal of Population Science	In this paper, the Markov model is used to calculate the probability of health state transfer using CHARLS2015 and 2018 data. Based on the current policies of 17 long-term care insurance pilot areas, the scale and trend of demand for long-term care insurance funds in China from 2021 to 2030 are predicted.
C4	Q. Chen	2022	Research on the Sustainability of Long-	Soft Science of Health	The purpose of the study is to measure the financial pressure of

			Term Care Insurance Fund in China: Based on the Thinking for Three Types of Payment Groups		long-term care insurance in China from 2020 to 2050. Based on the national statistical yearbook, census data, and CHARLS2015 database, the financial pressure of long-term care insurance for the three types of contributors is predicted.
C5	Y. Chen	2023	Current Situation, Limitations and Optimisation Paths of the Financing of Long-Term Care Insurance in China: Empirical Analysis Based on 27 Pilot Policy Texts	Journal of Beijing University of Aeronautics and Astronautics (Social Sciences Edition)	The paper presents a LTCI financing policy PMC index model consisting of 10 primary variables and 31 secondary variables, with a focus on the financing mechanism, derived from policy texts. This model is utilised to quantitatively assess the financing policies implemented across 27 pilot cities in China.
C6	J. Deng and W. Deng	2017	A Comparative Analysis on Financing Arrangement of the First Batch of Long-Term Care Insurance in Pilot Cities	Chinese Journal of Health Policy	A comparative analysis of long-term care insurance financing schemes across four pilot cities elucidated differences in the nature, funding sources, levels of financing, and equity considerations. Findings underscored a general simplicity in funding sources, inadequate incentivisation, modest overall financing levels, and highlighted shortcomings in the equity of financing structures, suggesting areas for improvement in policy formulation and implementation.
C7	T. Du and Z. Wang	2022	Evaluation of Long-Term Care Insurance Financing Mechanism in China—Based on the Practical Experience of 29 Long-Term Care Insurance Pilot Cities	Health Economics Research	This study examines the development and changes of long-term care insurance across two cohorts of 29 pilot cities through the analysis of policy documents and practical experiences. A comparative assessment is conducted to evaluate the implementation and evolution of long-term care insurance within each pilot city.
E1	P. Guo and Y. Li	2022	Innovation and Financial Sustainability in China's Long-Term Care	Frontiers in Public Health	This study investigates how Nantong achieves 'full coverage' and 'financial sustainability' through institutional

			Insurance: An Empirical Analysis of the Nantong Pilot		innovation. Through field interviews and research, it examines the LTCI system in Nantong, analysing its logic and successful implementation of institutional innovation by integrating international and local experiences. Additionally, the study employs quantitative methods to assess the financial sustainability of the system, finding that the Nantong model effectively mitigates institutional risks through horizontal and vertical transfer payments, diversified financing, and service outsourcing, thereby accomplishing both full coverage and financial sustainability in the long term.
C8	S. Guo	2017	Research on the Financing Mechanism of the Long-Term Care Insurance Based on the ILO Financing Models	Scientific Research on Ageing	The author conducted a comprehensive review and synthesis of long-term care insurance fundraising mechanisms, incorporating literature research and empirical analysis of both domestic and international contexts. Following this, the author employed Shanghai as a case study, applying calculations based on the International Labour Organisation (ILO) financing model to illustrate specific implications within the context of long-term care insurance.
C9	L. Hai and H. Yin	2020	Research on the Financing Mechanism of Long-Term Care Insurance in China	Social Sciences in Hunan	This study examines the long-term care insurance financing framework in the initial group of pilot cities in China, focusing on five key components: insurance beneficiaries, funding mechanisms, financing modalities, standards for funding allocation, and initial capitalisation. The analysis addresses these aspects comprehensively to elucidate the structure and functioning of the long-term care insurance system

					within the first batch of pilot cities.
E2	Y. Han and T. Shen	2022	Long-Term Care Insurance Pilot Programme in China: Policy Evaluation and Optimisation Options- Taking the Pilot Programme in the Northeast of China as an Example	International Journal of Environmental Research and Public Health	This qualitative research investigates the overall status and challenges of China's Long-Term Care Insurance (LTCI) policy pilots, focusing on four pilot cities in three northeastern provinces. Through purposive sampling, the study conducted semi-structured in-depth interviews with 10 LTCI beneficiaries and providers in various nursing homes and 2 operators from the Medical Insurance Bureau. The findings reveal a limited coverage scope, fragmented disability assessment criteria, inadequate substance in service provision, insufficient policy support for informal care, over-reliance on medical insurance funds, and the application of unfair financing standards.
C10	S.-y. He, R.-m. Dai, Y. Wang, M. Jiang, G. Bai and L. Luo	2019	Comparative Research of the Financing Scheme for Long-Term Care Insurance in Pilot Areas in China	Chinese Health Resources	The purpose of this study was to synthesize financing schemes across 15 pilot areas for long-term care insurance (LTCI) in China. This was achieved through the collection and analysis of implementation policies of LTCI in these pilot areas, supplemented by in-depth interviews to validate the information obtained from these policies.
E3	H. Jin, Y. Su, Y. Ping, S. Pickersgill, X. Chen, X. Liu, D. Watkins, Y. Li, H. Liu and C. Wu	2023	Projecting Long-Term Care Costs for Home and Community-Based Services in China from 2005 to 2050	Journal of the American Medical Directors Association	The primary objective of this research was to assess and predict the trajectory of long-term care (LTC) expenditures for home and community-based services as a proportion of China's gross domestic product from 2005 to 2050. Utilising data from 61,249 observations of 37,702 individuals aged 65 years across survey waves conducted in 2005, 2008, 2011, 2014, and 2018 by the Chinese Longitudinal Healthy Longevity Surveys, LTC costs were

					estimated for the years 2005 to 2018 using age-sex-residence-specific weights. Additionally, a component-based model, incorporating a 2-part model for average LTC costs estimation and a multi-state Markov model approach for projecting future populations based on age, sex, and disability state, was employed to forecast LTC costs beyond 2018.
E4	P. Lei, Z. Feng and Z. Wu	2016	The Availability and Affordability of Long-Term Care for Disabled Older People in China: the Issues Related to Inequalities in Social Security Benefits	Archives of Gerontology and Geriatrics	This research assesses the accessibility and affordability of Long-Term Care (LTC) services for disabled individuals aged 65 and above in China, emphasising variations among groups receiving distinct social security benefits. The data is drawn from the nationally representative Chinese Longitudinal Healthy Longevity Survey (CLHLS), revealing that addressing the Long-Term Care needs of socially and economically disadvantaged disabled older people could narrow the gap between them and those enjoying more extensive social security benefits, offering insights for policymakers in China.
C11	C. Li and Y. Qian	2023	Optimisation of Financing and Benefits Payment Policies for China's Long-Term Care Insurance System--Comparative Analysis based on 15 Pilot Cities Nationwide	Southwest Finance	The article undertakes comprehensive research into financing methods, channels, standards, insured entities, payment structures, and other pertinent aspects of long-term care insurance systems. It systematically delineates the implementation strategies employed across 15 pilot cities nationwide.
E5	F. Li and J. Otani	2018	Financing Elderly People's Long-Term Care Needs: Evidence from China	The International Journal of Health Planning and Management	This research addresses the obstacles and suggested strategies for funding China's long-term care (LTC) system. Utilising data from the Chinese Longitudinal Healthy Longevity Survey regarding the self-

					care abilities of the older people, the study estimates the size of the older population requiring LTC between 2015 and 2030, examining the escalating trend in LTC costs while accounting for the influence of price inflation. The findings indicate that the ageing population is anticipated to lead to a twofold increase in LTC expenses by the year 2030.
C12	J. Li	2020	Analysis on the Sustainability of the Financial Burden of Long-Term Care Insurance System in China: Based on the Estimation of 17 Pilot Schemes	Chinese Social Security Review	This study utilizes CHARLS data alongside a comprehensive simulation model to estimate the financial implications of 17 long-term care insurance pilot initiatives in China spanning from 2000 to 2050. It further conducts sustainability and sensitivity analyses to comparatively assess the viability and robustness of these pilot programs.
C13	J. Li and Y. Wei	2017	Analysis of Financing and Treatment Payment of Long-Term Care Insurance System in Shanghai	China Health Insurance	Shanghai's initial efforts in piloting long-term care insurance have successfully diversified nursing services, reduced financial pressure on elderly individuals with disabilities, and promoted the nursing industry's growth. To ensure sustainability and fairness, Shanghai should focus on developing a diversified financing system and improving the cost-sharing mechanism for more comprehensive care and compensation.
C14	Y. Li and P. Guo	2021	Evaluation of Financing Efficiency of Long-Term Care Insurance in Shandong Province Based on DEA	Scientific Research on Ageing	This study seeks to assess the financing efficiency of long-term care insurance across 12 pilot cities in Shandong province, aiming to offer insights for enhancing its effectiveness. Utilising the DEA model, the paper conducts a quantitative evaluation of the financing efficiency within the aforementioned cities.

C15	Y. e. Li and T. Ming	2020	Long-Term Care Insurance Financing Mechanism: Practice, Dilemma and Countermeasures: An Analysis Based on the Policies of 15 Pilot Cities	Financial Theory & Practice	Analysis of long-term care insurance funding policies in pilot cities reveals issues like limited coverage, over- reliance on medical funds, regional funding disparities, and financial sustainability concerns. Recommendations include establishing a social insurance system, expanding coverage, standardising funding, achieving independent funding, and controlling expenditures to improve pilot programs and the insurance system.
C16	B. Lin	2016	A Preliminary Estimate of the Level of Financing for Long-Term Care Insurance in China	Research on Financial and Economic Issues	This article estimates the long-term trend of the required payment rates for long-term care insurance in China based on policy scenarios.
C17	W. Liu and R. Wang	2020	Study on Financing Efficiency of Long-Term Care Insurance in Pilot Cities in China: Empirical Analysis Based on 14 Pilot Cities	Northwest Population Journal	The utilisation of Data Envelopment Analysis (DEA) in conjunction with the coupling coordination model enabled a quantitative assessment of financing efficiency and coordination within long-term care insurance systems. Discrepancies were identified across pilot cities, revealing significant variations in financing levels, efficiency, and a notable misalignment between financing levels, economic development, and population demographics.
E6	B. Lu, H. Mi, Y. Zhu and J. Piggott	2017	A Sustainable Long-Term Health Care System for Ageing China: A Case Study of Regional Practice	Health Systems & Reform	This scholarly article provides an account of the Qingdao Long-Term Care Medical Insurance (LTCMI) program, examining the characteristics of its recipients, the expenses associated with program enlargement, and the factors influencing these costs. Analysis of the recipient composition within the Qingdao LTC system indicates that, based on existing per unit costs, extending coverage to all recipients would incur an expenditure equivalent

					to approximately 0.1% of China's Gross Domestic Product.
E7	B. P. Lu, X. P. Liu and M. M. A. Yang	2017	A Budget Proposal for China's Public Long-Term Care Policy	Journal of Ageing & Social Policy	This research examines the existing disabled status of economically disadvantaged and socially vulnerable older people lacking ample financial means and family assistance. The study concentrates on projecting a safety net public subsidy policy for Long-Term Care (LTC) services in China, employing data from the China Health and Retirement Longitudinal Survey (CHARLS) 2011 wave. The primary contribution lies in forecasting future disability trends and LTC public costs by considering shifts in education, population ageing, and urbanisation, utilising methods such as multinomial logistic regression and simulation.
C18	G. Ma and P. Zhang	2022	Study on the Financing Mechanism of Long-Term Care Insurance in Anhui Province	Journal of Nanjing Medical University (Social Sciences)	This study categorizes insured entities in Anhui Province into urban workers and urban and rural residents, while also stratifying disabled individuals into mild, moderate, and severe levels based on International Labour Organisation (ILO) criteria. Through employing sub-models encompassing population, income, cost, and outcome within the actuarial framework, this paper evaluates the financial adequacy of long-term care insurance in Anhui Province.
C19	G. Ma, P. Zhang and P. Zhang	2022	Analysing the Financing Rate of Long-Term Care Insurance in Anhui Province: A Study Based on the ILO Model	Journal of Suihua University	This study utilizes multiple models from the ILO framework to analyse the financing rate of the long-term care insurance system in Anhui Province. It aims to compute and assess the financial implications of this system.
C20	P. Pan, R. Yan, P.	2021	Empirical Analysis of the Balance of Revenue and	Science & Technology	This study examines the present state of income and expenditure

	Deng and B. Wang		Expenditure of Shanghai Long-Term Care Insurance Fund Based on GM (1,1) Model	and Economy	within the long-term care insurance fund, employing the GM (1,1) model to forecast the balance of the Shanghai long-term care insurance fund spanning from 2020 to 2050.
E8	R. Peng, X. Deng, Y. Xia and B. Wu	2022	Assessing the Sustainability of Long-Term Care Insurance Systems Based on a Policy-Population-Economy Complex System: The Case Study of China	International Journal of Environmental Research and Public Health	To evaluate the sustainability of the Long-Term Care Insurance (LTCI) system in China, this study developed a comprehensive LTCI policy–population–economics (PPE) framework. By analysing 76 LTCI policy documents from 2016 to 2021 in 14 pilot cities, the study employed a Policy Modelling Consistency (PMC) index comprising 9 primary variables and 36 sub-variables, revealing the need for enhanced coordination within the PPE system to foster the development of a sustainable LTCI system.
C21	Q. Song and J. Sun	2020	Is It Feasible for China to Establish a Long-Term Care System for the Elderly?	Review of Economy and Management	Establishing a long-term care system for older population is crucial for enhancing social security, developing care services, reducing family pressure, increasing labour supply, and protecting the rights of disabled seniors. China's ageing policy is evolving, with an emerging care service system, stable funding, cultural traditions of filial piety, and a growing professional workforce, suggesting the foundation for such a system is in place.
C22	L. Sun, G. Feng and H. Mi	2020	Sustainability of Long-Term Care Insurance Fund Expenditures: A Case Study of Qingdao in China	Dongyue Tribune	This study utilizes empirical data spanning from 2012 to 2017 concerning the operational performance of long-term care insurance in Qingdao. It formulates an actuarial framework for fund expenditure and employs predictive modelling techniques to simulate future expenditure patterns.
C23	W. Tang	2021	Research on Different	Journal of	This investigation employed seventh

	and F. Su		Financing Models of Long-Term Care Insurance in China	Finance and Economics	census data and an age shift algorithm to estimate the demographic composition and size of older population with disabilities spanning the years 2020 to 2040. Utilising the actuarial balance theory of social insurance, a dynamic actuarial framework was developed to project the equilibrium premium rates and payment allocations for long-term care insurance among urban employees as well as urban and rural residents over the ensuing two decades.
C24	W. Tang, X. Yu and F. Su	2022	Financing Adjustment Mechanism and Payment Burden of Long-Term Care Insurance in China	Insurance Studies	This article presents a theoretical framework for analysing the financing adjustment mechanism of long-term care insurance. It explores factors such as changes in life expectancy, urban-rural migration, and disability rates, using a long-term actuarial balance model to calculate per capita financing amounts from 2020 to 2050. Additionally, it evaluates financing models and stakeholders under different systems, focusing on individual payment pressure.
C25	Y. Tian	2020	Examining the Financial Affordability of Long-Term Care Insurance in China: A Critical Analysis of the Rationality of the Long-Term Care Insurance System Dependent on Medical Insurance	Social Security Studies	This scholarly investigation examines the financial feasibility of long-term care insurance within the context of China. It assesses the inclination towards acquiring long-term care insurance among urban and rural residents as well as urban employees, while also developing an actuarial framework specific to medical insurance.
C26	Y. Wan	2023	The Construction Logic and Plan Calculation of the Independent Financing Mechanism of Long-Term Care Insurance	Jiangxi Social Sciences	This research employs Shangrao, Jiangxi, as a representative region to assess financing mechanisms, employing the International Labour Organisation (ILO) model to estimate the spectrum of payment rates for

					long-term care insurance between 2025 and 2050. This calculation is based on the principle of fund balance within the pay-as-you-go framework.
C27	X. Wang, Y. Yang and L. Feng	2021	Research on Financing Issues of Long-Term Care Insurance in Rural Areas of China	Social Sciences in Guangxi	This research employs the ILO financing model to determine the payment rate for long-term care insurance in rural regions of China. This calculation is facilitated through four distinct sub-models: the population and economic model, income estimation model, cost estimation model, and outcome model.
C28	T. Wen and J. Kong	2020	Long-Term Care Financing and Public Finance Transition in China	Sub National Fiscal Research	The Chinese government has implemented a series of initiatives aimed at fostering the growth of the eldercare sector and has augmented its financial commitment to eldercare services. Nonetheless, challenges persist, notably in the form of deficient fiscal financing strategies, inadequate funding levels, and inequitable financial frameworks. This study examines these challenges through the lens of a nation striving for energy enhancement.
C29	H. Wu, Y. Shao and T. Zhou	2018	Study on Long-Term Care Insurance Financing Mechanisms – Based on A Comparison of 15 Pilot Programmes across China	Financial Theory & Practice	This article discusses the policy plans of the first batch of 15 pilot cities in terms of financing methods, financing standards, payment methods, and financing channels.
E9	X. Xu and L. Chen	2019	Projection of Long-Term Care Costs in China, 2020–2050: Based on the Bayesian Quantile Regression Method	Sustainability	Utilising distinct empirical approaches within the established framework, this paper employs Bayesian quantile regression (BQR) to investigate future long-term care (LTC) cost escalation. The findings indicate a substantial projected increase in LTC costs, emphasising the imperative need for a rational payment mechanism

					involving individuals, social contributions, and government involvement in the LTC system.
E10	C. Yang, H. Li and R. Zhang	2022	Research on the Contribution Ratio of Long-Term Care Insurance for Urban Workers in Shandong Province Based on the ILO Model	Proceedings of the 41st Chinese Control Conference	The purpose is to scientifically calculate the long-term care insurance contribution ratio in Shandong Province, and provide a reference for strengthening the provincial level system design of long-term care insurance and optimising the long-term care insurance financing mechanism.
C30	H. Yang, W. Fan and W. Jiang	2023	Comparative Analysis of Financing Burden Calculation in Long-Term Care Insurance Funds: Insights from Pilot Plans in 8 Cities	Chinese Journal of Health Policy	This research utilizes macro and micro data to develop a Markov model for predicting the nationwide population of disabled older individuals from 2021 to 2030. It also assesses the financial pressure of implementing long-term care insurance pilot plans in eight cities and explores strategies to improve the financing plan.
E11	W. Yang, S. Chang, W. Zhang, R. Wang, E. Mossialos, X. Wu, D. Cui, H. Li and H. Mi	2021	An Initial Analysis of the Effects of a Long-Term Care Insurance on Equity and Efficiency: A Case Study of Qingdao City in China	Research on Ageing	This article conducts an initial evaluation of a recently introduced long-term care (LTC) insurance in Qingdao City, China, examining its impact on both equity and efficiency in financing. Based on data gathered from 47 in-depth interviews in 2016, the study reveals significant financial pressure disparities among insurance participants, highlighting persistent inequities in access to care despite the intended focus on ensuring fairness.
E12	W. Yang, A. J. He, L. Fang and E. Mossialos	2016	Financing Institutional Long-Term Care for the Elderly in China: A Policy Evaluation of New Models	Health Policy and Planning	Conducting a targeted systematic narrative review of both academic and grey literature, this study identifies and evaluates various models, supported by qualitative interviews with government officials, care home staff, and service users. Among the three models examined,

					the LTC Nursing Insurance emerges as the most favourable policy option; however, the restrictive eligibility criteria have significantly excluded a substantial number of older people requiring care access, highlighting the necessity for future reforms in this regard.
C31	Y. Yang	2019	Exploring the Long-Term Care Insurance System for Financial Sustainability: A Case Study of Qingdao Long-Term Medical Care Insurance	Market Weekly	This study relies on the Interim Measures for Long-term Medical Care Insurance in Qingdao and employs data from the 2010 Sixth National Census to construct a financial actuarial framework for long-term medical care insurance in Qingdao. It endeavours to forecast the forthcoming cash flow trajectory of long-term care insurance funds within Qingdao's established long-term medical care insurance system.
C32	J. Yu	2021	Empirical Analysis of Long-Term Care Insurance Financing Mechanisms at the Provincial Level	Health Economics Research	This study examines the financing mechanism of long-term care insurance across 16 prefecture-level cities within Shandong Province, China, by analysing pertinent regulations. Utilising socioeconomic and demographic factors, a policy evaluation is undertaken to offer insights for the enhancement of the long-term care insurance system's design.
E13	L. Zhang, S. Fu and Y. Fang	2020	Prediction the Contribution Rate of Long-Term Care Insurance for the Aged in China Based on the Balance of Supply and Demand	Sustainability	This study seeks to forecast the contribution rate of Long-Term Care Insurance (LTCI) in China spanning from 2020 to 2050, focusing on the long-term care (LTC) expenses incurred by disabled individuals aged 65 and above. Utilising data from the population census, Chinese statistical yearbook, and the Chinese Longitudinal Healthy Longevity Survey (CLHLS) database, simulations are conducted.

					Employing the International Labour Organisation (ILO) financing model with a fund balance perspective, the study employs an overarching simulation model and Monte Carlo simulation to project the LTCI contribution rate for disabled older people in China from 2020 to 2050.
E14	L. Zhang, S. Fu and Y. Fang	2021	Research on Financing Mechanism of Long-Term Care Insurance in Xiamen, China: A System Dynamics Simulation	Frontiers in Public Health	This study seeks to forecast the evolving trajectory of long-term care insurance (LTCI) funds in China by elucidating the connection between revenue, expenditure, and influencing factors. Utilising data from the Xiamen Special Economic Zone Yearbook and a field survey, the research employs a system dynamics model (SDM) to predict the LTCI funds' changing pattern from 2020 to 2030. Additionally, through literature exploration and expert input, the study identifies intervention objectives and assesses their effects on maintaining the balance of LTCI funds.
E15	L. Zhang, S. Fu, Y. Wang and Y. Fang	2022	Research on the Optimisation of Financing Scheme of Long-Term Care Insurance in China Based on System Dynamics Simulation	Frontiers in Public Health	This research offers policy recommendations for China to create a viable financing mechanism for Long-Term Care Insurance (LTCI), projecting the trajectory of fund balances and evaluating suitable financing approaches. Utilising a System Dynamics Model (SDM), the study elucidates the present scenario and key factors influencing the revenue and expenditure of LTCI funds in China. Additionally, incorporating literature review and expert input, the research identifies intervention objectives and forecasts the evolving trend of LTCI fund balances from 2020 to 2050 under various intervention schemes.

C33	L. Zhang, S. Fu, Y. Wang, L. Yuan and Y. Fang	2022	Optimised Design of Long-Term Care Insurance Financing Scheme in China based on System Dynamics Simulation	Chinese Journal of Health Policy	The investigation of China's long-term care insurance fund revenue and expenditure, alongside key determinants, was conducted utilising techniques such as literature scrutiny and field surveys. Employing the System Dynamics (SD) approach, a model depicting the dynamics of long-term care insurance fund revenue and expenditure was formulated.
C34	S. Zhang and Y. Zhang	2022	Analysis of the Financing Mechanism of Long-Term Care Insurance in China -- Taking the Second Batch of National Pilot Long-term Care Insurance as an Example	Journal of Insurance Professional College	This article compares how the second group of long-term care insurance pilot cities in China finance their programs. It suggests creating incentives for young people to contribute and clarifying the financial responsibilities of different administrative levels.
C35	Y. Zhang	2020	Estimate and Trend Analysis on Financial Burden of Long-Term Care Insurance System in China	Population Journal	This study develops a theoretical framework utilising empirical evidence to explore variations in fund allocations across diverse treatment levels within broad, medium, and narrow benefit categories. It aims to elucidate the determinants of institutional and personal financial pressure, alongside their enduring trajectories.
C36	Y. Zhang and Y. Yang	2019	Construction of Long-Term Care Insurance System Based on Independently Financing: Zheng Zhou Case and Its Innovation	Disability Research	The Long-Term Care (LTC) Insurance System, due to its distinct nature, should be financed independently from other social security systems. In China, however, it relies heavily on Medical Insurance (MI) funds, compromising its independence; the proposed 'Zhengzhou Model' suggests financing through individual contributions and government subsidies, which has proven to be fiscally sustainable in the long run.
C37	L. Zhou and J. Wang	2019	Analysing Long-Term Care Insurance Fundraising and Benefit	Research on Financial and Economic	This scholarly work examines and contrasts the funding strategies and disbursement protocols of long-term

			Payment Policies: A Comparative Study of Implementation Plans in 15 Pilot Cities Nationwide	Issues	care insurance across 18 pilot cities. Emphasis is placed on key facets including the avenues for financing long-term care insurance, the extent of coverage provided, the criteria for financing, the terms for payment, and the magnitude of payment.
C38	W. Zhou and H. Zhang	2022	Analysis of Financing Levels and Demand Satisfaction in 15 Pilot Cities for Long-Term Care Insurance in China	Medicine and Society	Analyse the financing policies of the first batch of 15 pilot cities for long-term care insurance in China, estimate the financing level and its ability to meet the basic life care and basic medical care needs of severely disabled people, and provide a reference for other cities.
C39	M. Zhu and Z. Ma	2023	Research on the Design of a 'Holistic' Approach for Long-Term Care Insurance: Measuring Fund Sustainability based on 29 Pilot Cities	Chinese Social Security Review	Based on the CHARLS data from 2015 to 2018 and China's seventh census data, this article uses the homogeneous Markov process, health state transition probability matrix, and long-term care insurance fund actuarial model to predict the future development trend of long-term care insurance in China.
C40	X. Zhu, B. Chen, Y. Liang and Q. Wang	2023	Research on Financing Level Calculation and Sharing Mechanism of Long-Term Care Insurance in Nanning	China Health Insurance	The ILO financing model was used to calculate the financing level of long-term care insurance in Nanning City, and EViews software was used to conduct a feasibility test on individual responsibility sharing.

Appendix 2 Comparative forecasting performance of GM (1,1), ARIMA, exponential smoothing, and linear regression for insured population

Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Hanzhong	2016	378900	378900	#N/A	#N/A	384132
	2017	381600	385971	382365	378900	382464
	2018	387000	383223	382673	380250	380796
	2019	387700	380494	387375	383625	379129
	2020	371400	377785	387820	385663	377461
	2021	373100	375095	371282	378531	375793
	2022	374200	372424	373081	375816	374125
	MAPE		0.958365	1.1016339	1.53841104	1.1135498
Accuracy			99.041635	98.898366	98.461589	98.8864502
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Guangzhou	2020	5039403	5039403	#N/A	#N/A	5009855
	2021	5023300	4947401	4969394	5039403	4976632
	2022	4827267	4938204	4982965	5031352	4943409
	2023	4884277	4910048	4806649	4929309	4910187
	2024	4942800	4891477	4871530	4906793	4876964
	MAPE		1.0750084	1.8324364	1.54969138	1.15675183
Accuracy			98.924992	98.167564	98.4503086	98.8432482
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Guizhou	2019	37247100	37247100	#N/A	#N/A	37340760
	2020	37188700	37345808	37189423	37247100	37252670
	2021	37350300	37210886	37188746	37217900	37164580
	2022	37271600	37076451	37350050	37284100	37076490
	2023	36765200	36942503	37272722	37277850	36988400
	MAPE		0.3603133	0.5063512	0.48486139	0.41025725
Accuracy			99.639687	99.493649	99.5151386	99.5897427
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Hubei	2019	55625900	55625900	#N/A	#N/A	55817580
	2020	55829800	56023165	55869299	55625900	55831720
	2021	56196900	55941536	55927046	55727850	55845860
	2022	55930400	55860026	56237001	55962375	55860000
	2023	55646300	55778635	55945111	55946388	55874140
	MAPE		0.2328791	0.4090271	0.44907941	0.30160029
Accuracy			99.767121	99.590973	99.5509206	99.6983997
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Hohhot	2020	2340000	2340000	#N/A	#N/A	2340980
	2021	2351000	2346561	2352645	2340000	2345260
	2022	2341000	2349865	2338515	2345500	2349540
	2023	2357600	2353173	2353333	2343250	2353820
	MAPE		0.1888183	0.1190369	0.42292713	0.20279142
	Accuracy		99.811182	99.880963	99.5770729	99.7972086
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Changchun	2020	6425000	6425000	#N/A	#N/A	6343183
	2021	6141283	6190401	6139184	6425000	6299175
	2022	6325500	6227801	6319834	6283142	6255167
	2023	6216900	6265428	6213658	6304321	6211158
	MAPE		0.7812271	0.0586335	2.23188616	1.26216606
	Accuracy		99.218773	99.941366	97.7681138	98.7378339
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Qianxinan	2017	2877400	2877400	#N/A	#N/A	2926079
	2018	2993300	2982839	2994486	2877400	2950114
	2019	2943100	2996939	2930605	2935350	2974150
	2020	3028100	3011106	2977169	2939225	2998186
	2021	3069100	3025339	3012017	2983663	3022221
	2022	3063100	3039640	3080112	3026381	3046257
	2023	3013200	3054009	3056491	3044741	3070293
	MAPE		0.8980156	0.9996905	2.01660118	1.30706565
Accuracy			99.101984	99.000309	97.9833988	98.6929344

Note:

When historical data are limited, the GM (1,1) model is generally more suitable than ARIMA for forecasting long-term population trends. GM (1,1) performs well with very small sample sizes

(as few as 4–5 data points) and does not require the time series to be stationary. It captures underlying exponential or monotonic trends effectively and produces stable forecasts even under data constraints. In contrast, ARIMA models typically require longer time series (e.g., 20–30 observations) for reliable parameter estimation and are more sensitive to short-term fluctuations. ARIMA is more appropriate for short-term forecasts in highly granular or volatile datasets. Given the relatively stable and gradually changing nature of population data, GM (1,1) provides more robust and interpretable forecasts when data availability is limited.

Based on the results presented above, GM (1,1) outperforms the other three models in most cases. However, in the forecasts for Changchun and Hohhot, ARIMA produced slightly more accurate results – though the differences were marginal and practically negligible. This is likely because both cities had only four years of historical data, where ARIMA may benefit from short-term noise fitting rather than capturing a long-term trend. In contrast, for cities with more sufficient historical data, GM (1,1) demonstrated consistently superior accuracy and stability. Therefore, after balancing consistency, robustness, and data limitations, this study adopts the GM (1,1) model as the final forecasting approach.

Appendix 3 Comparative forecasting performance of GM (1,1), ARIMA, exponential smoothing, and linear regression for GPBR

Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Qingdao	2020	125385000000	125385000000	#N/A	#N/A	128643200000
	2021	136830000000	133311000000	137879000000	125385000000	130047200000
	2022	127331000000	133082000000	129029000000	126529500000	131451200000
	2023	133780000000	132853000000	131944000000	126609650000	132855200000
	2024	133930000000	132625000000	131148000000	127326685000	134259200000
	MAPE		1.751139527	1.387445998	4.890888419	2.345711839
	Accuracy		98.24886047	98.612554	95.10911158	97.65428816
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Hanzhong	2020	4918000000	4918000000	#N/A	#N/A	4881800000
	2021	5251000000	5007671407	5350062000	4918000000	5050100000
	2022	4908000000	5192998836	5037893000	4951300000	5218400000
	2023	5260000000	5385184992	4996448000	4946970000	5386700000
	2024	5755000000	5584483708	5243030000	4978273000	5555000000
	MAPE		3.156727405	4.609919298	6.359421996	3.354072408
	Accuracy		96.8432726	95.3900807	93.640578	96.64592759
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Jilin	2019	111695000000	111695000000	#N/A	#N/A	110010069767
	2020	108502000000	108616000000	104902500000	111695000000	110940790698
	2021	114398000000	111084000000	115031200000	111375700000	111871511628
	2022	107484000000	116192000000	107957700000	111677930000	113732953488
	2023	119140000000	118833000000	113894900000	111258537000	114663674419
	MAPE		2.272264393	2.178535248	3.339100179	3.107150519
	Accuracy		97.72773561	97.82146475	96.66089982	96.89284948
Region	Year	Real	GM(1,1)	ARIMA	Exponential Smoothing	Linear Regression (OLS)
Guizhou	2019	176747000000	176747000000	#N/A	#N/A	175340600000
	2020	178680000000	181278000000	184137400000	176747000000	182554700000
	2021	196939000000	188875000000	185849500000	176940300000	189768800000
	2022	188641000000	196790000000	204534500000	178940170000	196982900000
	2023	207837000000	205036000000	195643900000	179910253000	204197000000
	MAPE		2.24324025	5.744286485	7.535779399	2.555705163
	Accuracy		97.75675975	94.25571351	92.4642206	97.44429484

Note:

For Qingdao city, the accuracy of the GM (1,1) model was 0.36 percentage points lower than that of the ARIMA model, while for Jilin province, the difference was 0.09 percentage points. As these differences are less than one percentage point, they are considered negligible in practical terms. Given the advantages of GM (1,1) in handling small datasets and its consistency with the methodological framework of this study, GM (1,1) is regarded as a suitable and preferred choice for forecasting.