

THE STRATEGIC ROLE OF INNOVATION IN ADDRESSING ORAL HEALTH INEQUALITY IN PRIMARY CARE ORGANISATIONS IN ENGLAND

by

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ABSTRACT

This research investigates the interplay between strategy, innovation, oral health inequalities, and the Primary Care Organisation (PCO). There has been little previous consideration of the interplay between these four factors, which this research addresses through a mixed-methods approach combining interviews, secondary-data analysis, and an investigation into the availability of oral health strategies. Analysis was supported by dialectic and functionalist approaches and suggested that structural and process difficulties affected the ability of PCOs to address inequalities in oral health through strategy and innovation. The role of PCOs and consultants in dental public health in relation to strategy and innovation was characterized by contradictions and inconsistencies, some of which appeared to be dysfunctional. The findings raise a number of considerations regarding the role PCOs adopted with regard to oral health inequalities. In particular, this thesis demonstrates that local and macro-level structures and processes may be inadequate to ensure reductions in oral health inequality through strategy and innovation. Integration of strategy and innovation in this thesis leads to a suggested innovation-strategy complex.

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LIST OF ABBREVIATIONS

BASCD	British Association for the Study of Community Dentistry
BDA	British Dental Association
CDPH	Consultant in dental public health
CQUIN	Commissioning for Quality and Innovation
DCP	Dental care professional
DEP	Dental Epidemiology Programme
d3mft	Decayed (visible into dentine) missing and filled teeth (deciduous)
DSRG	Dental Strategy Review Group
GDP	General Dental Practitioner
GDS	General Dental Service
IMD	Index of Multiple Deprivation
JSNA	Joint Strategic Needs Assessment
LAT	Local Area Team
LDN	Local Dental Network
LPN	Local Professional Network
MSE	Multiple search engine
NeLH	National electronic Library for Health
NHS	National Health Service

NHS CB	NHS Commissioning Board
NHSI	NHS Institute for Innovation and Improvement
NICE	National Institute for Health and Clinical (later Care) Excellence
NTAC	NHS Technology Adoption Centre
OHNA	Oral health needs assessment
OHS	Oral health strategy
ONS	Office for National Statistics
PCC	Primary Care Commissioning
PCD	Professional complementary to dentistry
PCO	Primary Care Organisation
PCT	Primary Care Trust
PDS	Personal Dental Service
QIPP	Quality, innovation, productivity and prevention
SHA	Strategic Health Authority
UDA	Unit of dental activity
WHO	World Health Organisation

“Here is Edward Bear, coming downstairs now, bump, bump, bump, on the back of his head, behind Christopher Robin. It is, as far as he knows, the only way of coming downstairs, but sometimes he feels that there really is another way, if only he could stop bumping for a moment and think of it.”

AA Milne.

INTRODUCTION

This thesis examines the strategic role of innovation in addressing oral health inequalities in England at the level of the Primary Care Organisation (PCO). Past research has tended to focus on oral health inequalities, PCOs, strategy or innovation. This thesis examines those domains, but also undertakes an integrative approach to provide a better understanding of interplay between these domains. Additionally, research on PCOs, particularly in their post-2006 framework, has been limited, which is regrettable considering their role in dental public health and commissioning services. This thesis contributes towards filling that gap. In

this thesis PCO means those local NHS bodies extant in England between 2002 and 2013 that were generally known as Primary Care Trusts (PCTs), although some were Care Trusts.

The empirical content of this thesis was undertaken using a mixed-methods approach including interviews, analysis of secondary data, a questionnaire, and an investigation into the availability of oral health strategies (OHS). Empirical research was restricted to England.

Initial research explored variables in relation to oral health inequality and PCO strategies aimed at addressing such inequality. Analysis of results at that stage confirmed oral health inequality and demonstrated possible variation in the ability of PCOs to address this. There also appeared to be unexplained variation in the presence of strategy aimed at addressing oral health inequality across PCOs. At this point the researcher engaged with the NHS emphasis on innovation and decided to explore the role of innovation in PCO strategy to address oral health inequality. It was considered that innovation could be explored as a possible variable in PCOs' addressing of oral health inequality. All research was conducted prior to April 2013, when PCOs ceased to exist. Interviews regarding oral health inequality were conducted between September 2009 and February 2010. Analysis of availability of oral health strategies took place in June 2009, and analysis of secondary data-sets was undertaken in May to October 2009. Interviews regarding strategy and innovation took place between January and August 2011, and a questionnaire relating to strategic innovation was first mailed in March 2012, with final responses received in May 2012. Final interviews, based around individual instances of innovation, took place between October 2012 and March 2013.

The researcher engaged with theory from medical and non-medical disciplines. The main bases were public health, innovation theory, dialectics, organization theory (including where this overlaps with social science), and semantics. The first two are perhaps obvious, but the others perhaps less so. A dialectic approach, a method to analyze contradictions, tensions and inconsistencies, was engaged after findings indicated that contradictions and inconsistencies were present. The author is unaware of previous use of a dialectic approach in dental research. Organisation theory assisted in understanding the PCO as an organization, including its strategy development, and allowed discovery of the role for functionalism in the analysis of dialectical findings. Semantics was engaged as it became clear that the words innovation and strategy both had varied meanings. Studies 2-4 were undertaken when radical NHS change was imminent. In order to retain focus, analysis of the impact of forthcoming change was restricted to its effect on strategy and innovation. Donabedian's (1) concept of structure, process and outcome relating to quality in health care is also used in this research.

Oral health inequality, and the role of PCOs in addressing this, featured prominently in official publications prior to this thesis and during its preparation. Such publications also emphasised the role of local-level strategy and innovation in addressing inequality. There has been policy aimed at both access inequality and oral health inequality; which issue is being addressed by a particular policy is not always explicit or the two issues may be conflated. Because inequality in access is related to oral health inequality, as no access means no diagnosis, treatment or professional application of preventive measures, this thesis relates to both of these inequalities. However, equality of access is impossible as it would imply equal distance, time and expense for each individual in society at all times. Equality in oral health is impossible unless universal absolute health for all was achieved, and assuming

that absolute health could be defined. Reducing inequality may therefore be a better objective than creating equality. However, reducing inequality does not necessarily correlate with improving health or access. Inequality may also be reduced by a worsening condition of better-off population groups whilst that of the worst-off groups remains static. Health inequality reduction therefore may be a competing goal against absolute improvements in health or access (2). The concept of inequity, as opposed to inequality, is defined as inequality that is deemed to be unfair or stemming from a form of social injustice (3). Inequalities may or may not be inequitable; it might be a matter of poor luck (3). Identification of inequities depends on one's theories of justice and society and how one believes inequalities are generated (3). In this research the term inequality is favoured over inequity since it lends itself better to measurement and avoids the influence of moral judgement.

The study of inequality is related to the subject of deprivation. Deprivation is variably defined but can spring from poverty where poverty is defined as a lack of income or financial resource. People can be materially deprived when they have a “...*lack of the goods, services, resources, amenities and physical environment which are customary, or at least widely approved in the society...*”(4).” They can be socially deprived where they have “...*non-participation in the roles, relationships, customs, functions, rights and responsibilities implied by membership of a society and its sub groups* (4).”

High Quality Care for All – NHS Next Stage Review Final Report (2008) (5) indicated a desire “...to foster an enterprise and innovation culture....” in the NHS and emphasized support and reward for innovation. This report also stated:

- “*Strategic health authorities will have a new legal duty to promote innovation.*”
- “*We must support innovation to foster a pioneering NHS.*”
- “*The next stage in achieving high quality care, requires us to unlock local innovation....*”

The NHS Operating Framework 2009/2010 stated: “*We need a new enabling approach to leadership, which encourages innovation....*” (6). These documents (5,6) indicate that there was a will at national level for local and regional innovation. The use of the terms “*promote*”, “*enabling*”, “*support*”, “*foster*” and “*unlock*” demonstrates that a reliance on innovation developing by chance was being considered as insufficient. The quotations above indicate, conversely, that there was to be some planning for innovation.

In this research innovation is taken to include devices, systems, policies, programmes, products or services that are derived from elsewhere as well as those that are invented by the PCO, an approach consistent with academics in the field of innovation (7,8) although some academics exclude invention from the concept of innovation (8). Inclusion of inventions also removes the difficulty of having to make distinctions in a grey area where something that is adopted but modified could represent an invention instead of an innovation.

Because this thesis analyses innovation at PCO-level, such innovations were expected to be non-technological. This turned out to be the case. Interview participants did not refer to any

mandatory implementations, such as might be dictated by the centre, which was advantageous as these would have shed less light on structure and process factors relating to innovation at PCO-level. Partners are referred to in this thesis, and these are individuals, groups (including the public), or organisations that were separate from the primary adopting or implementing organisation. This thesis does not focus on the effectiveness of particular innovations and provides no guidance on which innovations to implement. Guidance on this is available elsewhere (9,10,11) In this thesis the term innovation can sometimes be interchangeable with the terms programme and intervention where these refer to new approaches, consistent with the approach taken by Durlak and DuPre (2006) (12)

Whilst the researcher recognises the importance of addressing the concerns of particular vulnerable groups, including old people, individuals with learning or physical disabilities, ethnic groups, prisoners, travelers and the homeless, the focus of this thesis is on mainstream services. This thesis relates mainly to the most common dental problems in England, which are caries and periodontal disease. Survey data in the literature review principally reflect information available when the empirical component of this thesis commenced in 2009. The researcher has added updates for comparison where relevant.

In connection with this thesis, the researcher offered assistance to The British Association for the Study of Community Dentistry (BASCD) in developing a web-based repository for innovation-related knowledge-sharing. This facility was not developed and material related to this is contained at Appendices 16-21.

Bazian Ltd. (2013) (13) investigated barriers and facilitators to implementing “...community-based oral health improvement programmes and interventions.” This was based on analyzing publications and produced findings consistent with this thesis, including the roles of resources, partnership working, and ongoing support. This thesis, however, analyses the wider innovation process and provides specific research on strategy and innovation to address oral health inequality.

The researcher is a general dental practitioner. The PCO with which he had a performer number was not included in the interviews. This PCO was known not to have a consultant in dental public health (CDPH) so would not have been represented in the questionnaire. The research was funded solely by the researcher.

This thesis comprises fifteen chapters, with chapters one to four forming the literature review. Chapter one describes the key concerns of health and oral health inequalities. Chapter two examines the PCO and its relationship with oral health inequality, including through strategy and interaction with general dental practice. Chapter three describes the modern development of primary care dental services, followed by an analysis of service provision and uptake, and concluding with an update regarding relevant changes arising from the 2013 NHS reorganization. Significant attention is paid to primary dental services because of the role of PCOs in commissioning and contracting these services, with the consequent potential for PCOs to address oral health and access inequality through these activities. National variables relevant to inequalities, such as contract frameworks or workforce planning, are discussed briefly to provide context. Chapter four analyses the subject domains of strategy and innovation, including how they relate to PCOs. Chapter five

provides the rationale for the research, based on the literature review, followed by the research aims and objectives. Chapter six provides background for the methodology used for the empirical part of this research. The components of the empirical research are then presented separately as discrete studies across chapters seven to twelve. Chapter thirteen provides a discussion. Integration, where appropriate, is achieved at this stage by exchanging the focus on inequalities, strategy and innovation to a focus on local and national levels. Such integration also permits a break away, where appropriate, from the compartmentalization of the stages of innovation. As Van de Ven *et al.* indicate, innovation is often more complicated than such compartmentalization might suggest (14 p. 23). In chapter fourteen limitations are discussed. In chapter fifteen, conclusions are drawn, recommendations provided, and possible areas for future research are indicated.

Through this research the author wishes to improve the understanding of how the innovation process works at the local level, in particular in relation to addressing oral health inequality. The researcher anticipates that some findings will be applicable to the NHS framework post-April 2013, because the emphases on both innovation and addressing health inequality appear to remain similar at the time of writing (January 2015). Instances of innovation will continue to occur, sometimes in unlikely places. The author hopes that this thesis will assist in making the most of these instances.

The research aimed to establish the strategic role of innovation in addressing oral health inequality in primary care organisations in England. In order to do this, a review of the literature was conducted based around the core domains of inequalities in oral health, strategy, innovation, and primary care organisations.

CHAPTER 1: INEQUALITIES IN HEALTH AND ORAL HEALTH

1.1 Inequalities and health

In 1971 Hart suggested that there was an “*inverse care law*” (15) where those most in need of health services had lower availability of good quality care. More recently, associations between deprivation and health were detailed in the Black report (16) in 1980 and in the update to this report, The Health Divide (17) in 1987. The Acheson report (18), in 1998, repeated many of the Black report’s recommendations and found a continued association between social class and morbidity and mortality. Further associations between socio-economic status and morbidity or mortality were noted by research in 1974 (19) and 1991 (20) based on the Whitehall studies, and by research based on The Longitudinal Study (21), carried out by the Office for Population Census and Surveys (22) and subsequently by the Office for National Statistics (ONS). Later research continues to demonstrate an association between socio-economic status and mortality (23,24) and morbidity (25). Poorer perceived health also appears to be associated with lower socio-economic status (26,27). Addressing social determinants for health lies with policy outside of health but, importantly, indicates a role for cross-working between different policy areas (28). Many risk factors are based on the financial status of individuals and families, either directly, as in low pay and unemployment (29), or indirectly such as housing, education, overcrowding, lack of access to transport and poor diet.

Much research has investigated associations between income and health. The absolute income hypothesis suggests that health improves with rising income, independently from what others earn (3,30). However, relative incomes have also been viewed as important to health (3,20). In addition, associations have been described between income inequality of a society (as opposed to just income, absolute or relative) and health of that society, possibly mediated by factors such as a sense of injustice, negative psychosocial environment (31), social distrust or reduced social cohesion (32). An international study has shown that income distribution had a significant effect on life expectancy whereas Gross National Product per capita did not (33).

Low socio-economic status in early childhood may have an impact on health in later life independent of later socio-economic status (34). This is consistent with an accumulation model of the impact of socio-economic status on health (34). Others have hypothesized that changes in, or instability of, socio-economic status may be factors impacting on health (35). There has also been debate as to whether deprivation invites poor health or whether poor health increases the risk of deprivation (36,37). In the ten years to 2009 overall health had improved but health inequalities between social classes had widened (38). A King's Fund report (2012) found that although the proportion of the population in England that engaged in multiple unhealthy behaviours had declined between 2003 and 2008, these reductions were mainly seen in higher socio-economic and higher educational groups (39).

There are cost implications to reducing inequalities if this is to be achieved by raising the standards of the lowest. Crossman, Secretary of State for Health and Social Security 1968-1970 stated in 1972: *“I can only equalize on an expanding budget (40).”*

1.2 Oral health

Oral health is considered to be part of general health, as illustrated by the WHO (2003) statement that: *“Oral health means more than good teeth; it is integral to general health and essential for well-being (41).”* In 2005 the 8th World Congress on Preventive Dentistry produced the *Liverpool Declaration* (42) stating that *“...oral health is an integral part of general health and well-being and a basic human right”*.

There has been a shift in emphasis to a social definition of health, promoted by the Canadian report by Lalonde in 1974 (43) and supported by the Black report (16) in 1980, and the Acheson report (18) in 1998, in Great Britain and England respectively. The World Health Organisation (WHO) uses this wider definition of health, as illustrated by the WHO Declaration of Alma-Ata (1978) (44), which stated that health *“...is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.....”* The WHO maintained this social concept of health in 1986 in its *Ottawa Charter for Health Promotion* (45). In 2005, The WHO stated in their *Bangkok Charter* (46) that health promotion was based on the following right: *“The United Nations recognizes that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without discrimination.”*

Nadanovsky and Sheiham (1994) suggested that caries reduction in the 1980s was possibly due more to changing social factors than dentistry (47). This is consistent with McKeown's (1979) suggestion that we may over-estimate the impact of healthcare on disease (48).

1.3 Oral health inequality

1.3.1 Children

A study in Scotland by Sutcliffe (1977) found a difference in caries experience that was *"...partially accounted for by the different standards of oral cleanliness found between the deprived and non-deprived areas. In the deprived areas there was a trend towards a high caries experience which was independent of the standard of oral cleanliness (49)."*

Associations between deprivation and caries were observed later in England by Prendergast *et al.* (1997) (50) and Provart and Carmichael (1995) (51). Freeman *et al.* (1997) found that parental unemployment was an important risk factor for caries in 5-year-olds (52). Schou *et al.* (1991), using free school meals as a proxy for deprivation, found an association between deprivation and unfavourable dental health behaviour (53). Addy *et al.* (1991) found an association between social class and tooth brushing frequency (54), and Eckersley and Blinkhorn (2001) found associations between deprivation and the supply to infants of sugary drinks in baby bottles, brushing frequency, parental supervision of brushing and attendance patterns (55). Jones *et al.* (1997) associated caries and deprivation, whilst also noting the greater benefit of fluoridation in deprived areas (56). Further studies also support an association between deprivation and oral health (57,58,59).

Data from the 2003 Children's Dental Health Survey (60) showed an association between socio-economic status and reported oral problems (61), and also an association between social class and tooth brushing frequency (62). Maliderou *et al.* (2006) found an association between social class and sugar consumption in children (63).

Marcenes and Murray (2001) examined the association between trauma and social inequality and concluded that “...traumatic dental injuries seem to be a serious dental public health problem among children in deprived areas...(64).” An association between socio-economic status and malocclusion was demonstrated in one study (65) but not in another (66).

The *National Dental Epidemiology Programme for England: oral health survey of five-year-old children 2012* (67), published after the empirical component of this thesis that investigated inequalities, revealed wide variation in both the prevalence and severity of decay across the country. However, Dental Epidemiology Surveys from 2008 onwards cannot be reliably compared with earlier surveys because of a change in methodology (67). Although the mean percentage of the sample with d₃mft of at least one was 27.9% in the 2012 study, there was a range at upper tier local authority level of 12.5% to 53.2%. Although mean d₃mft was 0.94, there was a range at upper tier local authority level of 0.35 to 2.1. The survey found that severity of caries correlated well with deprivation (IMD 2010), with an R² value of 0.448 when taking the data at lower tier local authority level (67).

1.3.2 Adults

The General Household Survey data on oral health have shown a strong association between the prevalence of edentulousness and socio-economic group (68). For example, in 1993, for the age group 55-64, four per cent of the professional group and thirty nine per cent of the un-skilled manual group had no natural teeth. In the age group 45 –54 the difference was even wider with a fifteen-fold differential. The data also demonstrated that 64% of professionals reported regular dental visits as compared to 38% for unskilled manual workers in 1993. Data from the 1998 Adult Dental Health Survey (69) demonstrated an association between social class and edentulousness (70) and an even stronger association between educational attainment, a possible proxy for socio-economic status, and edentulousness (71). Further analysis of data from the 1998 Adult Dental Health Survey (69) found an association between social class, number of teeth, and also the number of sound and untreated teeth a person had (71). An association between healthy eating and social class has also been demonstrated (72). Official figures (73,74) show an association between household income and sugar and preserves consumption.

An association between socio-economic status and periodontal disease has been demonstrated (75,76), including by analysing data from the 1998 Adult Dental Health Survey (69,77). Another study based on the 1998 Adult Dental Health Survey did not show a link between periodontal disease and social class, although it did for educational attainment (71). However, this was based only on loss of attachment of 4mm or more. An international study concluded that “...*chronic destructive periodontal disease would seem to be the oral disease which most clearly reflects differences in SES* [socio-economic status] (78).”

Marshman *et al.* (2012) found that perceived access or perceived treatment need was a stronger predictor of oral health impacts than was deprivation, using an area-based composite measure of deprivation (79).

The following inequalities are apparent from the 2009 Adult Dental Health Survey(80), published in 2011, after the empirical component of this thesis that investigated inequalities. Prevalence of edentulousness ranged from 9% in West Midlands SHA to 2% in South Central SHA. The proportion of dentate adults with periodontally healthy sextants (pocketing and loss of attachment less than 4mm), with no calculus or bleeding, ranged from 36% in East of England SHA to 9% in West Midlands SHA. The percentage of adults with any carious teeth ranged from 21% for South East Coast SHA to 39% for West Midlands SHA. Moderate anterior tooth wear in dentate adults was recorded to be 33% for West Midlands SHA and 9% in North West, East of England and South Central SHAs.

1.4 Central policy and strategy to address oral health inequality 1976- 2003

Between 1976 and 1979 a Royal Commission reviewed NHS dentistry and found that the service was “...*saved from breakdown only because the demand for treatment was much lower than the need* (81).” The Dental Strategy Review Group (DSRG) was set up in response to the Royal Commission’s findings and its report, *Towards Better Dental Health – Guidelines for the Future* (1981) (82) addressed a range of perceived problems, including inequality in the distribution of dental services. This unequal distribution was noted by the

National Audit Office in 1984 (81) and the Committee of Public Accounts in 1985 (83). The latter committee observed that a reliance on “*market forces*” to correct the imbalance had produced little progress and called for the introduction of “*incentives and other experimental schemes*” (83). In evidence to this committee (83) the BDA suggested dentists may have avoided some geographic areas because of a fear that NHS fees might rise too high for many to afford. Measures introduced to address access inequality had included facilities in health centres, but by 1983 only a small number of dentists were employed in these locations (81). The BDA, with government approval, published a list of areas where dentists’ earnings were higher, with a view to attracting graduates to areas with fewer dentists (81). The 1986 green paper *Primary Health Care: An agenda for discussion* (84) contained many aspects of the DSRG report’s recommendations and this was followed in 1987 by *Promoting Better Health: the government’s programme for improving primary health care* (85). In this document the government stated that they would promote a wider availability of dental treatment, and recognised a role for water fluoridation in deprived areas. Financial assistance to establish practices in designated areas was to be introduced, and a new contract was to be discussed, an aim of which was to increase the availability of dentists. In 1992 the *Final Report of the Inequalities Task Group* of the Modernising NHS Dentistry Steering Committee (86) stressed the use of “*common risk factor approaches*” and targeting of socially deprived groups. They also suggested: “*HA [Health Authority] performance standards could be linked to inequality reduction not just access*”. They also suggested that inequalities could be reduced by “*training in a community setting*” and “*recruitment from local communities*” as well as providing training in “*cultural and social awareness*” (86). The 1993 House Of Commons Health Committee report on dental services questioned whether access was equitable, and concluded that “*the present organisation and distribution*

of general dental services is failing to address the inequities in oral health” (87). This committee also concluded that inequalities in access and oral health must be addressed in the forthcoming oral health strategy, and that to maintain access the causes of the then current dispute with dentists must be identified and remedied. The committee called for regular data collection on access to services for that part of the population not registered with a dentist. The government response to the Health Committee (88) stated that social and geographical disparities in oral health would be taken into account in the forthcoming oral health strategy. In 1994 The Department of Health published an Oral Health Strategy for England (89). This did not explicitly acknowledge inequalities although it did state the need for “*properly targeted care*”.

In 1999 the prime minister, Mr Blair, stated that within two years, access to an NHS dentist would be available to anyone who wanted it. This was followed in 2000 by *Modernising NHS Dentistry: Implementing the NHS Plan* (90), which stated that NHS dentistry should share a core principle of the NHS Plan which was to “*work to reduce health inequalities.*” This document (90) was explicit in recognising inequalities and a need to address them: “*Poor oral health is associated with economic deprivation and social exclusion. We need further action to continue the general improvement and tackle the inequalities that persist.*” The document (90) also stated that by September 2001 any person who needed NHS dentistry would be able to source it via a telephone call. Solutions cited were Dental Access Centres, using NHS Direct to connect patients with dentists, assistance for expand practices, and encouraging dentists to stay in the NHS (90). A new Dental Care Development Fund was mentioned, which would provide finance to Health Authorities with relatively poor access to dentistry (90). This was in addition to the Investing in Dentistry scheme which was

already available to expanding or new practices in areas with poor access (90). The publication *NHS Dentistry: Options for Change* (2002) (91) included an emphasis on reducing oral health inequality.

In 2003 the Health and Social Care (Community Health and Standards) Act (92) was passed, although it only became effective from April 2006. Under this Act each PCT was to become responsible for commissioning dental services.

1.5 Central policy and strategy to address oral health inequality from 2003 to May 2010

Access improvement was suggested as a goal in official documents including *NHS dentistry: delivering change* (2004) (93), *Choosing better oral health: an oral health plan for England* (2005) (94) and *Further government response to the health select committee report on dental services* (2009) (95).

Addressing oral health inequality has been emphasised in official documents including *NHS dentistry: delivering change* (2004) (93), *Choosing better oral health: an oral health plan for England* (2005) (94), and *Health inequalities: progress and next steps* (2008) (93,96). In 2005 the Chief Dental Officer stated a need “... *to build a service that improves oral health and addresses oral health inequalities* (97).”

In *A Manifesto for the Care Quality Commission* (2008), improved access to health care was cited as a success criterion (98). The *Further government response to the health select*

committee report on dental services (2009) (95) indicated government acceptance that improvements in access to dentistry had been disappointing, with 70% of PCOs having not improved access to dentistry since April 2006, and that there was an intention to develop a better access metric. This response (95) also announced a review of dental services by Steele, and the development of a national dental access programme. In addition, the response revealed that SHAs had indicated to government that they aimed to provide dental access to anyone seeking “*help*” by March 2011 (95).

A 2007 BDA study showed that a large majority of participating dentists thought that the 2006 dental contract had not improved access to NHS dentistry (99). This was also the view of the 2007/2008 House of Commons Health Committee (100). In addition, Batchelor (2008) pointed out that gaining access to a practice providing NHS dentistry may not necessarily equate with gaining access to NHS treatments (101).

In 2009 the House of Commons Health Committee produced its report on health inequalities, which was critical of a lack of evidence-based policy and piloting across healthcare (38), along with criticisms on monitoring and measurement (38). Nor did they see any evidence that “*World Class Commissioning*” (102) would impact on health inequalities in the near future (38).

Beyond England, Childsmile has been running in Scotland since 2006 (103) and aims to reduce inequality in dental health and access to services (103). Childsmile comprises a “*core programme*”, which includes daily tooth brushing in all nurseries and tooth brushing sessions in targeted primary schools (103). In addition, there is a targeted school and nursery

fluoride varnish programme (103). All newly born children in Scotland are connected to Childsmile via their health visitor (103). Childsmile is integrated with primary care dental practice (103), with payments to dentists for providing fluoride varnish to Childsmile enrolled children (104). Macpherson *et al.* (2013) stated that the observed improvement in oral health and the reduction in oral health inequalities in Scotland was “*likely*” and “*to a large extent*” to be due to the Childsmile programme (105).

1.6 Central policy and strategy to address oral health inequality after May 2010

In May 2010 a coalition government came to power in the UK. This government was to have a profound effect on the way the NHS was organized (106).

Equity and excellence: liberating the NHS (2010) stated: “*The [NHS Commissioning] Board will have an explicit duty to promote equality and tackle inequalities in access to healthcare* (107).” Subsequently, the government published *Healthy lives, healthy people: our strategy for public health in England* (2010), drawing attention to worsening health inequalities and announcing the creation of Public Health England (108).

The Operating Framework for the NHS in England 2011/12 (109) stated that the NHS Commissioning Board would be responsible for “... *reducing inequalities in access to healthcare, in cooperation with Public Health England.*” *Developing the NHS Commissioning Board* (2011) (110) stated that an important function of the NHS

Commissioning Board would be “...*the reduction of inequalities in all its activities.*”

Securing excellence in commissioning primary care (2012) indicated that reducing health inequalities would be an ambition for new commissioning arrangements (111). The 2012 and 2013 editions of the NHS Constitution emphasised (112,113), like earlier editions, that there should be a focus on reducing health inequalities.

Watt and Sheiham (2012) argued that “*legislative, regulatory and fiscal policies and controls*” could be used to create “*supportive local environments*” to maintain oral health (114). This was part of their larger argument that dental policy makers had interpreted the common risk factor approach “*too narrowly*” in not extending it to “*the broader shared determinants of chronic diseases*” (114).

CHAPTER 2: THE PRIMARY CARE ORGANISATION

2.1 The PCO

The accountable body for local NHS decisions was the PCO board, comprised of executive and non-executive directors, and based on a corporate board model (115). PCOs were given statutory functions in dental public health (116). PCOs were established in 2002, but in 2005 the government announced that they were to be restructured (117). As a result, in 2006, the number of PCOs was reduced from 303 to 152. Part of the rationale was to improve coterminosity with local authorities (118).

Wade *et al.* (2006) criticised the suitability of the corporate structure for delivering healthcare (119), with additional criticism directed at the possibility of insufficient involvement of clinicians (119,120) and possible deficiencies in accountability and responsive to their populations (121). PCOs ceased to exist at April 2013.

2.2 Oral health strategies and related PCO documents

The Functions of Primary Care Trusts (Dental Public Health) (England) Regulations (2006) emphasized the role of PCOs in oral health promotion, needs assessments and primary care strategy (122). OHSs allowed PCOs to attempt to address access and oral health inequalities as required by various government documents, including the Core Standards C18 and C22 of the Healthcare Commission (2008) (123), superseded by the Care Quality Commission in 2009. Competencies 2 and 6 in the Department of Health document *Achieving the*

Competencies; practical tips for NHS commissioners (2008) (124) specifically related to reducing health inequalities.

The 2008/09 NHS Operating Framework stated: “*PCTs also need to ensure robust commissioning strategies for primary dental services, based on assessments of local needs and with the objective of ensuring year-on-year improvements in the number of patients accessing NHS dental services* (125).” The requirement for such a commissioning strategy based on local need (126) was reiterated in the 2008 Department of Health document *Commissioning Primary Care Dental Services: Meeting the NHS Operating Framework Objectives* (126). It was suggested that such a plan be “...*reviewed at least on an annual basis but is also adjusted where new evidence comes to light* (127).”

World Class Commissioning (2008) stated a requirement for PCOs to have strategies “...*reflecting their priorities over a five year timescale. These plans will be refreshed annually and rewritten every three years* (102).” For dentistry, there should have been “...*a clear strategic commissioning plan...* (128).” Dental strategies should have had: “*Board level ownership...*(128).” The main functions of the PCO board were stated to be “...*to set the strategic direction for the PCT and to exercise effective oversight and management* (102).” A commissioning strategy based on local needs was further emphasized (125,126,129).

PCOs had to undertake “*Oral Health Needs Assessments*” (OHNAs) (129), on which OHSs were to be based. OHNAs may have been based on deprivation indices (129), screening for

caries in children locally (130,131,132), census data (129), national survey data (129), PCO health and lifestyle surveys (129) and PCO health equity audits (129).

Chestnutt *et al.* (2014) confirmed that OHNAs had been developed using a wide variety of approaches and stated: “*Virtually no two documents were the same, either in content or format* (133).” However, Chestnutt *et al.* also stated: “*The concept of a one-size fits all OHNA is flawed...* (133).” Chestnutt *et al.* (2014) also found that it was often unclear how OHNAs fitted into commissioning plans and that there was no research describing how an OHNA was advanced by a strategy and subsequently implemented and evaluated (133).

PCOs had limited control over social determinants without liaison with other public bodies, and a need for such relationships was also being argued from an accountability and legitimacy point of view (115). Joint Strategic Needs Assessments (JSNAs) between PCOs and local authorities were intended to provide this link (134). The Local Government and Public Involvement in Health Act (2007) placed a duty on PCOs and local authorities to undertake a JSNA to identify health needs of populations (135), and outcomes of JSNAs were to include reductions in health inequalities (134). Vital sign components were referred to as a key focus of JSNAs (134). Access to primary dental services based on assessments of local needs was a vital sign, but reduction in oral health inequality was not (136). However, JSNAs are not restricted to vital sign components and dental decay was included in the core data-set (134). Access to dentistry was included in some JSNAs (137,138,139). In 2012, the responsibility for developing JSNAs, along with Joint Health and Wellbeing strategies, fell to Health and Wellbeing Boards, which are committees at upper-tier local authorities (13,140)

2.3 The PCO and oral health inequalities

In 2002 *NHS Dentistry: Options for Change* (91) was published and included the following statements:

- “*Primary Care Trusts should commission such services as are necessary to secure access...and to improve oral health and address inequalities.*”
- “*Furthermore, the new service should allow the dental team... to tackle the serious oral health inequalities, particularly in children.*”
- “*PCTs through their Health Improvement and Modernisation Plans (HIMPs) will be making significant improvements in oral health and the reduction of oral health inequalities.*”
- . “*These issues [access and oral health inequalities] could be more easily addressed if NHS dental services were locally commissioned.*”
- “*Improving access to NHS dentistry...in every community will reduce oral health inequalities.*”

The Audit Commission, in 2002 (141), was critical of the then current NHS dentistry arrangements. One of its recommendations was that PCTs should “...*focus effort on improving dental health, and access to continuing care for the worst health, in the most deprived communities*”. Under *The Functions of Primary Care Trusts (Dental Public Health) (England) Regulations 2006* (122) PCTs (Care Trusts are not specified in these

regulations) were to undertake oral health promotion programmes, school inspections and oral health surveys.

Choosing Better Oral Health: an Oral Health Plan for England, (2005) (94) emphasized addressing inequalities and suggested a “*targeted population approach*”, with local authorities and PCOs sharing responsibility to improve oral health by: “*Identifying local oral health needs and targets to reduce inequalities.*” Such targets might have been focused on “... *disadvantaged communities where the prevalence of disease is above the national average.*” The document (94) stressed the importance of oral health to the Local Delivery Plans of PCOs, which should have actively targeted inequalities, and the roles of Regional Public Health Groups and CsDPH in addressing inequalities were emphasized.

2.3.1 Local-level policy and strategy aimed at oral health inequality

At PCO-level there were published ambitions to address oral health inequality (142,143), with a variety of approaches taken by PCOs. Gifting of brushes and/or toothpastes to those considered deprived occurred as an extension to the centrally-funded *Brushing for Life* programme, which ended in 2006 (144,145), as well as assistance being provided to schools for oral health promotion (145,146). Oral health promotion projects in Sure Start areas (144,145,146), Childrens’ Centres (146) and residential homes were seen as desirable (130), as was oral health training for nursery nurses (130) and working with schools (146,147). A targeted fissure sealant and fluoride varnish programme had been suggested for deprived areas (130). Mobile units were providing access in deprived areas (143,148). PCOs stressed a multi-agency approach to oral health improvement (130,146) alongside a desire to better integrate with the rest of the NHS (131) and to develop better public engagement (131,145).

A PCO had been part of a group that adopted and implemented an oral-health specific Health Equity Audit (149). One PCO had indicated that because almost their whole area had poor dental health, addressing inequality had not been particularly relevant (144).

2.3.2 Local-level policy and strategy aimed at access inequality

Locally available dental care for deprived communities has been stressed as important (150,151,152), although what is meant by local is sometimes not defined (150). Maunders *et al.* (2006) found that dental practice location may affect access inequality (153). Research has shown that there are factors other than distance that may be important determinants of dental attendance in deprived populations (154) such as the social environment, dental anxiety and the perceived value of saving teeth (155). Opportunity or time cost for attending services may continue to apply for deprived individuals, even if financial cost has been removed (156). Concern regarding the distribution of dentists in relation to the distribution of dental disease (483,484) and population distribution (157) has been raised. However, increased provision in deprived areas might only improve availability to those who already access dental services elsewhere (158). Local provision alone may therefore be insufficient to increase dental attendance of the most disadvantaged (158).

At PCO- level there were ambitions to reduce inequalities of access to dental care (143,146, 159). The addressing of inequalities in access to dentistry was sometimes implied by the setting of acceptable distances of services from citizens (160) or a desired dentist/population ratio (143). Although access inequality was often referred to in relation to deprived areas in PCO documents (161), PCOs may have aimed to meet demand wherever it existed (146). The removal of access inequality by providing 100% access for all who wanted it was stated

(131). However, targeting deprived areas does not take into account that many poor people live outside of deprived areas (162).

Dental Access Centres, with an associated helpline through which appointments could be booked, were developed for both urgent and routine care for individuals who might otherwise be unable to gain access (163). Focus groups and surveys were used to try to understand barriers to access in populations (164) and social marketing techniques were used to attempt to change public perception about access to dentistry (165). There was funding for a dentist speaking local languages to improve access (143), and “community connectors” were to be trained to encourage regular visits to a dentist (164). Mobile surgeries were used, with local community engagement, to improve access, including acceptability (143). Outreach training facilities (146,161) have been seen as a potential way to recruit dentists to an area that might otherwise attract insufficient dentists (147). Calls to a patient helpline had been recommended to identify areas for commissioning (145). At SHA level it was suggested that more resources be channeled to PCOs with access shortages (166).

OHNAs are largely based on spatial analysis which, although important (167), may inadequately incorporate travel logistics (168), or be insensitive to the quality or viability of existing practices (169). The Modifiable Areal Unit Problem (485,486), caused by artificial boundaries imposed on continuous geographic phenomena, may pose a validity threat. There is also patient flow across boundaries (170). In a medical setting a significant disparity between area of residence and area of obtaining care has been demonstrated (171).

Various factors might override proximity in the choice of service (172). American medical patients in a deprived area bypassed local facilities to access care in a more familiar setting (172). Another American study, based on physicians, found that need better predicted usage than distance and travel time (173). The effect of distance may be greater for preventive services, even over half a mile (174). Maserejian *et al.* (2008), in another American study, found that, for urban children only, “...each additional mile doubled the odds of utilization (175).”

2.4 The PCO, general dental practice, and inequalities

Under the 2003 *Health and Social Care (Community Health and Standards) Act*, effective from April 2006, each PCO was responsible for commissioning dental services “...to the extent that it considers necessary to meet all reasonable requirements (92).” The chain of command was from the Department of Health via SHAs to PCOs.

At PCO-level, staff inexperience, variable commissioning skill, restrictions entailed by historical financial allocations, and inadequate data for commissioning new services, were noted by the House of Commons Health Committee (2008) (100). The unpreparedness of PCOs to implement the 2006 dental contract had been indicated by The Committee of Public Accounts (2005) when they stated that they were “...extremely concerned that in this vital area of services to the public the Department required Primary Care Trusts to take over the management of the new contracting arrangements without ensuring that they had the necessary expertise and resources (176).” The National Audit Office (2004) indicated potential difficulties for PCO dental commissioning owing to lack of experience and limited

capacity (177). PCO help-lines and NHS Direct were given a role in trying to match demand for dentistry with capacity (178). However, monitoring of whether patients referred to dentists received care may have been lacking (176). Citizens Advice Bureaux also highlighted variable functionality of, and appropriateness of advice from, PCO help-lines (179), and criticised PCOs for limited accessibility of information, recommending other measures such as posters to raise awareness of help-lines (179).

Provision of services may be assessed financially. General Dental Service (GDS) spending as a proportion of NHS spending fell from about 10% of gross NHS expenditure in 1949 to under 4% in 1999 (180). In 2003/4 funding for primary dental care was approximately 1.4 billion pounds (including £0.5 billion patient charge revenue) (177). Central funding for 2008/09 for dentistry was increased by 11% (125), with primary care dental funding ring-fenced until 2012. Central funding to PCOs for primary dental care was based on pre-2006 funding levels (100); a new allocation arrangement for funding PCOs to deliver primary dental care was planned, as announced in 2009 in *NHS Dental Services in England. An Independent Review led by Professor Jimmy Steele* (henceforth referred to as *The Steele Review*) (181). However, PCOs were abolished in 2012. In 2013, the primary dental care budget was stated as 2.8 billion pounds, including patient charge revenue (111).

In 2006, emergency out-of-hours service provision became the responsibility of PCOs (182). The Steele Review (2009) (181), emphasized the importance of accessible urgent care. It was reported that hospital admissions for drainage of dental abscess had approximately doubled from 1998 to 2006 (183).

The concept of World Class Commissioning was intended to “...*drive up the commissioning capability...* (124).” This was supported by the further concept of “*commissioning assurance*” (102) and initiatives from the NHS Institute for Innovation and Improvement (184).

CHAPTER 3: PRIMARY CARE DENTAL SERVICES

3.1 Purpose

Primary care has been defined by the WHO (1978) as being:

“...essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work (44).”

In 1988, The Liverpool Declaration of the WHO Healthy Cities Project stated: *“Primary care is the promotion of health and the provision of health care within communities (185).”*

The 1986 green paper *Primary Health Care: an Agenda for Discussion* (84) defined primary care as “front line” services, including all those services provided outside of hospital. The 1987 white paper *Promoting Better Health* (85) refined the definition of primary care to that which is the “first point of contact” and is “locally based and available to everyone.”

“*Primary*” therefore relates not only to sequence but also to the central role in healthcare (186) and to the fact that it is “...*closest to people’s everyday lives and experiences* (186).” Morris *et al.* (2000) indicated, for dental services, a tension between defining primary care by location, by sequence of contact, by treatment modality, or by practitioner status, and suggested that “...*single definitions are likely to be inadequate...* (187).” They concluded by suggesting a definition based on sequence (187). However, confusion is possible with developments to provide specialist services in primary care settings (188).

3.2 Development

3.2.1 From 1988

A new dental contract in 1990 introduced capitation payments for children but retained fee-per-item payments for adults, though with an additional monthly continuing care payment (189). After a year the earnings of contractor dentists were greater than forecast, through unexpectedly high patient registration, and the government cut dental fees in 1992 (189). Subsequently, many dentists reduced their NHS commitment, cutting the availability of NHS dentistry (190). The government commissioned a *Fundamental Review of Dental Remuneration* (191), published in 1992, which was followed in 1994 by the publication of the Department of Health document *An Oral Health Strategy for England* (89). From 1998 locally negotiated Personal Dental Service (PDS) contracts were established as part of a national evaluation programme (192). PDS pilots showed local commissioning was possible, with dentists maintaining or increasing their NHS commitment, with access improving in PDS areas (192). PDS arrangements were seen as a potential enabler of access in deprived

areas where GDS might not be considered viable (192). However, their full development may have been restricted by uncertainties about their future and the climate of NHS restructuring at the time (192).

Following the Prime-Minister's 1999 promise of access for all by September 2001(193), the Department of Health published *Modernising Dentistry – Implementing the NHS Plan* (2000), a key element of which was improving access to NHS dentistry (90). This was followed in 2002 by the publication *NHS Dentistry: Options for Change* (91), which included local commissioning and testing of new remuneration methods as priorities.

3.2.2 From 2006

Despite some success (192) with PDS pilots, a dental contract was introduced in April 2006 based on three treatment bands (189). Previously, GDS dentists worked mainly on a fee-for-service basis (194) and could vary their location and volume of delivery (194). There had been concern that the new arrangements would be introduced too quickly (176), and there was subsequent criticism of the failure to pilot the new arrangements (100). It was suggested (2012) that trust needed to be re-built between dentists and the NHS (195).

Post-April 2006 some GPs provide services under PDS arrangements as opposed to GDS arrangements (196). PDS agreements are fixed term (although they can be rolled on) and can be limited to a range of services (196).

3.2.3 Workforce

Between December 2008 and September 2014 registered dentists increased from 36,281 to 40,811, and registered Dental Care Professionals (DCPs) increased from 55,926 to 63,083 (197,198).

General Dental Practitioners (GDPs) may provide services through the NHS, privately, or a combination of both. At 2007, approximately 10% of primary care dentists were salaried, employed mainly by PCOs in Dental Access Centres, as community dentists, or in other arrangements, providing a service which complemented that of GDPs by, for example, meeting the needs of vulnerable groups (199).

The 2004 Primary Care Dental Workforce Review (200) suggested, for 2003, a shortage of 1,850 dentists, translating into 9% of demand being unsupplied, and likely to worsen until 2021. However, the number of hygienists and therapists was set to increase (200). Nonetheless, the effect of increased workforce on improving access may be militated against by increased visits by the same individuals (201). It has also been suggested that increasing numbers of NHS dentists might induce over-treatment (101).

The 2006 NHS Dental Activity and Workforce Report (202) showed that in March 2006 there were 21,111 dentists providing NHS treatment in England, 28% higher than in 1997. In 2013/14, 23,723 dentists performed NHS activity in England (203). Following career breaks, particularly for females, dental professionals were more likely to work part-time (204).

Training capacity was reduced when some dental schools closed in the 1980s, subsequently recognized as a misjudgment (205), with training capacity later expanded in order to improve access (206). Dental school applicants (207) and dental students (208) have shown a low desire to work solely in the NHS, with possible perceptions that this may limit opportunities for long-term professional development (101). Some argue that since the state provides training, graduates should initially be tied to the NHS (209). In 2010 there was evidence of a shortage of CsDPH and Dental Practice Advisers (210).

Workforce requirements may be based either on normative need or demand (201). Using normative need could result in oversupply because of normative need exceeding perceived need expressed as demand. Desired dentist- population ratios have been more of an indicator of what is required to address demand rather than normative need (201). However, such ratios may not reflect changes in demand caused by, for example, changes in fees or disease prevalence (201). Therefore, demand-weighting, which attempts to estimate demand from normative need, has been attempted in workforce forecasting (211).

A suggested solution to inadequate clinical capacity has been to expand the role of DCPs (previously termed PCDs) (212-216). DCPs may have been under-utilised (217) and at 2003 the use of hygienists showed significant geographic variation in England (218). Using DCPs to perform treatments otherwise performed by dentists could assist in reducing oral health inequalities (219). Robinson *et al.* (2012) argued for greater use of dental therapists, to improve access (220). However, the 2006 GDS contract may inhibit workforce mix (221), and public acceptance of treatment by therapists may be limited (222). In 2012 The Office of Fair Trading called for the lifting of practicing restrictions in order to expand the roles of

DCPs (223,224). Hygienists, therapists and clinical dental technicians were able to provide services directly to patients from September 2013 (225).

A trend has been shown between increasing years since qualification and an increased proportion of private patients (221,226), although those close to retirement may be more likely to stay in the NHS (221). Schemes were established (227) to encourage dentists who had left the profession to return. In 2007 a BDA survey found that 95% of dentists felt less confident in the future of NHS dental services than they did two years previously (99). Scheffler *et al.* (1996) suggested that improved access would depend on either increased dentists' pay or improved dentists' satisfaction with state dentistry, and that it could be more cost effective to address satisfaction rather than pay (228). Retention in the NHS of participating dentists was considered a benefit of salaried PDS pilots (192).

Private dentistry has an influence on NHS availability (223). New dentists could enter the NHS and then transfer to private practice (101,176). Perri 6 (1996), working with Demos, suggested that NHS access could be militated against by an over-supply of workforce causing dentists to defend their income through specialization or by addressing an increased demand for private cosmetic dentistry (229). Private dentistry has been increasing (223,230) with dentists also having been advised to diversify their income sources (230). NHS working terms and conditions might need to match those in private dentistry to maintain access (231). Perri 6 (1996) stated that the shift of dentists towards private treatment “...*probably now cannot be reversed... and therefore, politicians will try to find some way to legitimate with public opinion a re-drawing of the division of labour between the state and the private sector that might be stable* (229).”

3.2.4 Provision of services

Access is difficult to define (232). One concept of equal access is when the amount of goods that people have to forego to consume a unit of health care is the same across a population (232). Penchansky and Thomas (1981) suggested access was composed of the dimensions of availability, accessibility, accommodation, acceptability and affordability (233). Rosen *et al.* (2001) divided access into “*absolute access*” and “*relative access*”, the latter relating to difficulties experienced by certain population groups (234).

Indices developed for access to medical care include a weighted sum of waiting, travel, waiting room and processing times (235), with another based on the difference between ideal and actual number of services, workforce and equipment in a community (235). The proportion of the population seeing an NHS dentist over a twenty-four month period was used as an official access indicator (236). In the second quarter of 2009, this figure was 54.7% (236). A subsequent indicator, introduced in 2010, assesses the proportion of people who have been successful when trying to get a dental appointment (237). For January to March 2012, in England, 93% of those trying to get an NHS dental appointment in the preceding three months were successful (238), remaining unchanged for the same period in 2014 (487). The 2009 Adult Dental Health survey found that 93% of adults trying to make an appointment over a three-year period (not restricted to NHS) were successful, but also found that 19% had delayed treatment because of cost (239).

An “*inverse care law*” (15), where availability is inversely related to socio-economic status, appears to have applied to dentistry (151,483,488). The National Audit Office reported in 2004 that there was a mismatch between demand and the number and location of dentists (177). However, there are patient flows between areas (57,240) and therefore patients may not reflect local demographics (240). Tickle *et al.* (150) found that children from deprived backgrounds were more likely to use a service close to their homes and they therefore argued that dental services for deprived areas should be provided locally. The NHS had aimed to ensure that there will be access for everyone who seeks it by March 2011 (136). Donabedian noted that improved access offers opportunity for more bad care as well as good, with quality assurance therefore becoming more important (241).

Charities and Non-Governmental Organisations had conducted dental surveys. In 2007 the Commission for Patient and Public Involvement in Health (242), found that almost one fifth of patients reported foregoing treatment because of cost, and with 78% of patients using private dental services reporting they did so because their dentist had stopped treating NHS patients, or because they could not find an NHS dentist. Thirty-five per-cent of those not using dental services reported that it was because they had no local NHS dentist. They also found that most dentists felt the 2006 contract had not improved access, consistent with a BDA survey (2007) (99), and were aware of patients declining NHS treatment owing to cost. The Citizens Advice Bureaux (2007) drew attention to access difficulties, including for rural communities, alleging a “*postcode lottery*” for dental services (243). Access to healthcare generally in rural areas has been criticized (244,245,246).

Sheiham and Tsakos (2007) drew attention to various definitions of need and the shortcomings of relying on normative (expert-defined) need, including a failure to relate to quality of life and to take into account the attitudes and behaviour of individuals, and also possible over-estimation of its objectivity and reliability (247). Sheiham and Tsakos (2007) stated that OHNAs should incorporate oral health-related quality of life indicators and perceived treatment needs in order to counter shortfalls of relying on normative need (247). Differences between normative need and perceived need relating to oral health have been demonstrated (248). Culyer (1976) pointed out that normative need implies a “*shadow in the wings*” applying value judgments about what a person ought to receive; the criteria and qualifications of these third parties can be questioned (249). Sheaff (1996) suggested that a theory of health care needs could be impossible to develop (250), and Bradshaw (2005) questioned the usefulness of the concept of need in policy-making owing to its imprecise, complex and contentious definitions (251). Bradshaw (2005) advocated greater attention to inequality as a guide to policy (251). It has been argued that a focus on needs is a “*red herring*” and the focus should be on outcomes, costs, and benefits (252). Klein (1989) pointed out that “...*the languages of need and demand are incompatible: they reflect different values and point to different policy solutions* (253).” Klein continues: “...*the history of the NHS shows a continuing attempt to blend them into a neutral policy Esperanto. In a sense the NHS consensus has been based on the assumption that the paternalism and consumerism can be combined: that there is no need to choose* (253).”

Demand may be substituted for need as a basis for policy-making. Culyer emphasized the importance for policy-making of distinguishing between demand for health and demand for health care (254). Regarding demand analysis for health care, Sheaff (1996) states that this

“...presupposes that the current discipline of economics constitutes a scientific account of how market economies work; an extremely dubious assumption (255).” The NHS has used the concept of *“capacity to benefit”* to define need (251). However, this would exclude preventive treatment as capacity to benefit is meaningless in this context (251). According to Culyer (1995) need for health care can also be defined as *“...the minimum amount of resources required to exhaust a person’s capacity to benefit (256).”* If *“capacity to benefit”* was the basis for policy-making then an individual predicted to show a below-target improvement might be excluded from treatment, particularly in a system with limited resources (256). Using *“capacity to benefit”*, rather than *“exhausting capacity to benefit”* can, therefore, lead to increased inequalities (256). Health equity audit, comparing need to service provision, has been suggested as a tool for PCOs to use in addressing inequalities (257).

NHS Choices (258) has been seen as a way of improving access by displaying whether practices are taking on new patients. However, this information was known to be sometimes wrong (224), and NHS Choices was suffering from low usage and low awareness (224). In 2012, SPA Future Thinking found that there was a higher than average number of dental practices in affluent urban geographies (259). In 2012, a report by TNS-BMRB (260) stated that there was strong public belief that it would be difficult to find an available NHS dentist. Marshman *et al.* (2012) showed that perceived difficulties in accessing dental services was a predictor of dental outcomes in adults (79)

3.2.5 Uptake of services

Dickson (1968) found that attitudes to, and uptake of, dentistry were associated with social class (261). Further associations between social class, or aspects of disadvantage, and dental attendance have been demonstrated (55,68,221,262-264). The effect of employment status on ability to take time off work to visit a dentist also appears to influence uptake (221).

The NHS Dental Statistics for England (2nd quarter, 2009) (236) showed that in the two years up to 30 September 2009, 54.7% of the population of England (50.6% of adults and 69.8% of children) visited a NHS dentist. For the two years leading up to March 2006, when the previous NHS arrangements terminated, the population figure was 55.8% (51.6% of adults and 70.7% of children). In both data-sets there were significant differences between SHAs and between PCOs. In the period between these data-sets the proportion of the population attending over a 24 month period had dropped to 52.7% and recovered (236). In the two years up to 30 September 2014, the corresponding population figure was 56% (265). The 2009 Adult Dental Health Survey showed that 77% of dentate adults visited a dentist at least every two years and for 71% their last course of treatment had been with the NHS (266).

Uptake can also be recorded by the number of courses of treatment carried out. The NHS Dental Statistics for England (2nd Quarter, 2009) (236) showed that in the second quarter of 2009/2010, 9.7 million courses of treatment were carried out, 4.1% higher than in 2008/2009. Changes in methodology do not allow volumes of courses of treatment to be compared with those from before the year-end 2006/07 (267). In the first quarter of 2014/15

there were an estimated 9.8 million courses of treatment (265). There are significant differences between SHAs and between PCOs.

3.3 Developments from the Steele Review onwards

The Steele Review (2009) (181) called for changes in delivering primary dental care. In 2010 the Government subsequently published proposals for piloting a reformed dental contract (268).

The successful passing of the *Health and Social Care Bill* (2011) (269) signalled radical reorganization of the NHS structure supporting primary care, including dental services.

In April 2011 the government announced that it would use a break in the legislative timetable to consider issues raised by the Bill (270). The NHS Future Forum was established as an independent advisory panel and reported back to government (270) that the 2011 Bill (269) had caused amongst patients and staff “...*fear and anxiety that the reforms would not deliver what we want.*” In addition, some “...*feared for their own job prospects, others because they feared that their NHS was about to be broken up...* (270).”

An NHS Commissioning Board (later re-named NHS England) was established, which was to have: “*An objective culture, using evidence to inform the full range of its activities* (110).” The NHS Commissioning Board (2012) decided upon geographies for twenty-seven Local Area Teams (LATs) (271), the boundaries of which sometimes encompassed PCO areas that fell under different SHA areas. LATs were to undertake commissioning for dental services (271), thus replacing PCOs in this function. The model for commissioning public

health services was not finalized at that (June 2012) stage (271). Local professional networks (LPNs), supporting the LAT, would, with wide engagement, provide local support for national strategy and policy and help develop and deliver on local priorities and secure dental services (111). In 2014, Area Teams (the term Local Area Team had been dropped) were subject to an additional re-structuring (272). The NHS *Five Year Forward View* (2014) (273) included a focus on efficiencies and innovation in the NHS. *Next steps towards primary care co-commissioning* (2014) (274) raised the possibility that Clinical Commissioning Groups might have a future role in commissioning dental services. At 2015, piloting for a reformed dental contract was moving on to a prototyping stage (275).

Up to April 2013 CsDPH were largely employed within the NHS by PCOs or SHAs. Subsequently, their employment was transferred to Public Health England (PHE), a civil service body (276), meaning that they were then based outside of the NHS structure (276).

CHAPTER 4: STRATEGY AND INNOVATION

4.1 A note on semantics

Semantic difficulties present themselves at various stages in this research and the author prefers to address the issues collectively rather than to repeat similar points at different locations. The words “*innovation*” and “*strategy*” are both subject to polysemy (277), in that they can have different but related meanings. Meanings of “*innovation*” are all related to novelty. Meanings of “*strategy*” are related to planning and intentions. The literature review and the empirical findings of this thesis confirm such variable meanings.

Blurred boundaries around related concepts, such as strategy and policy, also present difficulties. Wittgenstein’s (1953) contribution is relevant: “*But if the colours in the original shade into one another without a hint of any boundary, won’t it become a hopeless task to draw a sharp picture corresponding to the blurred one (278)?*” This insight suggests it might be futile to try to define some words precisely. Defining terms for *residua* excluded by a definition could also be problematic. What would “*strategies*” no longer defined as such become?

4.2 Strategy

Cummings and Wilson explained that strategy could be an organisation's "...onward movement in space and time, where it goes and where it does not go (279)." Mintzberg (1978) found varying definitions of strategy to generally have a common theme of "...a deliberate conscious set of guidelines that determines decisions into the future (280)."

Mintzberg (1978) distinguishes between intended strategy and realized strategy, which he defines as "...a pattern in a stream of decisions (280)." Using this interpretation, strategy can be *a priori* or emergent (280), consistent with a classification of strategies developed by Whittington (2000) (281). Mintzberg's (1978) diagrammatic representation of strategy formation is displayed at figure 1.

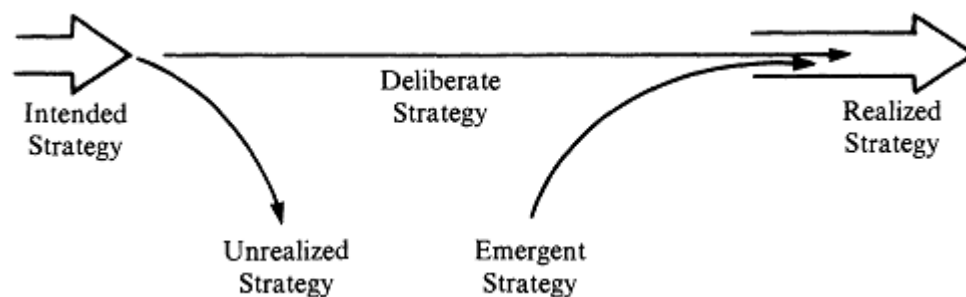


Figure 1. Types of strategies. From Mintzberg (1978) (280)

Mintzberg (1978) found that strategy could be highly ordered and integrated, or it could be the result of an adaptive process among different decision-makers with conflicting goals resulting in a stream of incremental and disjointed decisions (280). The idea that strategy is formulated on high and implemented lower down assumes that the formulator can be fully informed and that the environment is sufficiently stable or predictable such that

reformulation will not be required during implementation (280,282). Otherwise, an adaptive, emergent strategy, mode may be preferable, with implementation feeding back into strategy formulation (280,282).

Child (1972) emphasized the ability of dominant members in an organization to exercise strategic choice (283). Strategic choice presumes decisions. However, Cohen *et al.* (1972) suggested that changes occur (rather than decisions taken) when serendipity allows problems, solutions, participants and “*choice opportunities*” to come together in what may otherwise be “*organized anarchy*” (284). It has been argued that this may explain limited searches for alternative solutions (281). Such challenges against choice led Pettigrew (1990) (285) to think in terms of strategic change instead of strategic choice, because in some instances organizations did not appear to develop alternatives on which to base a choice. Regardless of strategy success or failure, the planning process may still fulfil social and symbolic functions for an organization (281). Watt and Sheiham (2012) (114) reported that a common risk factor approach had been “... *highly influential in integrating oral health into general health improvement.*” Lewis (2012), referring to Australia, stated “...*oral health will not progress as an agenda item if it remains separate from the rest of health* (286).” However, the extent to which the contributions from Watt and Sheiham (2012) and Lewis (2012) relate to overcoming power is unclear.

Power may be relevant to the development of strategy through decision-making. Lukes (2005) described second and third dimensions of power (287). The second dimension refers to the power to not make decisions, and the third relates to power over agenda-setting. Expressions of power may keep certain issues off agendas. Similarly, Bachrach and Baratz

(1962) suggested that power can be used to confine the scope of decision-making to particular issues (288). Anderson (1975), Hogwood *et al.* (1984) and Walt (1994) also drew attention to the importance of non-policy making or non-decision making (289,290)(291 p. 21).

There may be disparity between rational decisions for the organisation and rational decisions for individual decision-makers, compounded by the difficulty of decision-makers to objectively consider all options and all possible consequences (292). This could lead to decision-making within a “*bounded rationality*”, where not all alternatives are examined, with resultant “*satisficing*”, where decisions need only be satisfactory (293). Lindblom (1959) argued that organisations may make incremental decisions and “*muddle through*” (294).”

Group decision-making, with the advantages of varied inputs, encouraging creativity and helping spread responsibility may result in unrealistic over-confidence and illusion of control (295 p. 104-107). Hierarchy might allow outcomes to be over-influenced by senior persons, owing to deference, perceived duty, or an instinct for self-preservation (295 p. 104-107). Other factors negatively affecting group outputs include lack of impartial leadership, lack of methodical procedures, a recent failure, group isolation and group homogeneity (296,297). Barriers to strategic thinking may be more attributable to organizational than individual factors, with potential problems including groupthink, internal politics, the role of group norms, and cognitive routine having been described (295 pp. 104-107). Being modern is associated with improvement (298), and consistency with societal norms can help legitimate strategic decisions (295, p. 119).

4.3 Innovation

Some aspects of innovation differ between the public and private sectors (299). Public sector innovations are generally government property, with no venture capital funding, and with financing often derived from potentially unstable spare resources (299). Individual reward may be more in the form of recognition than financial (299). Public sector innovation is seen as a means to improve efficiency and may help in keeping up with societal change, including raised public expectation driven by the private sector (300). Adverse selection could lead innovative individuals away from a career in the public sector (299) and risk aversion may derive from the media and political opposition being ready to criticise public sector failure (299). Conroy (2009), researching mental health services, emphasised: “*How little we in the public sector are exposed to and apply innovation and contemporary thinking* (301).”

Innovation can be something derived from elsewhere as well as something invented (7,8), although some academics exclude invention from the concept of innovation (8). Rogers (1995) suggested that a perception of something being new was adequate to classify it as an innovation, whether it was actually new or not (302, p.11). Closely related innovations may be clustered, with one innovation dependent on others, and with the boundaries between innovations sometimes being imprecise (302 pp. 14-15).

The following sub-sections focus on stages of innovation that the researcher observes from the literature are commonly indicated to occur, allowing for differing terminologies and frameworks (12)(14 pp. 23-25)(302 pp. 403-404)(303). However, in reality progress may be

non-linear (14 p. 23). Diffusion and dissemination could have been placed at the end and the beginning because, except in the case of invention, an adopting organisation would have learnt about their innovation by diffusion or dissemination. For invention, there could be no diffusion or dissemination as a first stage. Greenhalgh's (303) conception of health service innovation diffusion, dissemination and implementation is illustrated at figure 2.

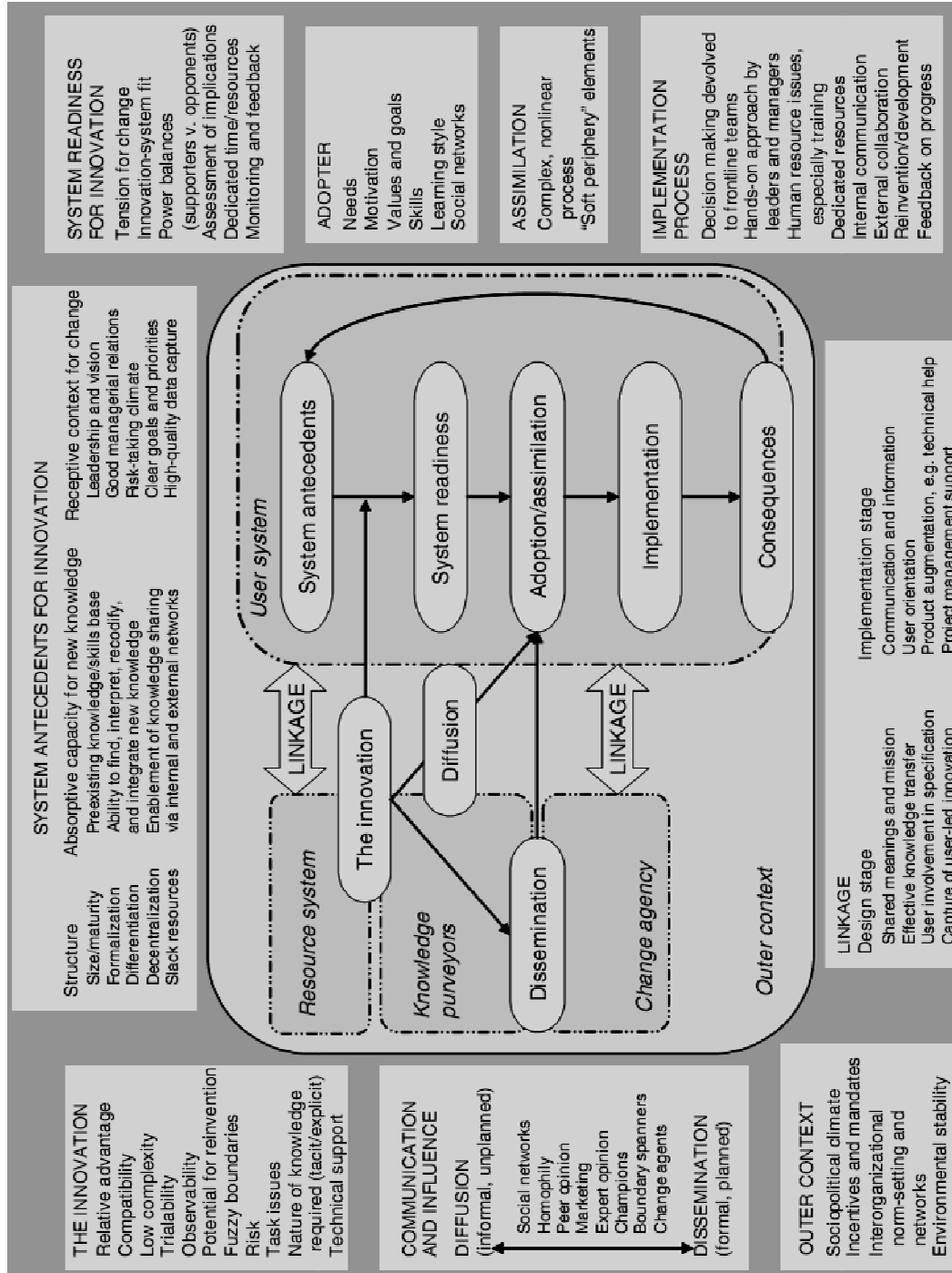


Figure 1. Conceptual Model for Considering the Determinants of Diffusion, Dissemination, and Implementation of Innovations in Health Service Delivery and Organization. From Greenhalgh *et al.* (2004)

4.3.1 Innovation pathway: Adoption

Hoagwood *et al.* defined adoption as “...*the decision to engage with the new interventions* (304).” This is the approach taken in this thesis. Damanpour (1987) considered that because adoption incorporated implementation, innovation commenced at implementation (7,305).

A limited generalisability of empirical findings from an adoption in one location was suggested by Downs and Mohr (1976) (306) and challenged by Damanpour (1991) (7). Downs and Mohr argued that certain attributes of innovations could be perceived differently by organisations that varied in their own attributes (306). Damanpour contended that closer attention to different types of organisations and innovations could provide generalisable conclusions (7), consistent with Daft (1978) who, in his “*dual-core model*”, indicated that bureaucracy may facilitate administrative innovations whereas a decentralised and less formalised organisation may facilitate technical innovation (307). Kimberly and Evanisko (1981) found that adoption of technological innovations was differently influenced by organisational variables than the adoption of administrative innovations (308). In addition, Downs and Mohr (1976) indicated that determinants of adoption might differ from the determinants of depth of adoption (306). Rogers (1995) suggested that adoption may require the prior adoption of a new value system by the organisation (302, p.16).

Adopters have been classified sequentially into early adopters, early majority, late majority and laggards (302 p. 22). The late majority and laggards may not be irrational or resistant to change because the innovation might not have been appropriate for these groups and they

may have been behaving rationally (302 pp. 265-266). Dearing and Meyer (1994) developed a tool for predicting adoption decisions (309) and drew attention to the potential role of differing perceptions of the attributes of an innovation between the innovation source and the potential adopter. Berwick (2003) suggested that how an organisation dealt with early adopters was important, particularly with regard to the interface between the early adopters and the early majority (310). Non-adoption may, however, develop to be seen as innovation; failure to adopt certain agricultural innovations can be portrayed as organic farming, which can be portrayed as an innovation (302 p. 186).

Organisations or individuals of similar innovativeness may have unequal opportunities to adopt innovations, and variable organisational learning capacity may also impact on innovation adoptions (311).

4.3.2 Innovation pathway: Implementation and post-implementation

Hoagwood *et al.* defined implementation as “...*the extent to which the proposed interventions were feasibly carried out and instituted...* (304).” This is consistent with the approach taken in this thesis.

Durlak and DuPre (2008) described eight aspects of implementation (12). These were fidelity to the intended innovation, the extent of implementation, the quality of the process, the response of participants, the extent to which the innovation differed from other programmes, the monitoring of control or comparison conditions, programme reach, and changes made during implementation. The authors pointed out that flexibility might be

required for local adaptation (12). Durlak and DuPre (2008) found that effective implementation was associated with better outcomes and that collaborative decision-making facilitated effective implementation (12). Durlak and DuPre (2008) maintained that there is a post-implementation stage relating to innovation sustainability (12). Ricketts *et al.* (2003), researching mental health services, found that implementation by general medical practitioners was aided by face-to-face contacts, training and ability to provide feedback (312). Individuals' perceptions that funding may not be ongoing may hinder implementation (313).

Harrison and March (1984) suggested a bias towards post-decision disappointment because of over-optimistic decisions (314). Positive outcomes may be assisted by having multiple sub-goals that add up to the overall goal, although more opportunities to fail may reduce the odds of overall success (14 p. 71). Fennell (1984) drew attention to the possible importance of the sequence of organisational implementation of innovations along with appropriate intervening time periods (315). Van de Ven *et al.* (1999) stated: "*Entrepreneurs and managers cannot control innovation success, only its odds* (14 p. 65)."

4.3.3 Innovation pathway: Diffusion and dissemination

Greenhalgh *et al.* (2004) (303) distinguished between dissemination, involving effort to spread an innovation, and passive diffusion. As innovation sources may not be homophilous with potential adopters their role in dissemination may be limited (302 p. 26). However, respected opinion leaders located centrally in communication networks in an organisation can facilitate dissemination desired by an external change agent (302 pp. 27-28). Berwick

(2003) suggested that dissemination may be facilitated by recognising potential early adopters and also recognising their need for resources (310). Similarly, Gollop *et al.* (2004) drew attention to the importance of a change facilitator's abilities to recognize the extrinsic and intrinsic incentives that would be effective in particular instances with particular sets of individuals (316).

Effectiveness of knowledge transfer may depend on an organisation's absorptive capacity, the closeness of social ties, and the disposition, motivation and abilities of the source and recipient (317). Effective knowledge transfer may also depend on perceived source reliability (317), on whether an organisation's culture is competitive or collaborative, and the ability of the source to explain new practice (318).

Szulanski (2000) described "*initiation stickiness*" as a difficulty in recognising opportunities to both disseminate and to act on opportunities to disseminate (318). Knowledge diffusion within and across organisations may be limited owing to complex interdependencies and balances of power (319). Where holding knowledge is a feature of holding power within an organization, it is possible that individuals may not want to unconditionally release information (320). In addition, individuals may be unwilling to share knowledge for the organisation's benefit (320). Pate *et al.* (2010) drew attention to the difficulties for management engendered by the stronger identification of health care individuals with their profession than with organizations (321).

4.3.4 Variables for adoption or implementation: Innovation attributes

Greenhalgh *et al.* (2004), researching health service innovations, stated: “*Further research into the attributes of innovations that promote their adoption is probably not needed* (303).” Therefore this was not a research priority in this thesis. Such attributes include cost, perceived benefits to the organisation and degree of complexity (302,322,323).

Fitzgerald *et al.* (2002), consistent with Ferlie *et al.* (1995) (324), found that for health care there was “*...no direct association between the robustness of the scientific evidence and the speed of diffusion* (325).” Sheaff *et al.* (2009) found that PCT policy innovations sometimes had an absent or limited evidence-base (326). Denis *et al.* (2002) found that relative advantage to an organisation did not always predict adoption, with aspects of a health care organisation’s culture being moderating factors (322).

4.3.5 Variables for adoption or implementation: Individuals

High socio-economic background, being an opinion leader, and greater social inter-connectedness have been associated with being an early adopter (302 pp. 269-274)(327). Early adopters may become aware of an innovation before their peers as well as being quicker to adopt (302 p. 199).

Individuals may vary in their knowledge as to where to go beyond an organisation to find potentially useful information (317). Burt (2004) analysed “*structural holes*” in inter-group information flows and argued that “*...people who stand near the holes in a social structure*

are at higher risk of having good ideas (328).” He suggested that individuals near these “holes” could broker knowledge, thus conferring organisational advantage (328). Burt (2004) also stated: “*People connected to groups beyond their own can expect to find themselves delivering valuable ideas, seeming to be gifted with creativity* (328).”

Granovetter (1973) suggested weak social ties were important as these were more likely to connect to a wider network, whereas strong ties often fed back more proximally to the individual in a network (329,330). Borins (2001) suggested that younger people in organisations may be closer to university-derived “*cutting-edge thinking*” (299). However, Van de Ven *et al.* (1999) suggested that innovation could be restricted by “*...the limited capacity of human beings to handle complexity and maintain attention* (14 p. 13).”

March (1991) (331) used the term “*exploration*” for processes related to innovation and invention and used the term “*exploitation*” for getting more benefits out of what the organisation already had. Rosing *et al.* (2011) recognised that “*exploitation*” could also involve innovation and stated: “*The main requirements of innovation are exploration and exploitation as well as a flexibility to switch between those two activities* (332).” Rosing *et al.* saw this switching ability as a leadership function, but also considered that different leadership approaches were applicable to “*exploration*” and “*exploitation*”, necessitating “*ambidextrous leadership*” (332). Similarly, Van de Ven *et al.* (1999) emphasised the benefits of pluralistic leadership, where leadership is provided by different individuals, as required by different stages of the innovation process (14 pp. 111-120). Leaders have a role in encouraging innovation (333), but top-down rather than collaborative leadership may result in a non-receptive culture for innovation (333), with top management also possibly too distant or isolated (333). Transformational leadership has been associated with innovation,

but inconsistently, because a culture of innovation in an organisation may be a prerequisite (332).

Meyer *et al.* recognised that individuals, or groups, within organisations had differing perceptions about particular innovations, suggesting the possibility of tailoring innovations to particular groups (323). Adoption may be influenced by the means of communication used, and how this is tailored to the knowledge and readiness of groups or individuals.

Where innovation is complex or risky, direct interpersonal communication may be required (323,334). Scheirer (1990), researching mouth rinse programmes, emphasised the importance of informal inter-personal communication, adding that “...*the key process seems to be the presence of strong personal influences to bring the programme into formal decision channels* (335).”

4.3.6 Variables for adoption or implementation: Local organisational factors

Mintzberg (1983) suggested that bureaucratic organisations were ill-suited to innovation, largely because they were set up to interact with a stable environment (282). The disadvantages of Mintzberg’s (1983) “*machine bureaucracy*” (282), including rigidity, lack of responsiveness and discouragement of innovation, may have contributed to organizations, particularly in the private sector, moving away from this type of structure (295 p. 3).

However, bureaucracy has some advantages, including efficiency in large scale routine tasks, and the discouragement of arbitrary decision-making (295 p. 4). Nonetheless, the effect of bureaucratic hierarchy could conflict with the benefits of maximizing use of expertise (292).

Borins (2001), in American research into public sector organisations, found that innovation arose from all levels of the organisational hierarchy, with the middle being most fruitful (299).

In the public sector, restructuring in terms of markets and consumers may have helped overcome some dysfunctions of bureaucratic organizations (295 p. 5) However, moving from a bureaucratic to a market-based model may impact negatively on employees' "*psychological contracts*", which in turn may impact negatively on commitment and knowledge development or transfer (295 p. 8). Rational choice theory has been used to analyse bureaucracy, with Niskanen (2007) expounding on the behaviour of individuals to fulfill their own interests (336). However, "*new institutionalists*" recognized that bureaucratic behavior sometimes went beyond individuals maximizing their own utilities, with behaviours such as compliance with organizational norms and attempts at legitimation occurring (337 pp. 26-29). Dunleavy (1991) also assumed bureaucrats would maximize their own utilities, but in doing so some benefits may also accrue to the organization, such as the development of a valuing of innovation (338). Lipsky argued that there were "*street-level bureaucrats*" interfacing with the general public and that such individuals would sometimes act contrary to the rules of their bureaucratic organization (339).

Burt (2004) associated "*high network constraint*" in an organisation with reduced acceptance by senior management of new ideas from subordinate managers, and associated "*low network constraint*" with greater such acceptance (328). Burt (2004) used the term "*social convenience*" to explain management inertia in getting beyond their closer network ties, where "*...ideas were not discussed to change business practice as much as they were*

discussed to display competence and to entertain familiar colleagues (328).” Burt found that “...managers who acted on their ideas rose above social convenience to discuss their ideas with contacts beyond their closest colleagues (328).”

It can be difficult to tell whether awareness of a need or awareness of an innovation come first (302 p. 165). Van de Ven *et al.* (1999) suggested that a “*shock*” may be required for an organisation to turn to innovation (14 pp. 28-30), and also found implementations to be punctuated by setbacks (14 p. 13), consistent with NHS innovation research by Ferlie *et al.* (2005) (324). Such setbacks can cause the resource and development time-lines to diverge (14 p. 24). Van de Ven *et al.* found networks of stakeholders were constantly revised “*fuzzy sets*” and that innovations tended to proceed down multiple, sometimes uncoordinated tracks (14 p. 9).

Scheirer, researching fluoride mouth rinse programmes, emphasised the importance of “*champions*” (335). Organisational recognition of opinion leaders, innovation champions and individuals who can communicate across domains (“*boundary spanners*”) has been seen as important for innovation (302 pp. 308-311)(325,340,341). Ferlie *et al.* (2005) found that boundaries within and between professions could retard dissemination (324).

Opinion leaders are not necessarily those with the highest formal position or status in the group (302 p. 27). A lack of a profit motive in the public sector may require that organisations incentivise individuals to be more innovative through other means such as recognition (300). Prestige, organisational or individual, may be a factor in early adoption (302). A “*change agent*” (302 p.335) may facilitate adoption and has been described as

“...an individual who influences clients’ innovation-decisions in a direction deemed desirable by a change agency (302 p. 335).”

An organisation’s absorptive capacity for new knowledge, including an ability to recognise its value and make use of it, has been considered important for innovation (303,317,325). This relates to various organisational variables including the existing knowledge base, values and goals around learning, leadership, and boundary-spanning roles (342). Cohen *et al.* (1990) stressed the importance of “*prior related knowledge*” to organisational absorptive capacity, and felt that this capacity depended on individuals’ absorptive capacity within the organisation, particularly for those interfacing with the external environment or different sections of the organisation (317). Language facilitating intra-organisation communication may impact negatively on an ability to recognise useful external information presented in a less familiar way (317). As absorptive capacity is intangible and has delayed benefits, it is difficult to determine how much of this an organisation has (317), which may result in absorptive capacity being overlooked, including for investment (317). However, for innovation, O’Connor *et al.* (2007) suggested that “*innovative capability*” was separate to “*innovation capacity*” because such capacity might not be made use of (343). Ham (2003) emphasised building the capacity for change and innovation in health care organizations and suggested that this “*...is likely to have a bigger effect than further bold policy strokes* (344).”

Organisation size has been positively associated with innovation (8), although this may be a surrogate for other factors positively associated with innovation, such as financial and

human resources (302 p. 379). However, Moch *et al.* (1977) felt that size had direct and indirect effects (345). Mohr (1969) found a strong association between expenditure and innovation (8).

Innovations may be included in strategy, and organisations may pursue more than one strategy, which may clash or fail to integrate (295 p. 54). Further, different strategies can apply to different sections of one organisation, with difficulties occurring when one strategy and its associated section is more powerful (295 p. 54).

Klein and Sorra (1996) suggested that organisational support of employees in using an innovation and the fit of an innovation with the values of individuals in an organisation were important moderators of implementation quality (346). Ricketts *et al.* (2003), researching mental health services, found that good managerial support was an important factor in effective innovation development (312). This study also demonstrated resistance to changes caused by an innovation where there had been a preceding background of change (312).

Acceptance of risk (323) facilitates innovation. West *et al.* suggested that “...*innovative teams tend to legitimate controlled experimentation, be tolerant of a diversity of approaches and support the initiation and development of ideas (climate)* (347).” However, a culture of risk aversion has been a perceived barrier to public sector innovation (300). Fidler and Johnson (1984) concluded that perceived risk and complexity that caused resistance to an innovation might be militated against by attention to power structures and communication attributes of an organisation (334). Inadequate communication within or across organisations

may lead to sub-optimal understanding of an innovation, and confusion could lead to difficulties such as staff resistance or lack of integration (348).

Schein (1985) indicated how, in an organisation's early stages, innovation may be more desired than later, when creativity might cause disruption and anxiety, and described this as a paradox because innovation might be required for survival (349 p. 165). This is consistent with March (1991): “...*since long-run intelligence depends on sustaining a reasonable level of exploration, these tendencies to increase exploitation and reduce exploration make adaptive processes potentially self-destructive* (331).”

Mulgan *et al.* (2003) drew attention to how “*short-termism*” could inhibit innovation by excluding innovations not matching the time-frame (300). Mulgan's conception of barriers to public sector innovation is illustrated at figure 3.

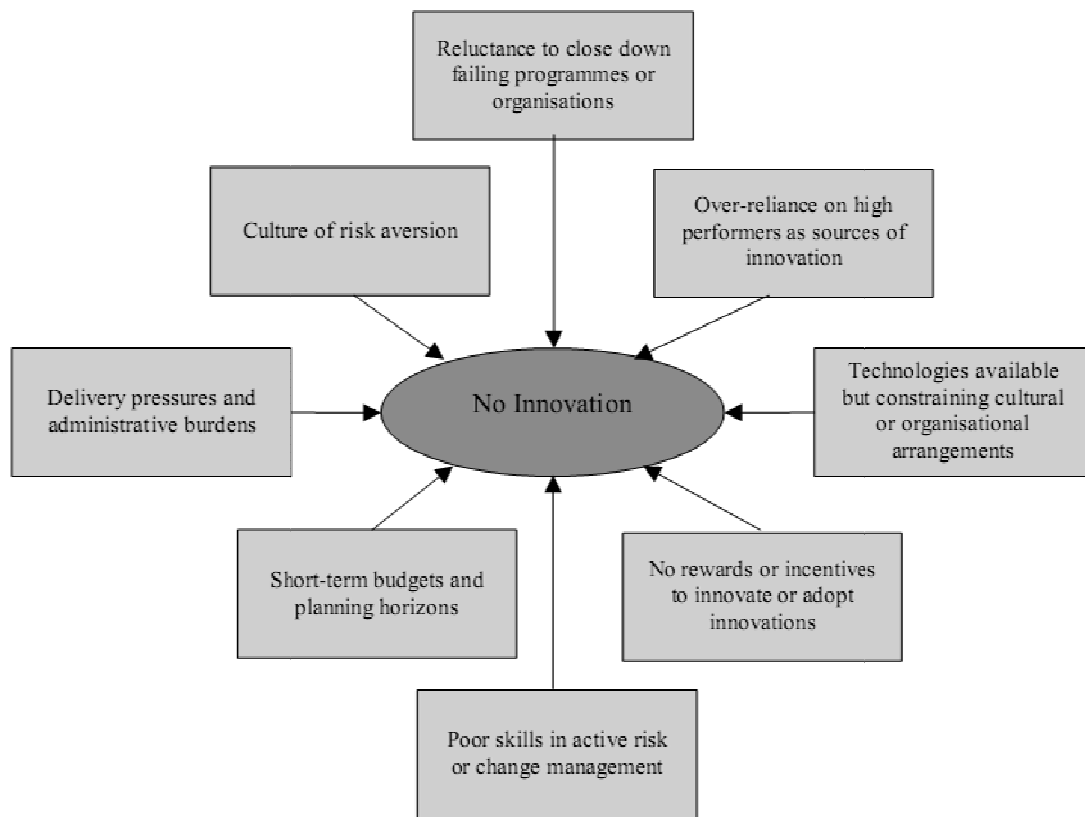


Figure 3. Barriers to public sector innovation. From Mulgan *et al.* (2003) (300)

Rosing *et al.* (2011) stated that innovation was likely to be more successful if the explorative and the exploitative functions were not separated into different teams (332), arguing that this would result in loss of synergy and would not accommodate the recursive nature of innovation progress (332).

The type of organisation required to maximise innovation may conflict with the culture of senior management (295 p. 55). Organizational culture has eluded universal definition. Schein's (1985) opinion that culture is the "...*deeper level of basic assumptions and beliefs that are shared by members of an organization...*" appears useful because, as Schein suggests, higher level phenomena might "*reflect*" culture, but not be part of the essence of it

(349 p. 6). Schein (1985) suggested there may be several cultures within an organization, for example a managerial culture and a worker culture, that co-exist with the over-all culture of the organization (349 p. 7). A dialectic between innovation deriving from organizational rational planning and deriving from a conducive organizational culture has been described (320). An additional dialectic between creativity and control in an organization may exist (320).

Organisations may have to discard previous knowledge and practices, which may present a challenge, in order to sustain implementations (318). If organizational change cannot accommodate the speed of implementation then sub-optimal implementation may result and too slow implementation might allow earlier practices to become institutionalized (318).

Scheirer (1990), studying school fluoride mouth rinse programmes in the USA, found that much non-adoption was not explained “...*from weighing pros and cons, but from the absence of any decision point at all* (335).”

4.3.7 Variables for adoption or implementation: Macro-level and environmental factors

A greater emphasis on decentralization appeared in *The New NHS: modern, dependable* (1997) (350). However, local autonomy has been constrained by central standard-setting, central policy, and the need for the centre to remain accountable (351 pp. 262-263). Ham (2009) stated: “*The past decade has witnessed a sustained attempt by the Blair and Brown governments to exert greater control over the NHS from Westminster and especially*

Whitehall, alongside policies ostensibly designed to shift the balance of power to a local level (352 p. 207)."

Decentralisation, encouraged by New Public Management ideology (353), has been viewed as a promoter of organisational innovativeness (354). Bossert (1998) used a concept of "*decision space*" (355) to describe the degree of autonomy of local actors in a decentralized health system. Even with "*decision space*", innovation may not occur because of lack of incentive, or a lack of capacity or capability to innovate and implement (355). Pollitt *et al.* (1998) distinguished differential decentralisation of power across different public sector domains, and found that freedoms arising from decentralization tended to be used cautiously (337 pp. 162-164, p. 180). Pollitt, in earlier work (1991), described how decentralization could be "*hollow*" if not matched by resources (356). Perrow (1977) suggested that necessity to centralize in order to decentralize was a bureaucratic paradox (357). Greenhalgh maintained that top down approaches could run into problems because they ignore how the NHS works (358,359). The claimed relevance to innovation of a triple helix between University-Industry-Government (360) was adapted in Greenhalgh's work on the NHS to be between social structures, people and technologies (358).

Greener *et al.* (2009) stated: "*The apparent decentralizing of funding to PCTs might be more than counterbalanced by a loss of decision space resulting from other reforms (361)."*

Transferring of budgets to PCOs may not represent decentralization as these funds would have had to be transferred to NHS organizations to pay for care anyway (361).

Decentralization may therefore be better defined in terms of local decision-making ability (361). However, this could be undermined by inadequate links with local communities (351

p. 234) (361). Nonetheless, it can be difficult to determine what the public opinion is, even where this is taken into account (362).

A justification for decentralization is based on the assumption that locally-managed services will be less bureaucratic and more flexible and responsive to need (361). Decentralisation was seen as a benefit in public services from the 1990s (361), with Osborne and Gaebler (1993) (354) emphasising that decentralization could facilitate innovation (354). However, Goodsell (1993), criticizing Osborne and Gaebler's approach, suggested that decentralisation could conflict with public sector norms such as accountability and decision-making by elected representatives (363). Rogers (1995) stated: "*In a centralized organization, top leaders are poorly positioned to identify operational-level problems, or to suggest relevant innovations to meet these needs* (302 p. 380)." However, centralization may encourage implementation, once a decision has been made (302 p. 380).

Gollop *et al.* (2004) drew attention to skepticism by NHS clinicians and staff towards any proposed top-down organizational change, with beliefs that changes were transient and founded on political whims, and with targets being prioritized above service improvement (316). It has been suggested that the number of targets and other formal requirements may need to be radically reduced in the public sector to create space for creative thinking and consideration of alternative solutions (300). Locock (2003) indicated that clinical ownership was important for successful "*healthcare redesign*" and suggested that clinicians might reject approaches that looked like "*management fads*" (364).

Innovation can engender resistance where individuals may gain from an unchanged system. For example, reducing waiting lists might reduce opportunities to provide private care (316,365). Ham *et al.* (2003) drew attention to the potential resistance to innovation caused by the inertia relating to existing work patterns, alongside the power that physicians can exert (365). Elements that confer advantage in a competitive market may facilitate implementation. This, alongside the effect of peer pressure, was observed in developing school healthy eating programmes (313). Scheirer (1990), researching mouth rinse programmes in the USA found that ongoing external support, along with the perception of stable funding, helped prevent discontinuation (335).

There is sometimes an interval between policy and implementation, even when evidence-base informs policy (319). Political short-termism could under-mine longer-term programmes aimed at solving public problems, referred to by Sorell (2003) as the “*two timescales problem*” (366).

4.3.8 Central policy on health care innovation since 2002

Enthoven (2000) suggested that the NHS structure lacked “...*a coherent strategy for motivating innovation and improvement*” (367). Mulgan *et al.* (2003) stated that government departments have a role to “...*foster innovation and its diffusion* (300).” Cooksey (2006), questioning NHS capacity to take up new ideas and technologies (368), stated that NHS dissemination of innovations was variable, and emphasized a need for “...*a more positive culture of innovation to disseminate best practice beyond existing NHS ‘islands of excellence’* (368).”

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The relevance of the document *High Quality Care for All – NHS Next Stage Review Final Report* (2008) (5) is indicated in the introduction. In addition, this document announced the establishment of a Health Innovation Council to act as a champion of NHS innovation, and indicated that funding would be available “... to identify, grow and diffuse innovation (5).” The document also announced Health Innovation and Education Clusters, linking health, education, and industry (5). Nine innovation hubs were aligned to the ten SHA regions (369). Other developments included the NHS Technology Adoption Centre (NTAC) (370), established 2007, which worked to increase the adoption of proven technologies (348), and the NHS Institute for Innovation and Improvement (NHSI) (371), established in 2005 and closed March 2013 (372). In 2013 NTAC became part of NICE (370) and was renamed the Health Technologies Adoption Programme (HTAP) (373). The 2009 report by the NHSI, *Organisational and Behavioural Barriers to Medical Technology Adoption* (348), which included process innovations, indicated the negative impact on patients of slow adoptions, and also pointed out that the NHS was perceived to be a slower adopter compared to health care systems in other developed countries, with frequent shortcomings in managing adoption and inconsistent decision-making (348). In addition, it was found: “*The knowledge and skills to seek, collect and analyse evidence for healthcare technologies are not widely available amongst senior NHS managers* (348).” Regional centres of NHS innovation had been developed, including in the South East in 2005 (374) and in the North (375) in 2001. These organizations support NHS employees with potential innovations, including matters such as intellectual property, patenting and commercialization.

In 2009, in response to a requirement set out by the 2008 report *Innovation Nation* (376), the Department of Health published a *National Innovation Procurement Plan* (369). The NHS Operating Framework 2009/2010 emphasised innovation (6) and a Commissioning for Quality and Innovation (CQUIN) payment framework was introduced “...to ensure that quality improvement and innovation form part of commissioning discussions (6).” These are locally agreed payment schemes incentivizing delivery of “quality and innovation improvements” (377). The researcher has found no evidence that CQUIN has been directed at primary care dentistry, and CQUIN is therefore not considered further.

The QIPP (quality, innovation, productivity and prevention) initiative, announced in 2009 (378), is a programme linking NHS quality improvements with efficiency savings (379). Innovation is seen as a way to achieve these, including in dental services (380). SHAs and PCOs were to have a role in supporting QIPP (107).

Equity and excellence: Liberating the NHS (2010) (107) stated that NHS reforms would “...liberate professionals and providers from top-down control.” It claimed this was “...the only way to secure the quality, innovation and productivity needed to improve outcomes (107).” The document also stated that in future “...any willing provider can provide services, giving patients greater choice and ensuring effective competition stimulates innovation and improvements... (107).”

Later in 2010 the government published *Healthy lives, healthy people: Our strategy for public health in England* (2010) (108), which stated: “We will end central control and give local government the freedom, responsibility and funding to innovate and develop their own

ways of improving public health in their area.” This report went on to announce Public Health England, which would “...*support local innovation, help provide disease control and protection and spread information on the latest innovations from around the world* (108).” *Developing the NHS Commissioning Board* (2011) stated that this board would promote “...*innovative ways of demonstrating how care can be made more integrated*”, and that there would be “*a culture which promotes research and innovation* (110).” *Securing excellence in commissioning primary care* (2012) recognized the role of “*innovative practice*” in commissioning (111).

In 2011 the government published its *Plan for Growth* (381), which stated a desire to see “...*an NHS defined by its commitment to innovation, demonstrated both in its support for research and its success in the rapid adoption and diffusion of the best, transformative, most innovative ideas, products, services and clinical practice*”. In response to *Plan for Growth* the NHS (2011) published *Innovation Health and Wealth. Accelerating Adoption and Diffusion in the NHS*, which drew attention to slow or incomplete dissemination, announced that a “*web portal*” for NHS innovation would be developed, and stated: “*We need to create a system for innovation that continually scans for new ideas, and takes them through to widespread use* (382).” The authors described barriers to NHS innovation as shown in figure 4 (382):

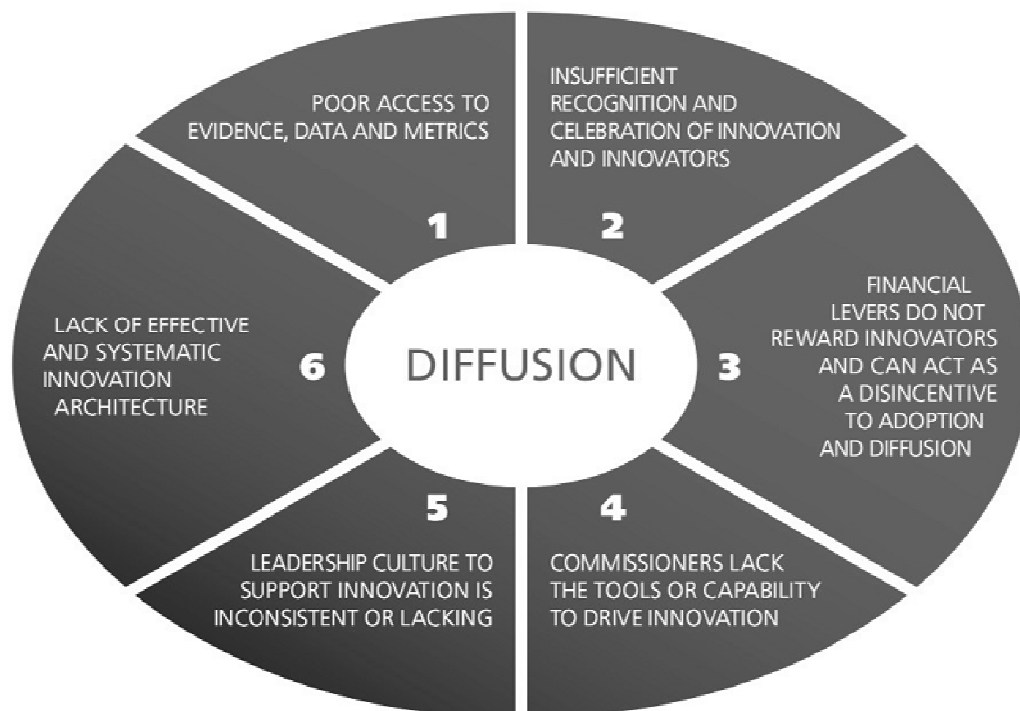


Figure 4. Barriers to NHS innovation. From Innovation Health and Wealth (382)

The report additionally suggested that the NHS Intellectual Property strategy should be updated because it could discourage sharing, and stated that there should be “...*more accessible evidence and information about new ideas* (382).” The report announced the development of Academic Health Science Networks (AHSNs), which would act as an innovation “*gateway*” for local NHS organisations and would also support “*knowledge exchange networks*” (382). A website was published under the brand “*Innovation Health and Wealth*” aiming to enhance dissemination and adoption of “*High Impact*” innovations (383). In 2013 the NHS Commissioning Board published a *Catalogue of potential innovations* (383).

Securing excellence in commissioning primary care (2012) stated an aim for “...constant flows of information between local and national teams (111).” The 2012 and 2013 editions of the NHS Constitution (112,113) stated that the NHS had a “commitment to innovation.”

There may be an “information paradox” where modern communications may either improve or reduce, through overwhelming volume, the accessibility of relevant information (384).

The development of a National electronic Library for Health (NeLH) was seen as a solution (384). Its function is now performed by the NHS Evidence Search facility (385), launched in 2009 (386).

The 2012 Department of Health document *The Power of Information* (387) announced:

“There will be a single comprehensive online ‘portal’ provided by Government from 2013, as a link to trusted information on health, care, support and public health (387).” Better information-sharing was described as “...critical to modernising care (387).” Public Health England has a *data and knowledge gateway* (388) as a beta web-site, although at January 2015 it contained no specific oral health resources.

CHAPTER 5: RATIONALE, AIMS AND OBJECTIVES

5.1 Rationale for research

On attempting to explore the strategic role of innovation in reducing oral health inequalities in English PCOs, the literature review uncovered little research on PCOs, on the role of PCOs in reducing oral health inequalities, and on both strategy and innovation as they related to PCOs. These domains therefore became the research foci of this thesis. Additional factors were the priority NHS policy was placing on reducing oral health inequalities together with indications that this was not working. Research was required to determine the veracity of this and to determine factors that might need addressing. There was also an NHS emphasis on innovation, but research was required to explore how this took place at PCO-level.

5.2 Research aims

1. To investigate the role of PCOs in addressing oral health inequality in England.
2. To explore the interaction between strategy and innovation in addressing oral health inequality.

3. To develop an understanding of how innovation aimed at addressing oral health inequality took place in PCOs in England.
4. To determine whether there is a role for local-level innovation in addressing oral health inequality.

5.3 Research objectives

Corresponding aims are displayed in brackets.

1. To explore the views of PCOs towards oral health inequalities (aim 1).
2. To examine and compare secondary data-sets relating to addressing oral health inequality at the PCO level (aim 1).
3. To determine the availability and distribution of OHSs across all PCOs in England (aim 2).
4. To explore the views of CsDPH on strategy and innovation to address oral health inequality at the level of the PCO (aims 1, 2, 3 and 4).
5. To obtain the attitudes of CsDPH towards strategy and innovation to address oral health inequality at the level of the PCO (aims 1, 2, 3 and 4).
6. To explore the views of CsDPH on the process of innovation aimed at addressing oral health inequality at the level of the PCO (aims 1, 3 and 4).

CHAPTER 6: METHODOLOGY

More detailed methodology accompanies the presentation of each study across chapters seven to twelve.

6.1 Qualitative

Qualitative approaches allow exploration and interpretation of factors such as meanings, opinions and attitudes not readily uncovered by quantitative research (389). Qualitative research and subsequent interpretation involve inductive reasoning (389). Such reasoning inherently does not lead to certainties, as is generally claimed for deductive reasoning (390).

6.1.1 One-to-one interviews

Interviews are often semi-structured based on a loose structure of open questions allowing divergence into more detail where helpful (391). Such interviews may explore fewer areas but in greater detail (391) and are suitable for generating in-depth personal accounts, understanding personal contexts, and exploring areas in detail particularly where issues are complex or delicate (392). Interviews, along with other techniques, have the difficulty of determining between public disclosure, or an official response, and private disclosure which might be more sensitive (393). Private disclosure may not, however, be any more valid

(393). Interviewees might assess the interviewer in terms of their institutional allegiances and presumptions about the research (393).

6.1.2 Group-based discussions

In this thesis the term group-based interview is used to encompass both focus groups and interviews with pre-existing groups. Pre-existing groups (394) differ from focus groups as participants are not purposively selected (395,396).

Focus groups

The focus group has been described as a “*formally constituted, structured group which is brought together to address a specific issue within a fixed time frame, and in accordance with clearly spelled out rules of procedure*” (396). Focus groups (397) are useful where group interaction may generate data (392,397) or where a one-to-one interview would be an unfamiliar experience (391,394). Through discussion individuals can refine what they have to say (392). A degree of homogeneity is advantageous so that detailed discussion can be understood by all (394). However, some heterogeneity is desired in order to reveal diverse views (394). Focus groups typically involve six to eight people (394). However, size can depend on the subject, the anticipated participant interaction and the breadth or depth of data required (394). Focus groups may be used as an initial stage to reveal issues which can then be explored with depth interviews (392,397). Focus groups can also be conducted after one - to-one interviews (392,397).

Pre-existing groups

It may be the case that a group which already meets may be a useful source of data. The advantages of group dynamics applicable to focus groups are retained, with some differences. Past shared situations and experiences may promote discussion and data may be revealed that might not be revealed if strangers were in the group (394 p. 192).

Disadvantages include the dominance of group norms, issues not being elaborated because they are taken for granted, and the effects of group hierarchy (394 p. 192).

6.1.3 Qualitative analysis

Grounded theory

Grounded theory, developed by Glaser and Strauss in the 1960s (398), involves collecting data and allowing ideas and theories to develop as data are collated. It does not use preconceived logically deduced hypotheses or preconceived theoretical frameworks. “*The initial decisions for theoretical collection of data are based only on a general sociological perspective and on a general subject or problem area*” (398). It is especially useful in situations where little is known about a research area.

Grounded theory uses a “*constant comparative method*” (399) of “*joint coding and analysis*” (399), whereby each section of data is compared with every other part throughout the study looking for similarities, differences or connections. “*Advancing theory development*” allows a provisional hypothesis to be developed from early data, which can be

adjusted as further data are collected. “*Theoretical sampling*” is aimed towards the development of theory and not population representativeness (398). Hence, sample size and types cannot be determined until the research is completed (398). Data are collected until categories are “*saturated*” (398), with similar instances occurring repeatedly, despite attempts to stretch the diversity of data sources (398).

Framework approach

The framework approach (400) is similar to template analysis, where the researcher starts with an *a priori* coding template, which is then verified and can be modified as data are collected (401). This type of approach is useful where the domains to be explored are known in advance. The framework approach is therefore useful where preceding research or literature can guide subsequent research (402). The conceptual overlap between template analysis and a framework approach is permitted by the wide-ranging definition and flexibility of the former (402).

6.2 Quantitative methods

Quantitative methods are appropriate for addressing issues where numerical measurement, mathematical relationship or statistical analysis is desired, with knowledge acquired mainly through a process of deduction (389).

Quantitative research, unlike qualitative research, involves mathematical models where “...*phenomena can be reduced to empirical indicators which represent the truth*” (403) and

where there is perceived to be an objective reality independent of human perception (403). In order to objectively analyse causal relationships randomisation, blinding and highly structured protocols are used. Sample sizes are larger than in qualitative research as representativeness is more important.

Quantitative research methods can be classified into four categories: descriptive, correlational, quasi-experimental and experimental (404). Experimental and quasi-experimental methods examine cause and effect by observing differences in dependent variables with changes in independent variables. Descriptive and correlational studies observe variables without researcher-imposed manipulations.

6.2.1 Measuring deprivation and inequality

Currently used indices of deprivation are the “*indices of deprivation 2007*” (405), which were created by the Department for Communities and Local Government. This contains the Index of Multiple Deprivation 2007 (IMD2007) which provides data down to the scale of Lower Super Output Areas (LSOAs) of populations between 1,000 and 3,000. These are often smaller than wards, thus allowing closer analysis. The IMD is based on 38 different indicators relating to different aspects of deprivation.

Other indices have been used in the past, including the Registrar General’s Classification (406), and the indices of Jarman (407), Townsend (4), and ACORN (A Classification Of Residential Neighbourhoods) (408). Health Equity Audit has been used as a tool for identifying inequalities, including in the provision and uptake of dental services (149).

It is also possible to demonstrate unequal distribution of a feature through a population. A useful method for comparing populations is the Gini coefficient (409), which ranges from zero (where a factor is equally distributed) and one (where one person has the entire selected factor and no one else has any). The Gini coefficient is derived from a Lorenz curve (410) which is cumulative distribution plotted against cumulative population. If a feature is distributed equally there will be a straight line instead of a curve. Unequal distribution will result in a line curving away from the straight equality line. The ratio of the area between the curve and the straight line to the area beneath the straight line, defined as unity, represents the Gini coefficient. The Gini index is the coefficient multiplied by one hundred.

6.2.2 Questionnaires and attitude measurement

Questionnaires, although variably defined (411), are a widely used quantitative research method (412 p. 243). Mailed questionnaires may elicit less socially acceptable answers (413) and can survey those not reached by an interview (413). Mailed questionnaires may be less expensive than qualitative methods such as interviews, but can be subject to low returns (414).

It is important that questionnaires are carefully constructed (411,412). Oppenheim (1992) draws attention to the role of statement or question sequencing and also to how questionnaires can be developed from findings derived from depth interviews (411).

Although there is no interviewer bias because generally no interviewer will be present during completion of a questionnaire, there is still the possibility that participants will perceive an

image of the person or organisation seeking information, which could affect responses (411). Additionally, responses cannot be checked and may be “*superficial*” (412).

The word attitude can be variably defined and different rating scales have been devised (412). A scale that has been used prominently is the Likert scale, with options for responses to statements typically ranging from strongly agree, agree, undecided, disagree, strongly disagree (412). Other scales exist, including the Thurstone scale and the Guttman scale, although these are considered more labour intensive (412). Much actual research usage is Likert-type scaling rather than Likert scaling in an attempt to avoid controversy over response categories having no objective numerical basis (415).

6.2.3 Parametric and non-parametric statistics

Statistical methods can be divided into parametric and non-parametric. Parameters stand separate to variables in equations, and parametric statistics refer to parameters, such as the mean and the standard deviation (416). Where data are not interval-based or ratio-based (for example a Likert-scale) non-parametric methods should be used instead. Such methods include Spearman’s rank-order correlation (417), which is used in this thesis for ranked data. Spearman’s rank-order correlation is a non-parametric version of the Pearson product-moment correlation, and can be used to measure the association between two ranked variables (417). Another non-parametric method used in this thesis is the Mann-Whitney *U* test, which is used to test a null hypothesis that one group does not have higher values than another (418).

6.3 Mixed-methods

The methodology used in the empirical component of this thesis was mixed-methods, as dictated by the research aims and objectives, with qualitative approaches (389) used for experiential data and quantitative approaches for numerical and statistical data. The researcher is aware that quantitative and qualitative methods were seen by Sale *et al.* (1992) (403) as “*incommensurate*” because they derive from different ontological or epistemological paradigms. However, Sale *et al.* (1992) (403) concluded that “*seeking complementarity*” between research components that were qualitative and quantitative was “*...both philosophically and practically sound....*” and therefore acceptable.

6.4 Application of mixed-methods methodology to this thesis

Studies 1A, 1B and 1C, collectively comprising study 1, overlapped chronologically because they explored different domains in support of the first research aim of investigating the role of PCOs in addressing oral health inequality (interviews for study 1A commenced September 2009 because of a delay. The first interview was originally scheduled for May 2009).

Study 1A was aimed at exploring the views of PCOs towards oral health inequality. It was decided that because the exploration of subjective views and gathering of experiential data required interaction between an interviewer and participants, this would be best achieved by

the qualitative approach of conducting one-to-one and group-based interviews. A combination of group-based interviews and one-to-one interviews in study 1A was considered desirable to take advantage of benefits of both approaches (389). Study 1B was aimed at exploring the availability of oral health strategies. It was decided that this could be done by using an internet search methodology. It was felt that findings derived from asking PCOs for OHSs would have been complicated by response rate, in that extant OHSs would be missed if a PCO did not respond. Study 1C was aimed at examining and comparing secondary quantitative data-sets in relation to oral health inequality at PCO-level. Study 1C was therefore inherently quantitative.

Studies 2, 3 and 4 were carried out sequentially. The variation in the presence of strategies aimed at addressing oral health inequality in study 1 had been unexplained. Subsequent to study 1, the researcher engaged with the NHS emphasis on innovation and decided that exploration of the role of innovation in PCO strategy to address oral health inequality could produce new knowledge. The researcher also decided that a wider consideration of strategy, beyond OHSs, could assist in developing new knowledge. In particular, this was supported by the concept of “*emergent strategy*”, as described by Mintzberg (1978) (280). It was therefore decided to conduct a second study (study 2) in order to focus on both strategy and innovation in relation to addressing oral health inequality. The aim of study 2 was to explore the views of CsDPH on strategy and innovation aimed at addressing oral health inequality at PCO-level. It was decided that because the exploration of subjective views and gathering of experiential data required interaction between an interviewer and participants, this would be best achieved by the qualitative approach of conducting interviews.

Study 3 was aimed at obtaining the attitudes of CsDPH regarding strategy and innovation aimed at addressing oral health inequality at PCO-level, and included emerged themes from study 2, such as variable conception of strategy and innovation and limitations to dissemination. Because this was an obtaining of attitudes, rather than an exploration of views as at study 2, it was decided that this should be achieved quantitatively, and an efficient way of doing this was by using a questionnaire. It was anticipated that the quantitative study 3 would complement the qualitative elements (interviews) (403). An additional benefit of undertaking a questionnaire was that it widened participation in the overall research. The undertaking of a questionnaire subsequent to analysis of qualitative data is consistent with a mixed-methods “*exploratory sequential design*” as described by Creswell and Plano-Clark (2007) (419).

Study 3 had shown that there were probable structural and process limitations impacting on the innovation process, from adoption through to dissemination. It was decided that this should be investigated further by conducting research based on exploring the views of CsDPH regarding the progress of single instances of innovation aimed at addressing oral health inequality. Study 4 was conducted to meet that objective. It was decided that because the exploration of subjective views and gathering of experiential data required interaction between an interviewer and participants, this would be best achieved by the qualitative approach of conducting interviews. The findings in study 4 were consistent with the main findings from studies 1-3.

Additional rationale, consistent with Britten *et al.* (1995) (391) for using a qualitative approach at studies 1A, 2 and 4 was that in each instance the relationship between domains

was little understood and potentially complex, involving decision-making and other processes, possibly with a range of underlying factors. Such inter-relationships, processes and underlying factors might not be detectable or explorable using quantitative approaches (389). In addition, the researcher wanted to explore subjective experiences. The researcher was aware of other potential qualitative methodologies, including direct observation and case studies. Direct observation was considered unsuitable as the researcher was looking at phenomena such as innovation and strategy that sometimes may have developed over long time spans. In addition, direct observation might not reveal views of individuals in the way that interviews can by posing appropriate questions. Direct observation can produce distorted findings (420), and might well also have been seen as an excessive intrusion into PCOs. Case studies were considered not to fit better than interviews with the research objectives of exploring views. In addition, it was felt that it might have been difficult to present case studies without breaching participants' confidentiality. The qualitative elements of this thesis were designed and conducted in accordance with NICE guidance (421).

Although several categories of person or organisation may have a view on oral health inequality, priority was given to those whom it was felt could provide information most relevant to the research aims. These were those with expert professional knowledge who worked in PCOs. CsDPH were therefore a focus of this research, but with additional job roles included in study 1A.

In study 1A, arranging successful group-based interviews had proved difficult. It was considered more fruitful in studies 2 and 4 to focus on one-to-one interviews with professionals in PCOs with relevant expert knowledge (CsDPH). It was also felt that these

individuals were best placed to know the details of relevant innovations that had taken place in their PCOs. The *Person Specification* for CsDPH at 2011 included as “*essential*”: “*Experience of achieving innovation and change*” (422).

In study 1A, data analysis and coding, along with decisions for further interviews, was based on a grounded theory approach although, unlike grounded theory (398), there was a prior understanding of which domains the researcher intended to explore. Analysis in studies 2 and 4 was based on a framework approach (400) because the researcher was investigating particular domains, whilst being open to new information beyond these.

Quantitative approaches included bringing together numerical data from different sources and applying statistical methods, an analysis of the availability and distribution of OHSs across PCOs and SHA groupings, and a questionnaire distributed to all CsDPH.

Greenhalgh *et al.* (2004) highlighted domains where further health care innovation research might be needed, which are therefore included in this research, and those where probably no further research was required, such as barriers presented by inadequate workforce or funding (303). Potentially beneficial research domains included a focus on process, engagement with “*on-the ground*” individuals, a focus on how innovations arise, the relationship with health service restructuring, and the nature and extent of social networks and interpersonal factors, including the role of boundary spanners (303).

Donabedian’s structure, process and outcome model of quality in health care (1) (423) was considered a useful analytical tool. This model suggests that structure influences process and

process influences outcome, although these influences are probabilistic. The topic guide for study 1A was formulated with Donabedian's model in mind. This was not necessary for studies 2 and 4, as the domains to be investigated inherently covered structure, process and outcome, although it continued to be a useful analytical tool.

6.5 Using dialectic and functional approaches

Where contradiction or inconsistency was observed, development of the discussion section was supported by dialectic and functionalist approaches (see Appendix 13). A dialectic approach has been used previously in innovation (424,425) and strategy (426) research, which suggested applicability to this thesis, because contradictions and inconsistencies were observed. Dialectics (427) can involve viewing circumstances as a "*thesis*" with an opposing or inconsistent "*antithesis*", and with the potential for a "*synthesis*" to develop, which at least partially resolves the contradiction, tension or inconsistency (427). This is the concept of dialectics applied in this thesis. Other concepts of dialectics exist (428).

Where there were contradictions, tensions and inconsistencies it was considered that the functionalist approach described by Blau (1955) (429) could assist in analysing whether these represented functions, latent functions or dysfunctions for the organisational system (429). The discussion therefore includes suggestions of function, latent function or dysfunction. A dysfunction is taken to be that which reduces the adaptation or adjustment of a system and a latent function is taken to be unanticipated consequences that contribute positively to system adjustment (429). The overall system in this research is the NHS. The

researcher acknowledges that post-2013, following the creation of Public Health England (276) and the involvement of Local Authorities, a different overall system would apply.

Donabedian's model (1), and dialectic and functional approaches are all based on inductive reasoning (390) and therefore outputs are inherently uncertain (390).

6.6 Ethics and data security

The ethical implications of the study were carefully considered. Because the research would have minimal impact on participants, the researcher or the University, and no participant would be identifiable, it was decided that formal ethical approval would not be required. No participant was defined as vulnerable and there was no expectation of any psychological stress or anxiety as a result of this research. Participation was entirely voluntary. Secondary data-sets were available in the public domain, and availability of oral health strategies was derived from information available in the public domain. Although ethical approval was not required by the University at the time of these investigations, retrospective approval has been sought for future purposes.

For all interviews, the source of funding for the research was declared along with the reasons for conducting it. Confidentiality was assured in that information obtained would not be attributable to any particular person or organisation. Interviews were recorded on a voice recorder, except CDPH7 in study 4 who did not wish to be recorded, after explanation of the reasons for this and consent being obtained. Voice recordings were removed from the recorder at the earliest opportunity and stored in password-protected .zip-files on a machine

with a password-protected operating system at the researcher's home. Transcripts and NVivo files were stored in the same way. Identifying information was removed from transcripts. Returned questionnaires, although anonymised, were stored in a locked cabinet at the researcher's home.

CHAPTER 7: STUDY 1A – EXPLORING THE VIEWS OF PRIMARY CARE ORGANISATIONS TOWARDS ORAL HEALTH INEQUALITY

7.1 Methodology

The one-to-one and group-based interviews were conducted between September 2009 and February 2010. One-to-one interviews were conducted between September 2009 and February 2010. The focus group was conducted in September 2009. The interview with a pre-determined group was conducted in October 2009. The timing of group-based interviews was largely down to opportunities that arose to hold these. Perceived (by the researcher) limited opportunities to hold group-based interviews meant that opportunities were taken advantage of when they arose. Interviews were recorded on a voice recorder after explanation of the reasons for this and consent being obtained. The recordings were transcribed verbatim and the transcripts were imported into NVivo8, a qualitative research software tool from QSR International (430). Transcripts and analysis were validated by a second researcher.

7.1.1 Sampling

The first group-based interview was a focus group (395,396) consisting of purposively selected individuals from a restricted range of individuals attending an event This event was

not focused on oral health inequalities. Participants were chosen because of their potential senior role in addressing oral health inequality, and therefore included CsDPH. Two individuals from PCC also volunteered. It was considered that they would add to group heterogeneity, and that their close working with PCOs might indicate that they held relevant information. They were therefore included in the focus group. This focus group took place because the researcher was aware that the event was taking place, and that relevant individuals would be present. The second group-based interview was with a pre-existing group (394) during a work meeting, and also differed from the focus group in that its composition was pre-determined, thereby not meeting definitions for a focus group (395,396). The work meeting was not focused on oral health inequalities. The sample for the pre-existing group was therefore opportunistic. Sampling for one-to-one interviews was purposive with heterogeneity sought in terms of practicing demographic variation, rurality, gender and experience. One-to-one interviews with CsDPH took place because the researcher felt that CsDPH were best placed to provide information relating to PCOs' addressing of oral health inequality. Sampling ceased when it was believed saturation had been achieved, despite having attempted to maximize participant diversity.

The number of overall participants in study 1A was not set at the outset. It was desired that group-based interview samples would be heterogenous, in order to observe a range of views and promote discussion, but with some homogeneity to preserve understanding of the issues across the groups. Heterogeneity was achieved in both group-based interviews (see table 1). Table 1 shows interview participation across studies 1A, 2 and 4.

Table 1. Distribution of participants in one-to-one and group-based interviews, including interview set.

	Study 1A	Study 1A	Study 1A	Study 2	Study 4
Participant	Focus group on oral health inequalities	Group interview on oral health inequalities	One to one interviews on oral health inequalities	One to one interviews on strategy and innovation	One to one interviews based on individual innovations
CDPH1	Yes	Yes	Yes	Yes	Yes
CDPH2	Yes		Yes	Yes	
CDPH3			Yes	Yes	Yes
CDPH4			Yes	Yes	Yes
CDPH5			Yes	Yes	
CDPH6				Yes	Yes
CDPH7				Yes	Yes
CDPH8					Yes
CDPH9					Yes
HPC1		Yes			
PCA1		Yes			
PCA2		Yes			
PCC1	Yes				
PCC2	Yes				
PCM1		Yes			
PCM2		Yes			

CDPH = Consultant in Dental Public Health
HPC= Head of primary care in a PCO
PCA= Primary care assistant in a PCO
PCC= Primary Care Commissioning representative
PCM= Primary Care Manager at a PCO

An analysis of the characteristics of the CsDPH that participated in the interviews across studies 1A, 2 and 4 is displayed in Table 2. The locations of the focus group and the pre-arranged group are not revealed as this would help identify the CsDPH that took part in those.

Table 2 Characteristics of CsDPH participating in interviews across studies 1A, 2 and 4.

Gender		
	Male	4
	Female	5
Location		
	South	4
	*Midlands	3
	North	2
Population density		
	Predominantly urban	4
	Mixed urban and non-urban	5
Known to have an academic position at the time of research		
	Yes	2
	No	7
Years experience as CDPH as at Mar-May 2012		
	0 to 5	1
	5 to 10	1
	10 to 15	4
	15 to 20	2
	over 20	1
PCO (boundaries as at October 2006) IMD (2007) score rank as at 2005		
	1 to 30	3
	31 to 60	1
	61 to 90	2
	91 to 120	3
	121 to 152	1

Note: where a CDPH worked in more than one PCO, and those PCOs were in different ranking bands, that CDPH is recorded twice. This occurred once. Hence the sum of the entries is 10, not nine.

* The Midlands is defined as Shropshire, Staffordshire, Derbyshire, Nottinghamshire, Lincolnshire, West Midlands, Herefordshire, Worcestershire, Warwickshire and Northamptonshire

7.1.2 Topic guide

The topic guide, included at Appendix 1, was informed by the literature review. The topic guide was also developed with reference to Donabedian's model of structure, process and outcome (1), but also included other elements that were considered relevant by the researcher. These were definitional issues around the terms used, and also the level of importance attached to the problem of inequalities. The topic guide was piloted at a one-to-one interview. It was accepted that the topic guide could be refined as the study progressed; this was not found to be necessary. The group-based and face-to-face interviews were semi-structured in that diversions from the topic guide into areas that might produce relevant data were permitted.

7.1.3 Participation

One-to-one interviews

All four one-to-one interviews were conducted face-to-face with CsDPH at their places of work. An initial one-to-one interview had the dual purpose of both gathering data and piloting the topic guide. Three further one-to-one interviews were conducted. All interviews were approximately half an hour in duration.

Focus group

Present at the focus group were two CsDPH, two employees from PCC and the researcher. The focus group was held in a break in proceedings of an event that the participants were attending. It was held in a communal refreshment area. The duration was approximately one hour with no rigid pre-determined time limit, although they expected to re-attend their meeting at some point.

Pre-existing group

The participants were a Head of Primary Care at a PCO, two PCO dental commissioning managers, one CDPH, two primary care assistants and the researcher. Nine further primary care assistants were present but did not participate although they were permitted to. It was held at an office of the PCO, in a meeting in which time had been set aside. The duration was approximately half an hour, which complied with the expectations of the PCO.

7.1.4 Analysis

Transcripts from the focus group, the pre-determined group and the one-to-one interviews were included in a single analytical process. Transcript analysis was based on a grounded theory approach although, unlike grounded theory (398), there was a prior understanding of domains to be investigated. Transcripts were analysed using the constant comparative method (399) until categories emerged. Analysis commenced with open coding with the interviews analysed line by line. Once codes were developed they were grouped into categories. It was desired that saturation of the emergent categories would occur (398), despite attempts to stretch the diversity of data sources (398), whilst acknowledging that further research may be required to achieve this. Sampling ceased when no new categories

were emerging from the analysis of the transcripts. Transcripts and analysis were validated by a second researcher. It was necessary to redact some elements of the transcripts where there was a potential risk of participant identification. These included places of work or references to named individuals.

7.2 Results

The main themes to emerge from the interviews were:

- Staffing issues.
- Hierarchical and political issues.
- Changing behaviour in the general public.
- Oral health promotion.
- The re-design of how services are provided.

7.2.1 Staffing issues

Participants reported that the limited number and availability of CsDPH was a problem in tackling inequalities in oral health. A CDPH was seen as important in providing expert knowledge and advice, but potential workload for CsDPH may outstrip the time available. These points are illustrated by the following:

“There’s not enough of us, no.” ^{CDPH5}

“...and we rely and depend on [CDPH1] who is a rare being anyway. Trying to get a consultant in oral health into your PCT is a challenge.” ^{HPC1}

“...so an expert working in each PCT to advise them what to, working with them as a team, I think is so key that the capacity within PCTs is the biggest issue I think.” ^{PCC1}

“I'm thinking when am I going to get round to the smoking cessation, oral hygiene, oral health promotion in, working across different sectors, working with the council, working with public health colleagues, smoking cessation, the exercise and healthy eating agenda that we could try and market through dental practice and all that stuff? If I sat with a clean piece of paper I'd say these are the things I should be doing and actually at the end of the year I think, well, I look at my strategy and I haven't done that, I haven't done that, I haven't done that, I haven't done that, I haven't done that, I haven't done that.” ^{CDPH1}

Participants reported other staffing issues, which included relevant experience, and turn-over of support staff within PCOs. These caused difficulties in dealing with unfamiliar problems and also created the possibility of mistakes being made. These concerns are illustrated by the following contributions:

“...you know you're just into the job with no knowledge of dentistry or maybe primary care or indeed of the NHS and suddenly you are in doing, you know, that work.” ^{PCC2}

“Things like not being given enough time to learn things as the new person comes in, straight away someone’s at them about something. And then it’s like blimey I haven’t got to grips with any of this yet but I’ve now got this huge issue to deal with.” CDPH1

“There is something about the turnover of people in PCTs, and, you know, dentistry is being left to in some instances quite, people who can be seemed to be quite isolated in the jobs they do, or maybe quite junior, and actually...it’s not easy.” PCC2

“And each time you have to start again, you know, there’s a learning curve and people then make mistakes or they aren’t moving things quickly and so I think there’s a continuity in terms of that and keeping the skills, keeping people on the jobs that they’re good at. And, you know, having to remunerate them accordingly to keep them there.” CDPH5

The loss of collective knowledge to the PCO when staff left was an issue. This problem was made worse by the limited number of people with appropriate knowledge available to be employed as support staff and also the possibility of deficiencies in written records. This was illustrated by:

“The knowledge goes. People aren’t there. People aren’t there in the market waiting to be employed with these types of knowledge.” PCC1

“And you can’t pick it up, if one person goes and as far as I can see in my limited knowledge of PCTs, which is like 5 years now, if something happened 2 years ago you won’t be able to

find anybody in that organisation who remembers what happened, nor would they have written about it.” CDPH2

“I think what we would like is organisational memory and continuity. You know, if you have somebody, if you have a commissioner, that you’ve been working with for a couple of years and they’ve got a real feel around how dentists work and the pressures of dental practice and, what are the issues around oral health and how it can be used in common risk factors? They really get that feel of it and you’re really working together as a team and then they’re gone.” CDPH5

7.2.2 Hierarchical and political issues

The pressure on PCOs to deliver on externally-set targets, such as increasing the number of people visiting a dentist over a 24-month-period, emerged as a problem in that there appeared to be a tension between such externally-set targets and PCO desire to improve oral health and reduce inequalities. This is illustrated by:

“There is huge tension; there is huge pressure on PCTs to deliver on the figures.” PCC1

“‘X’ proportion of people accessing dental services, otherwise you are failing...You’ll be named and shamed. It doesn’t bode well and that’s the key frustration we have.” CDPH4

“As a team I have to say we have struggled with this policy because our driver was always oral health...but my team now will talk about access and getting the figures back to what they were when they were high and making sure that the numbers of people can go....” PCC1

“...and if one span of the department of health is telling you to choose better oral health and all the other nice documents to reduce inequalities, and some of the actions you have to do to do that, and you say yes we can do that, but on the other hand they are saying no, no, no - UDAs [Units of Dental Activity], you got to deliver UDAs, targets of 260,000 UDAs, and you’ve got to deliver it.” CDPH4

“We look at how many bums on seats we’re getting rather than quality of services and what services do we need?” CDPH5

It emerged that SHAs relevant to the PCOs involved in this study may not manage the performance of PCOs for reductions in inequalities in access or reductions in inequalities in oral health:

“Specifically, I don't think we are externally managed in terms of reducing inequalities. We are performance managed in terms of vital sign and have we spent our money?” CDPH1

“Oral health generally no, they’re very much more hands off.” CDPH3

There was a tension between the local autonomy of PCOs to provide dental services, and the required compliance with directions from higher NHS bodies. The balance appears to be more towards central control than local, PCO-level, autonomy. This is illustrated by:

“.....there was a lot of talk about local commissioning, about PCTs making the decisions, but the PCTs cannot make decisions; you are told what to do. That is a big frustration. So in terms of inequalities that is a big, big barrier.” ^{CDPH5}

7.2.3 Changing behaviour in the general public

The perceived difficulty for a PCO in changing health behaviour is illustrated by the following contribution:

“I mean, whether we actually can influence people's behaviour is, I mean, everything it tells us is it is a very difficult thing to do and maybe we can't influence behaviour at least not in the short term.” ^{CDPH1}

Another issue was the perceived difficulty of changing public behaviour regarding dental attendance in that new services might be provided but this might not be followed by anticipated uptake. People still may not wish to visit a dentist because they have no desire to do so or they do not perceive a need:

“There’s lots of reasons why people don’t go to the dentist...so even just setting up another practice, a new practice in a deprived area where there isn’t one doesn’t mean that you’ll get people to go.” PCC1

“There are issues of the cultural aspects. A lot of it is around low perception of need, for certain cultures dentistry, they don’t see it as a problem unless you have a raging tooth ache and so they will not willingly go even though those services are available.” CDPH4

“You could provide a dentist down the road and people still wouldn’t use them. If they don’t want to go to the dentist they won’t go. So saying, oh yes we’re going to have 95% coverage and you know, well, that’s great but only 60% want to go.” CDPH5

The difficulty of health behaviour change was reflected in the potential uptake of new services. This is illustrated by the following:

“You know that PCTs seem to have this idea that they are going to open new services in areas where no dentist has ever put a business. They are going to find that no one actually turns up.” CDPH1

“Where you have them available you have got to encourage uptake of those services. I mean we had, it’s a lot better now, situations where we had capacity within practices but people were not turning up.” CDPH4

7.2.4 Oral health promotion

Oral health promotion programmes were seen as a possible means of reducing inequalities in oral health. The association between smoking and oral health was also a recurrent theme as was the integration of oral health promotion with general health promotion. This is illustrated by the following:

“So everything you can do in oral health promotion we are trying to do.” CDPH2

“Perhaps we could say one of the biggest things we could do to improve oral health and to change behaviour is smoking cessation and actually all put our shoulders to the wheel everyone collectively in an integrated way can try perhaps stop smoking. Maybe that is the thing we really should be striving for, so when you go to the dental practice you get as much challenged about your smoking as you would if you went to your doctor.” CDPH2

“...and we have a bit of a challenge in making sure that any oral health messages we’re giving tie in with our general health messages and of the two I think the general health messages are a priority message so we have been doing a lot of work to make sure that our oral health promotion units are linking with our general health promotion messages....”

CDPH3

7.2.5 The re-design of how services are provided

A theme was that certain segments of the population may require services to be tailored to their specific requirements. This may require research into what types of services people want. This is illustrated by:

“What we ought to do is about service redesign, about thinking around getting services which are more appropriate to that community.” CDPH1

“...trying to identify what the people think their needs are. That’s one of the key things. You’ve got to find out what the people think they want and then run a tailored service that’s applicable to all.” CDPH4

CHAPTER 8: STUDY 1B - AVAILABILITY OF ORAL HEALTH STRATEGIES

An assessment of the availability of OHSs was considered feasible as, in the event that a strategy had not been published on a PCO web-site, it remained that the strategic direction of the PCO was set by the PCO board, and board agendas, papers and minutes are also available on PCO websites, and reference to such a strategy should therefore have been available there. This section of the overall research was conducted in June 2009.

8.1 Methodology

8.1.1 Criteria for inclusion

For inclusion, a document had to contain policy, plans, or strategy to address oral health inequality and not just access inequality, in accordance with the duties of PCOs regarding dental public health (122). OHSs which had a defined end date prior to June 2009 were determined to be no longer valid. Any document with an end date of 2009, with no specific expiry date within that year, was taken to be valid for the whole of 2009. OHSs that appeared open-ended or appearing as being intended as a continuously developing document were included. Any OHSs found from PCOs that ceased to exist after the 2006 PCO consolidation were not included. Strategies from PCOs with name changes post-2006 (not

affecting their boundaries) were accepted, even if the strategy bore the prior PCO name. The title was not relevant. Those documents not titled “*Oral Health Strategy*” (OHS) but which met the acceptance criteria of this study for an OHS, will be referred to henceforth as OHSs. If PCO board papers and minutes suggested that an OHS had been approved by the PCO board, but the strategy could not be accessed, this strategy was included. Results with these non-accessible strategies removed from the analysis are also presented. Documents that presented only access or distance standards or applied only to children, or other population sub-groups, were excluded. OHNAs that contained policy recommendations were not included, as OHNAs were considered to be a stage prior to developing an OHS.

8.1.2 Search methodology

As in Chestnutt’s methodology (431), various search technologies were used to obtain data from the web. Two search engines (Google (432), Yahoo! (433)), a directory (Yahoo! Directory) (434) and a Multiple Search Engine (MSE), Vivisimo’s Clusty (435), were used. Google is the most used search engine (436) and is also probably the largest (436), although “...size [is] *not disclosed in any way that allows comparison*” (436). As range of search was considered important, Google was used first, followed by the Yahoo! search engine, in accordance with recommendation (436). A MSE was included to help cover gaps in searches (437). Vivisimo’s Clusty was selected as it had no cross-over with the other search tools; it gave the top results from: Ask, Gigablast, Live, NY Times, Open Directory, Yahoo! News and “*sponsored listings*” (438). A MSE was not used as the sole search tool as there is evidence that more data may be obtained if individual search engines are used separately (439).

Search terms were:

“oral health strategy”

“oral health strategy” “PCT”

“oral health improvement and dental commissioning strategy”

“dental strategic commissioning framework”

These terms were based on known or likely titles.

Search tools were utilized in the order of: Google, Yahoo! web search, Yahoo! Directory search, Clusty meta- search. The first 400 results for each search were inspected.

The second phase was to examine the websites of those PCOs which remained with no strategy after the utilization of search tools. Each PCO website was accessed and the following methodology applied:

1. The “*search*” box (if available) was located and the search terms listed above (except *“oral health strategy” “PCT”*) were inserted and searched for.
2. The “*sitemap*” facility (if available) was located and utilized in order to search for OHSs.
3. The homepage was inspected for any link to “*publications*”, “*strategies*” and “*policies*”.

These links were examined and OHSs were looked for.

4. Board meeting agendas and listings of board papers were analysed. The analysis went back to the first PCO meeting with documents available online. Where an OHS was only available as a paper at a board meeting (i.e. not published by the PCO on its website), the

minutes of the subsequent meeting were analysed in order to verify that the strategy had been approved.

8.1.3 Analysis

OHS availability was analysed against SHA groupings of PCOs and against deprivation ranking of PCOs derived from IMD (2007) scores (440), which relate to deprivation in 2005, but are presented for PCO boundaries as after the consolidation of PCOs in 2006.

8.1.4 SHA analysis

The role of SHAs was outside the scope of this study. However, an analysis limited to websites was conducted in order that information might be gained that might help explain any variation in OHS availability by SHA grouping. Each SHA website was analysed between 20th and 30th October 2009.

For each SHA website the following was carried out:

Any “*search*” box was entered consecutively with “*oral health strategy*”, “*oral health strategies*”, “*oral health*” “*oral*”, “*dental*” and “*dentist*”. If a “*sitemap*” facility was available, the contents of this were inspected next. Subsequently, publications available on-line were searched using the same terms as for the “*search*” box. Subsequently board meeting agendas and papers were analysed for references to PCO OHSs.

8.2 Results

Fifty five out of the 152 PCOs in England had an OHS, dental commissioning strategy, or a policy paper which fitted the inclusion criteria of this research. There were no examples of documents described as oral health strategies by the host PCO which did not fit the criteria, other than being out of date.

A wide variation was found at SHA level with 87.5% of PCOs in North West SHA having an OHS whereas only 9.7% of PCOs in London had an OHS that met the criteria for inclusion. The variation at SHA level was statistically significant ($p \leq 0.05$, chi square value 31.6 on nine degrees of freedom). These data are presented in figure 5.

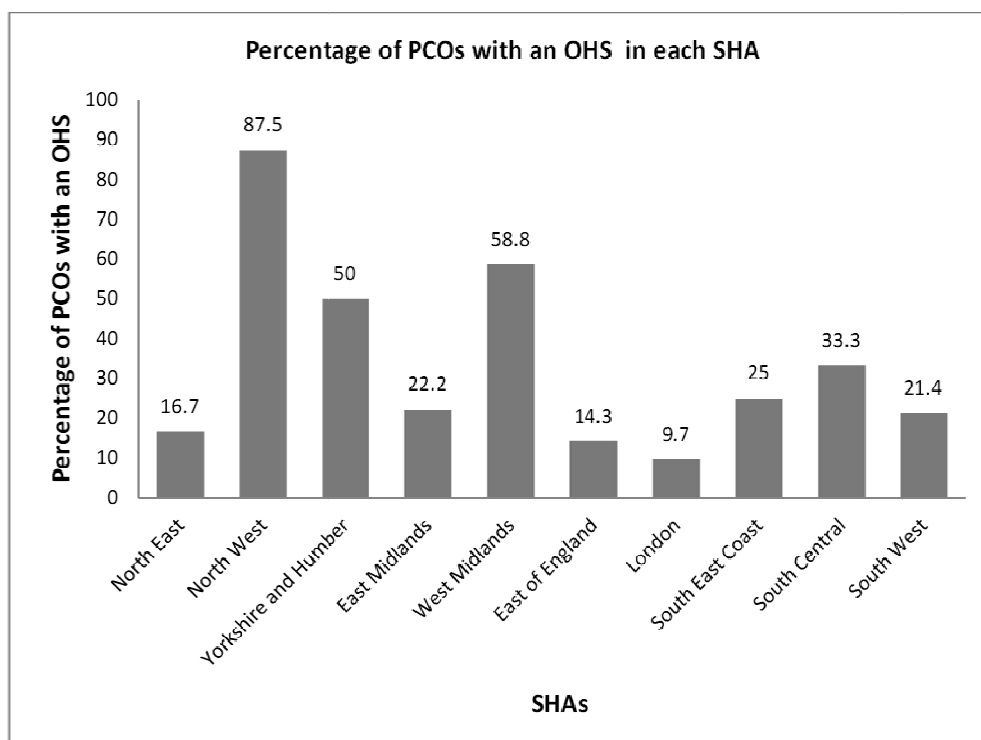


Figure 5. Distribution of OHSs that meet the acceptance criteria of this study across SHA areas.

The fifty five strategies include seven cases where the strategy documents could not be accessed for analysis of contents. These were included as there were board papers that demonstrated that these strategies had been presented to PCO boards and the minutes of the meetings showed that they had been approved, and the titles of the documents suggested an OHS. As all similarly titled strategies addressed inequalities in oral health as well as access it was considered unlikely that the seven unviewed documents would not. As a comparison the distribution of OHSs among SHAs was analysed with these PCOs removed and there was little difference in the variation by SHA ($p \leq 0.05$, Chi square 36.3 on nine degrees of freedom). For information, these data are presented at Appendix 2.

In both instances analysis allows rejection of a null hypothesis stating that there was no variation by SHA in the proportion of PCOs within those SHAs that had an OHS that met the study criteria.

Where board papers were resorted to, the dates to which published board meetings extended back to on PCO web-sites varied. The majority went back to the 2006 PCO re-organisation, but there were seven PCOs where published meetings went back less than one year. One of these had the details from only one meeting on its web-site. A further PCO had meetings going back 17 months but published on what appeared to be a random basis. Figure 6 shows the frequency distribution of OHSs across the range of IMD (2007) deprivation rankings, grouped in tens.

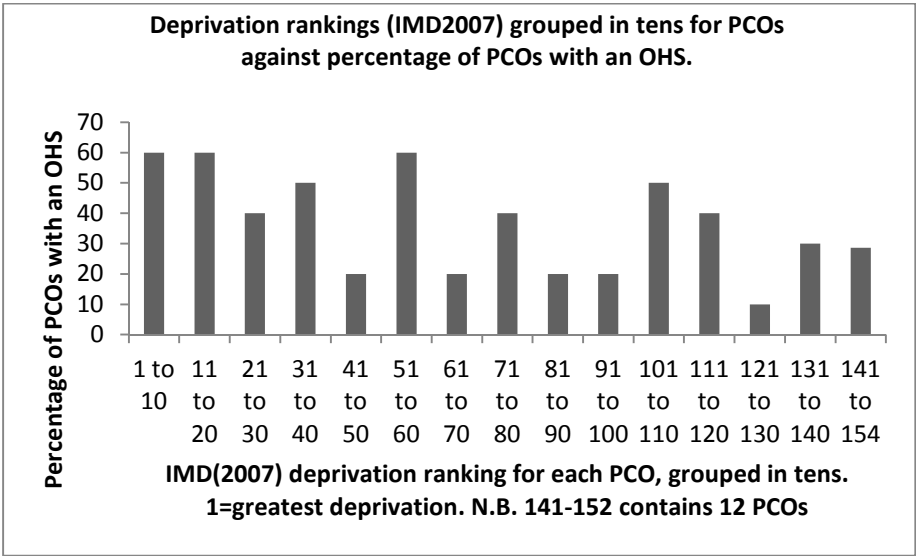


Figure 6. IMD (2007) deprivation ranking, grouped in tens, against percentage of PCOs with an OHS that met the acceptance criteria of this study.

The mean of the mean IMD(2007) deprivation scores for those PCOs with an OHS was 26.4 (95% confidence interval (CI) = 2.66); the mean of mean IMD(2007) deprivation scores for those PCOs without an OHS was 22.2 (95% CI = 1.69). A Mann-Whitney *U* test was conducted, with PCO deprivation values separated into groupings according to whether

PCOs had a strategy or not ($U=5245.5$, $Z=1.92$, P value (2-tailed) = 0.055). This result does not allow us to reject a null hypothesis stating that there is no significant difference in mean IMD scores between those PCOs that did have a strategy and those that did not.

No usable data were obtained by investigating SHA websites that might explain the distribution of OHSs at PCO level. Some SHAs mentioned oral health in their public documents more than other SHAs but nothing explicatory was found to attempt to explain the mal-distribution.

CHAPTER 9: STUDY 1C - SECONDARY DATA SETS RELATING TO ORAL HEALTH INEQUALITIES

9.1 Methodology

Secondary data-sets were analysed first individually and subsequently by comparing them with each other. This part of the research was conducted between May and October 2009.

The following data were utilized:

- UDAs commissioned for each PCO as at March 2009, obtained from Department of Health Dental Commissioning Monitoring (441).
- Mid-2008 population estimates for each PCO, obtained from the ONS (442). Population estimates were used to calculate UDAs commissioned per capita.
- Caries experience as shown by d₃mft (sum of decayed, missing and filled teeth, where decay is obviously into dentine using visual methods only (443)) in 5-year-olds, measured in the school year 2007/08 for each PCO area that participated in the Dental Epidemiological Programme (DEP) survey. The following PCOs did not participate and therefore all data below referring to d₃mft excludes these PCOs: Barking, Bexley, Greenwich Teaching, Harrow, and Havering (444).

- IMD (2007) deprivation scores as at 2005, adjusted for PCO boundaries as at October 2006 (440).

Data-sets from 2009 for commissioned UDAs were felt to correspond best with data from the 2007/2008 Childrens' Dental Health Survey because this was published, and therefore made available to PCOs, in 2009. The deprivation data were the most recent available.

Computations and statistical tests were carried out using Microsoft Excel 2007 (445), the web-based “*wessa.net*” facility (446,447) and Altman's *Practical Statistics for Medical Research* (448).

9.1.1 Individual secondary data-sets

Inequality for each data-set was assessed by computing the Gini coefficient (409) and presenting the Lorenz curve (410) for each. Both the Gini coefficient and the Lorenz curve have had prior application in the field of studying inequality (409,410). For each data-set, PCOs were ordered to show the distribution of the range of values. Dispersions around the mean were indicated by calculating standard deviations and coefficients of variation.

9.1.2 Comparing secondary data-sets

The secondary data-sets were compared and analysis was carried out for correlation.

Analysis was based on rankings and actual values. Actual values were used to see if different

conclusions could be drawn if the effect of ranking process was withdrawn. The analyses were on:

- Deprivation data against per capita commissioned UDAs
- Mean d₃mft data for 5-year-olds against per capita commissioned UDAs.
- Deprivation data against mean d₃mft data for 5-year-olds.

There has been previous research demonstrating an association between deprivation and caries, as described in the literature review. It would have been possible to proceed with the research on the assumption that an association between deprivation and caries was still present. However, the availability of secondary data-sets allowed this assumption to be tested.

9.2 Results

Results relating to the analysis of deprivation data against mean d₃mft data for 5-year-olds are presented at Appendix 6. This is because such results provide contextual information that does not relate to PCO activity in addressing oral health inequality. Results in Appendix 6 are consistent with other research in demonstrating an association between caries and deprivation. Frequency distributions referred to in the results below are attached at Appendix 5. This is because, although they provide context, they provide similar information to that presented here, but in a different way. For example, an impression of frequency distribution can be obtained from figures 7, 9 and 11.

9.2.1 Single secondary data-sets

Figure 7 shows English PCOs ordered ascending according to per capita UDAs commissioned, as at March 2009 (441). The range was 0.74 (Richmond and Twickenham PCT) to 2.7 (South Tyneside PCT). The mean (\bar{x}) was 1.67 (median 1.71) and the standard deviation (σ) was 0.32. This gives a coefficient of variation (σ/\bar{x}), indicating dispersion around the mean, of 0.19. Frequency distribution showed a tendency towards a normal distribution and a skew of -0.14 (Appendix 5, fig. 32)

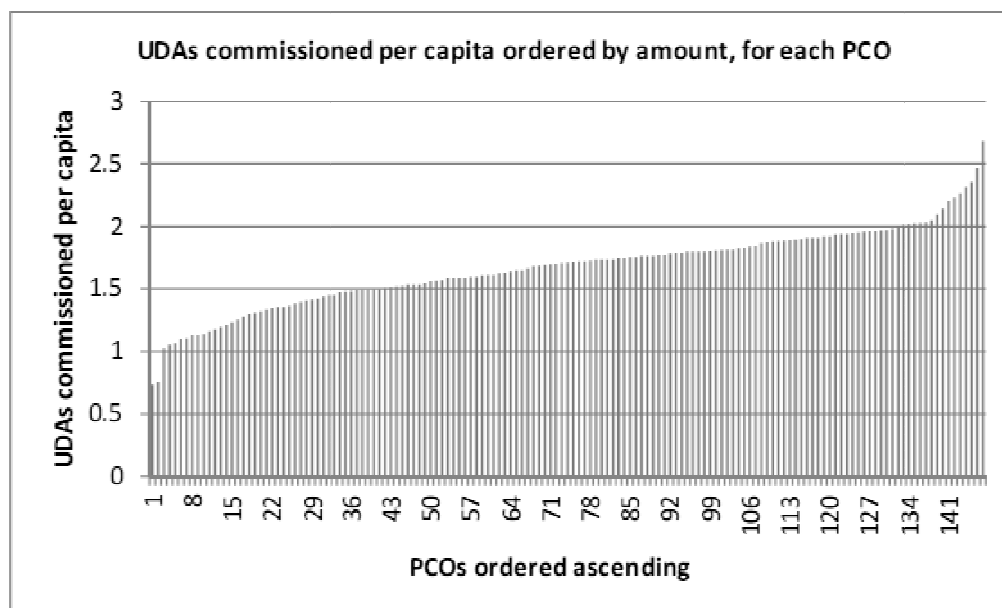


Figure 7. UDAs commissioned per capita, ordered ascending, for all English PCOs

Figure 8 shows the Lorenz curve for per capita UDAs commissioned as at March 2009, across all English PCOs. The Gini coefficient was 0.105.

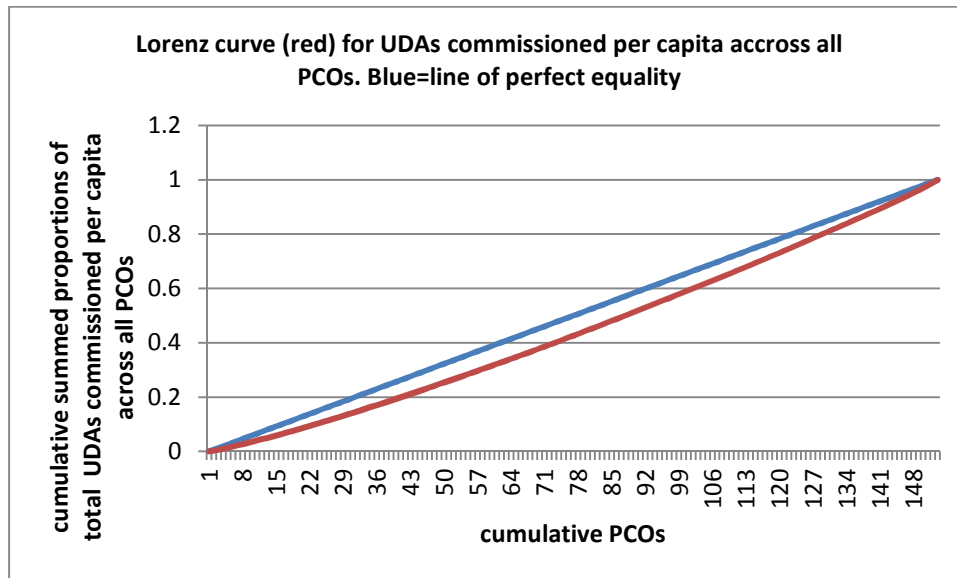


Figure 8. Lorenz curve for UDAs per capita commissioned, as at March 2009, across all English PCOs.

Figure 9 shows English PCOs ordered ascending according to their IMD (2007) deprivation scores (higher deprivation score indicates a greater level of deprivation) (440). The range was from 8.09 (Surrey PCT) to 48.26 (Heart of Birmingham Teaching PCT) The mean (\bar{X}) was 23.73 and the standard deviation(σ) was 9.14 with a coefficient of variation (σ/\bar{X}) of 0.39. Frequency distribution was approaching normal but with a significant skew (0.49) towards the lower values (Appendix 5, fig. 31)

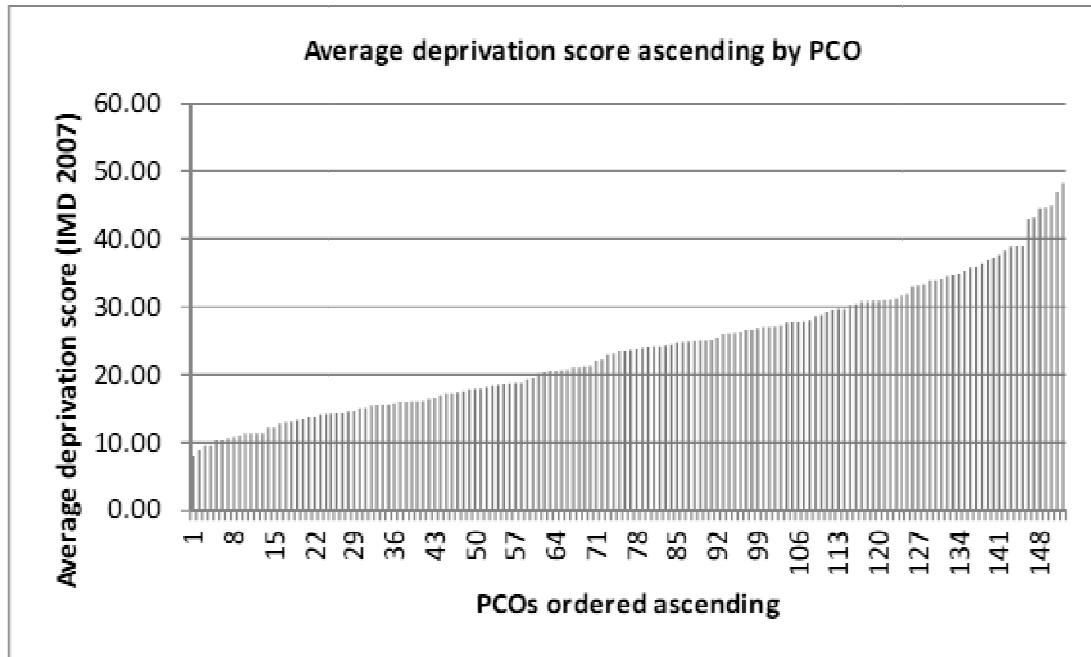


Figure 9. Average IMD (2007) deprivation score (highest score=worst deprivation) ordered ascending for all English PCOs.

Figure 10 shows the Lorenz curve for average IMD(2007) deprivation scores across all English PCOs. The Gini coefficient was 0.217.

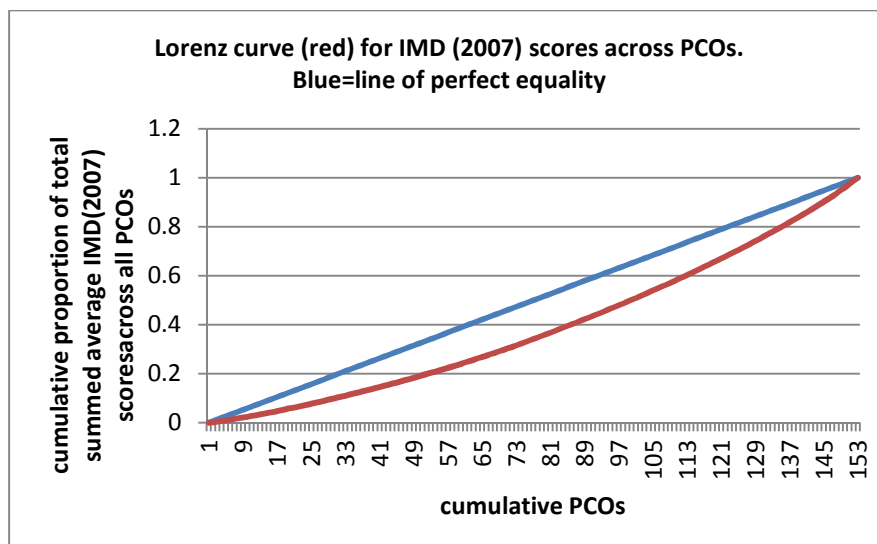


Figure 10. Lorenz curve for average deprivation score (IMD2007) across all English PCOs.

Figure 11 shows English PCOs ordered ascending according to mean d_3mft for 5-year-olds. The range was from 0.48 (West Kent PCT) to 2.5 (Brent Teaching PCT). The mean (\bar{X}) was 1.21 and the standard deviation (σ) was 0.47 with a coefficient of variation (σ/\bar{X}) of 0.39. Analysis of the frequency distribution showed a strong skew (0.63) towards values in the lower part of the range (Appendix 5, fig. 33).

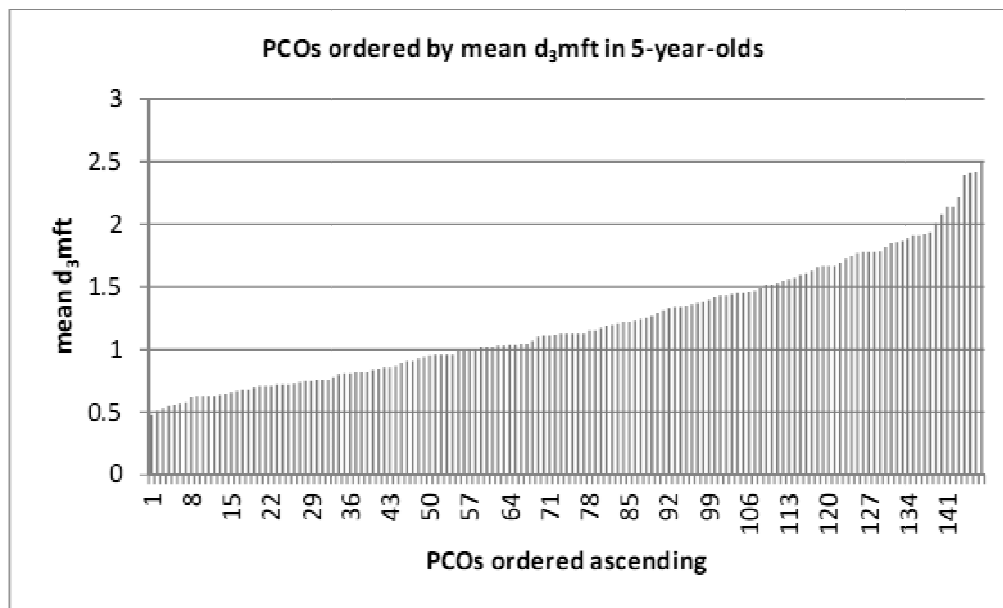


Figure 11. Mean d_3mft scores for 5-year-olds ordered ascending for all PCOs participating in the 2007/2008 DEP survey.

Figure 12 shows the Lorenz curve for mean d_3mft in 5-year-olds. The Gini coefficient was 0.218.

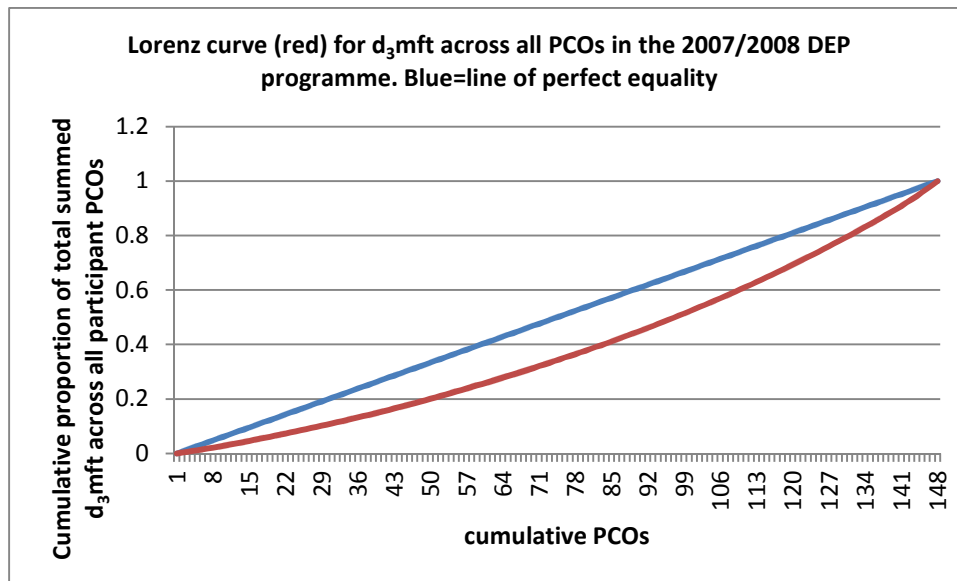


Figure 12. Lorenz curve for mean d₃mft in 5-year-olds across all PCOs participating in the 2007/2008 DEP survey.

9.2.2 Bivariate analysis of secondary data-sets

PCOs were ranked according to both deprivation scores and UDAs commissioned per capita and these rankings were compared. The null hypothesis was that UDAs commissioned per capita ranking are not related to deprivation ranking. The direction of ranking was set to test this null hypothesis. Therefore the PCO with the most per capita UDAs was ranked 1 and the PCO with the most deprivation was ranked 1. The differences in rankings were analysed. The range in the difference of rankings was from zero (Greenwich PCT) to 142 (City and Hackney PCT). The mean (\bar{x}) difference in rankings was 32.1 (median: 24). Standard deviation (σ) was 28.4, producing a coefficient of variation (σ/\bar{x}) of 0.88, indicating the dispersion around the mean. A Spearman's rank-order correlation was carried out with a result of 0.52 found, indicating a positive correlation. The null hypothesis was therefore rejected.

Figure 13 shows IMD (2007) average deprivation rankings plotted against the UDA per capita commissioned rankings presented as an X Y scatter diagram. The extreme positive difference between UDA per capita allocation ranking and deprivation ranking (as above) was City and Hackney PCT with a ranking of 145 for UDA per capita allocation and a ranking of 3 for IMD (2007). The extreme negative difference was Central and Eastern Cheshire PCT with a UDA per capita commissioned ranking of 20 and a deprivation (IMD 2007) ranking of 132. The regression line is displayed. R^2 was 0.27. The p-value (2 sided) was <0.05 . The frequency distribution of the differences in rankings for UDAs commissioned and deprivation score is shown at figure 35 in Appendix 5. The ranking values for each PCO are presented in Appendix 3.

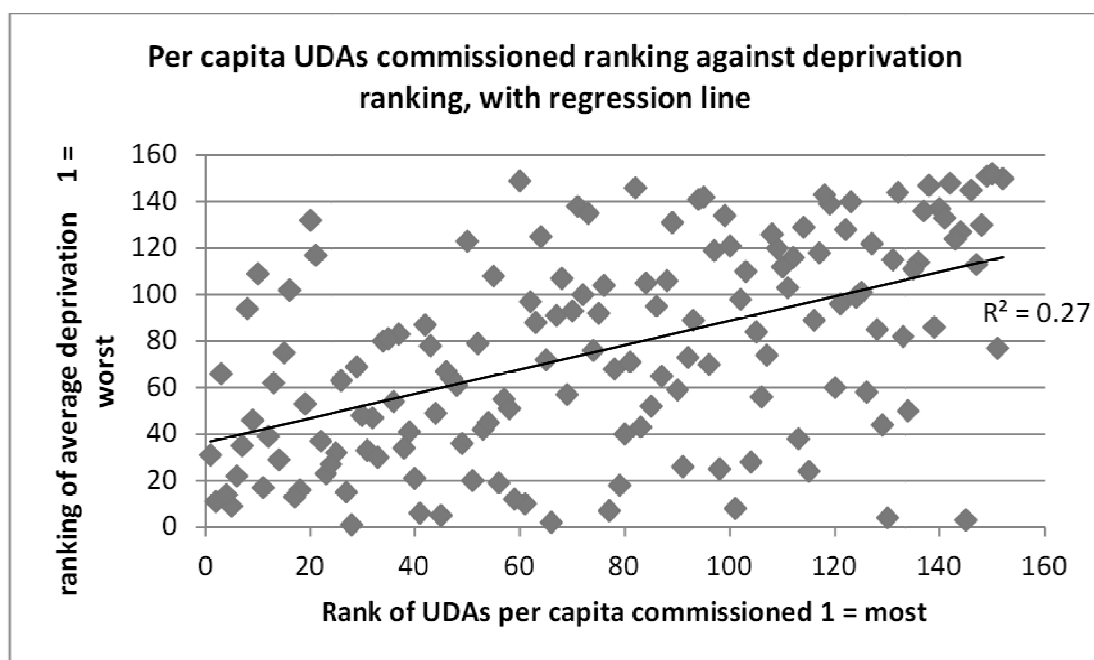


Figure 13. XY scatter diagram of per capita UDAs commissioned ranking, as at March 2009, against average IMD (2007) deprivation ranking for each PCO in England, with regression line.

The next stage was to analyse the actual UDAs commissioned per capita against the actual IMD (2007) deprivation scores for each PCO in England. The null hypothesis was that UDAs commissioned per capita are not related to average IMD (2007) deprivation scores. Figure 14 shows average deprivation score plotted against per capita UDAs commissioned presented as an X Y scatter diagram. The trend-line is displayed, showing R^2 to be 0.22. The p-value (2 sided) was <0.05 . Covariance was 1.369 and Pearson product moment coefficient was 0.47. The null hypothesis was rejected. Most above the regression line was City and Hackney PCT. Most below the regression line was East and North Hertfordshire PCT and Central and Eastern Cheshire PCT.

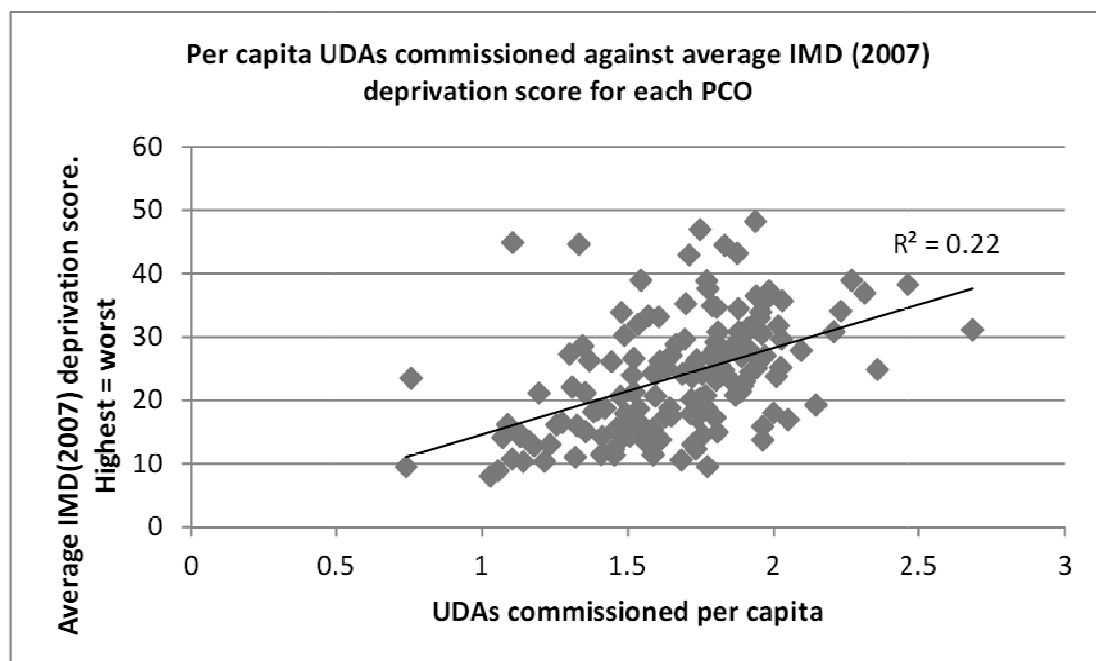


Figure 14. XY scatter diagram of average IMD (2007) deprivation score against UDAs commissioned per capita, as at March 2009, for each PCO in England, with regression line.

Figure 15 shows per capita UDAs commissioned rankings plotted against mean d₃mft for 5-year-olds rankings for each PCO that participated in the DEP study. Ranking for UDAs commissioned was set in reverse order to when this was compared with deprivation, so that

the data were aligned to test the null hypothesis. The null hypothesis was that there is no relationship between mean d₃mft rank and UDAs commissioned per capita rank. The range in the difference of rankings was from zero for Bury PCT, East Riding of Yorkshire PCT and Rotherham PCT to 115 for Great Yarmouth and Waveney PCT. The mean (\bar{x}) difference in rankings was 37.5 (median: 31). Standard deviation (σ) was 30.3, producing a coefficient of variation (σ/\bar{x}) of 0.81.

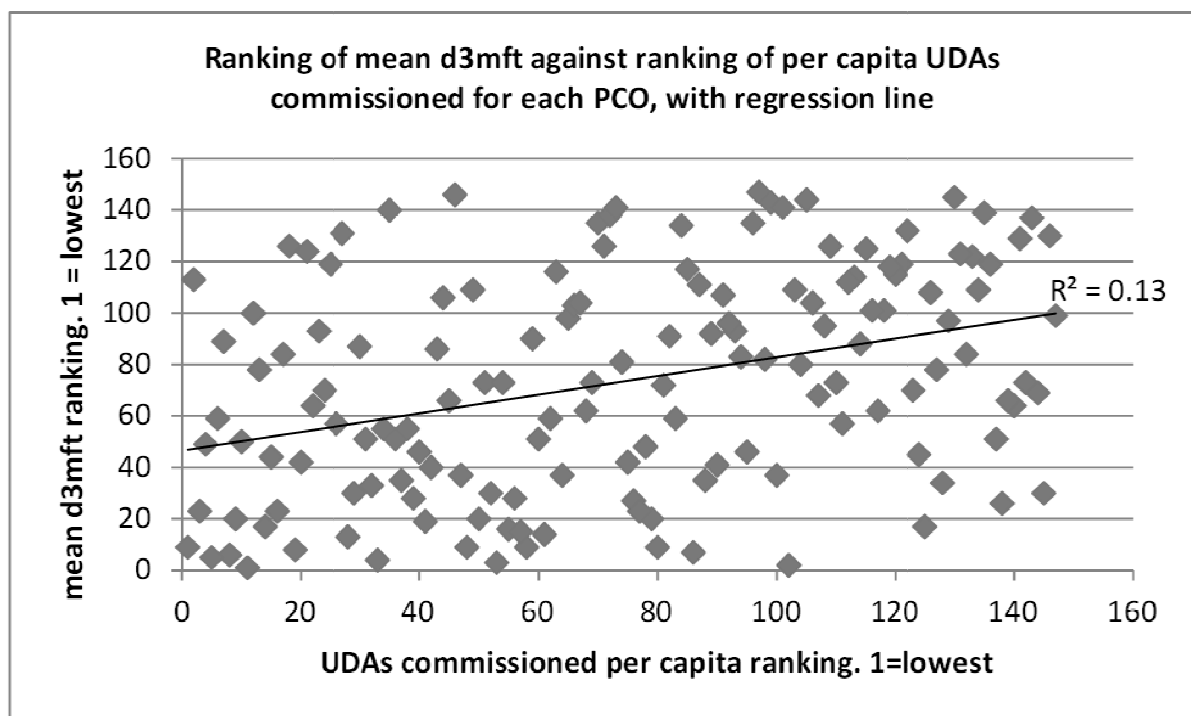


Figure 15. XY scatter diagram of mean d₃mft in 5-year-olds ranking against per capita UDAs commissioned ranking, as at March 2009, for each PCO participating in the 2007/2008 DEP survey, with regression line.

The regression line is displayed. R^2 was 0.13. The p-value (2 sided) was <0.05 . Spearman's rank-order correlation was 0.363. The null hypothesis was rejected. On observing extremes in both directions one extreme was Great Yarmouth and Waveney PCT with a UDA commissioned ranking 115 ranks higher than the d₃mft ranking. The extreme in the other

direction was Kensington and Chelsea PCT with a d₃mft ranking 111 ranks higher than the per capita commissioned UDAs ranking. Most above the regression line was Bradford and Airedale PCT. Most below the regression line was Brighton and Hove PCT. The frequency distribution of the difference in per capita UDAs commissioned rankings and d₃mft rankings is shown at figure 34 in Appendix 5. The ranking values for each PCO are presented in Appendix 4.

Figure 16 shows per capita UDAs commissioned plotted against mean d₃mft in 5-year olds for English PCOs that participated in the DEP survey, presented as an X Y scatter diagram. The null hypothesis was that per capita UDAs commissioned are not related to mean d₃mft. The trend line is displayed. R² value was 0.1. Covariance was 0.047 and the Pearson product moment coefficient was 0.317. The p-value (2-sided) <0.05. The null hypothesis was rejected. The PCTs most under the regression line were Great Yarmouth and Waveney, and Brighton and Hove. Most over the regression line were Bradford and Airedale PCT and Brent PCT.

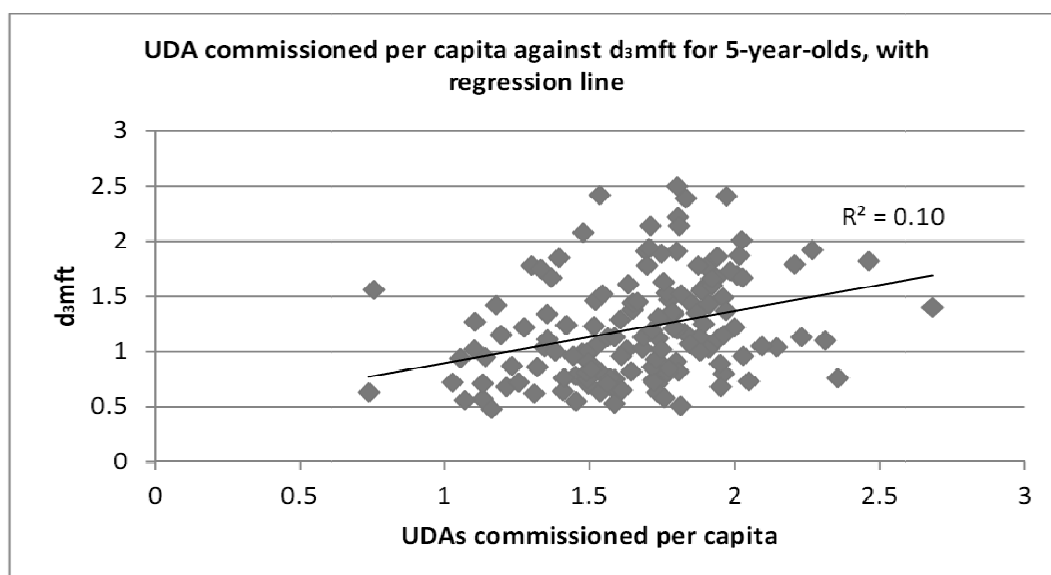


Figure 16. XY scatter diagram for UDAs commissioned per capita, as at March 2009, against mean d₃mft in 5-year-olds for each PCO participating in the 07/08 DEP survey, with regression line.

9.2.3 Summary of findings for studies 1A, 1B and 1C

There were structure and process factors potentially affecting the ability of PCOs to address oral health inequality. These included staffing, hierarchical or political issues, commissioning activity or capacity, and the presence or absence of an OHS. Additional themes included the limited capacity to change public behaviour, and the need to re-design services for some sections of the community.

The variation in the presence of strategies aimed at addressing oral health inequality was unexplained. At this point the researcher engaged with the NHS emphasis on innovation and decided that exploration of the role of innovation in PCO strategy to address oral health inequality could produce new knowledge. The researcher also decided that a wider consideration of strategy could assist in developing new knowledge. In particular, this was supported by the concept of “*emergent strategy*”, as described by Mintzberg (1978) (280). It was therefore decided to conduct a second study (study 2) in order to focus on both strategy and innovation in relation to addressing oral health inequality.

CHAPTER 10: STUDY 2 – EXPLORING THE VIEWS OF CONSULTANTS IN DENTAL PUBLIC HEALTH ON STRATEGY AND INNOVATION TO ADDRESS ORAL HEALTH INEQUALITY

10.1 Methodology

10.1.1 Sampling

The sampling was purposive with heterogeneity sought in terms of practicing demographic variation, rurality, gender and experience. The sampling was also iterative in that not all participants were decided upon at the outset and later participants were included owing to perceived heterogeneity from the earlier participants. Sampling ceased when it was believed saturation had been achieved, despite having attempted to maximize participant diversity.

10.1.2 Topic guide

The topic guide, included at Appendix 7, was informed by the literature review and the research in this thesis conducted up to this point. It was developed in order to obtain relevant information in the areas of strategy and innovation. Definitional issues around the terms innovation and strategy were also addressed. Greenhalgh's call for a greater focus on

innovation failure or non-occurrence and also on inter- organization knowledge transfer, amongst other organizational factors, were also taken into account(303). The topic guide was trialed at a one-to-one interview, where it was found to be suitable. This initial interview formed part of the total sample, and information obtained was included in the study in the same way as subsequent interviews. It was accepted that the topic guide could be refined as the study progressed; this was not found to be necessary. The face-to-face interviews were semi-structured in that diversions from the topic guide into areas that might produce relevant data were permitted.

10.1.3 Participation

All participants that were invited to participate did so. Seven face-to-face interviews were conducted with CsDPH at their places of work between January and August 2011. The interviews were approximately forty-five minutes in length. Interviews were recorded on a voice recorder after explanation of the reasons for this and consent being obtained.

10.1.4 Analysis

The recordings were transcribed verbatim and the transcripts were imported into NVivo8, a qualitative research software tool from QSR International (430). Data were analysed by the researcher using a framework approach (400). A preliminary framework based on the research objectives was expanded as new themes emerged. Analysis of each transcript before the next interview was conducted allowed subsequent sampling to be iterative, addressing the implications of emerged categories as well as divergent aspects of the participants themselves. This was not uniformly the case as some participants were contacted

simultaneously with other participants. Once codes were developed they were grouped into categories. It was necessary to redact some elements of the transcripts where there was a potential risk of participant identification. These included places of work or references to named individuals.

10.1.5 Second researcher

Transcripts and analysis were validated by a second researcher. The second researcher, a dental academic, was of a different background to the author.

10.2 Results

The themes that developed from the face-to-face interviews were:

- Factors pertaining to the individual consultant.
- Organisational factors at the PCO level.
- Factors specific to the innovation itself.
- The implications of organisational change.
- Organisational factors at the macro level.
- Quality concerns about the evidence-base.

10.2.1 Factors pertaining to the individual consultant

Strategy

There was variable interpretation of the word strategy. The word strategy was viewed as “...the plan...”^{CDPH7} or “...feels like a future plan in some way”.^{CDPH5} Strategy was also viewed as something that needed to be “...constantly refreshed.”^{CDPH1} and was “...just a rolling piece of paper.”^{CDPH7} The derivation of strategy from policy was mentioned by one participant: “My point of view a strategy follows on really from policies.”^{CDPH7}

Consultants varied in the degree to which they were prepared to closely follow national guidance on strategies. The following participant suggested that there might be little point in local expertise if all that was required was to follow national guidance:

“Because actually I pay no attention to anything...what would be the point of me if I were to do anything different? There wouldn’t be any point. So no I don’t feel constrained....”^{CDPH6}

However, the following contribution shows that there was perceived security in following national guidance:

“... let’s do what it says on the tin because if that’s what it says on the tin then nobody’s going to complain.”^{CDPH7}

Innovation

The following three contributions show how the word innovation may have different meanings for different consultants. It may be synonymous with invention, it may be the taking of ideas from elsewhere, or it may encompass both concepts:

“Innovation to me I, it comes to mind that of things that really haven’t been done before by anyone.” CDPH1

“... it’s borrowing ideas....” CDPH6

“Not just new as in that’s never ever been done before, but new as in we, in this area perhaps have never done it before.” CDPH7

There was individual awareness of, and preparedness to adopt, innovations from elsewhere. The second contribution also shows how innovation may have been derived from beyond the field of dentistry, perhaps by informal means.

“...I work with other dental public health people and other people and I’m also really keen to take what they’ve done and try and make it work for us here too.” CDPH5

“And in fact I’ve probably picked up most of my ideas from conversations and not necessarily dental ones.” CDPH6

A participant indicated that awareness of innovations to potentially adopt arose through

“...networking and almost casual conversations.” CDPH3 Adoption appeared to be facilitated by close communication with an individual holding knowledge about the innovation:

“...one of my colleagues was part of the working group and we shared an office together so we’re constantly discussing....” CDPH4

The following contribution illustrates how knowledge gained informally might not otherwise have been available:

“And if it wasn’t that I bumped into...I wouldn’t know what they were doing, thinking - do you know that’s a darned good idea! And if I didn’t bump in into [PCT] and they talk about their website, and I think do you know that’s better than what we’ve got here. So, but I don’t think that any of those people actually send us the information.” CDPH5

Leadership qualities played a role at innovation implementation and post-implementation:

“Lots of motivation and support and, you know, working with people and , you know, leading by working with people and trying to encourage them to move on and trying removing all the barriers... it is absolute positivity the whole time. If you don’t remain positive, then people won’t do it.” CDPH5

“But, it’s my job to lead the process, champion it, and be an advocate for it once it’s done.”

CDPH6

10.2.2 Organisational factors at the PCO level

Strategy

The following two contributions suggest that there may be a disparity between PCO time-frames and time-frames that might be more appropriate for some projects relating to dental public health:

“... when you write an oral health strategy for a PCT it has to be on the PCTs timings.

However, when you work in dental public health you’re always aware of the wider direction you might want to take things.” CDPH2

“Then they say well you need to evaluate it and you say yeah but most things in terms of health promotion take years and years and years before you see any changes.” CDPH7

Participants indicated that OHSs may sometimes be undeliverable owing to inadequate human resource, and there may have been a need to prioritise contemporaneous difficulties:

“... it’s just having the capacity to do it which could be quite challenging as people disappear.” CDPH6

“... and then we’re still losing people, we haven’t got the men on the ground to develop anything. You know, we are fire-fighting at the moment....can the PCT deliver on the strategy, or even develop it? When you’re fire-fighting it’s really difficult to look ahead.”

CDPH5

The following contribution suggests that a PCO may have had shortfalls in their ability to convert data into usable information, with this being nobody’s role:

“But nobody will take the time to get it. Because nobody’s directed to do it...And unless we’re prepared to go in and do it ourselves physically there are very few people out there who are prepared to do it.” ^{CDPH7}

OHSs may have suffered from “...too little use...”^{CDPH1} and some may have been generic, with perceived questionable utility:

“...everybody’s strategy in every PCT looks exactly the same as the next one. So, what’s the point?” ^{CDPH7}

A disparity between what a PCO board sometimes wanted and what a PCO board sometimes decided upon is indicated by the first contribution. The second contribution suggests that the conflict between financial concerns and dental public health improvement was “*the biggest problem*”:

“ ... sometimes what they [the Board] want and what they decide on don’t always meet in the middle.” ^{CDPH5}

“...how they vote with their financial feet is different to what they would say in terms of: Yes we want to improve dental access. And that’s a problem. That’s the biggest problem actually.” ^{CDPH5}

A consultant indicated that OHS development was “...very often seen as the end in itself.”

^{CDPH1} Another consultant described the process as “*absolutely conflictual.*” ^{CDPH5} The following contribution shows how there would have been perceived dangers to strategy development without stakeholder engagement:

“So, if I were to write a strategy and I haven’t engaged with those sorts of people I would have absolutely no chance of getting it done because nobody else had been engaged.” ^{CDPH6}

However, this contribution illustrates how dental public health may not always have been engaged as a stakeholder in the wider PCO public health agenda:

“We’re not necessarily included in meetings....the public health team might meet every month, but we’re not asked.” ^{CDPH7}

Two participants appeared to have a flexible “*implementation plan*” that stood separate from a relatively fixed OHS:

“... there needs to be an implementation plan. That needs to change as time goes on. But in terms of the oral health strategy itself no....” ^{CDPH6}

“Now the overall guiding vision will be the same but the sort of implementation plan of it will change along the way.” ^{CDPH5}

Innovation

Appreciation of oral health issues at PCO board level facilitated implementation:

“It is something with which now they [the Board] are familiar and recognise throughout the organisation as being one of the range of things they need to address as a priority alongside everything else rather than a afterthought which is how sometimes it was regarded.” CDPH1

A participant indicated that adoption may be restricted because individuals with relevant skill sets “...can be quite thin on the ground.” CDPH1 Regarding adopting innovation, a participant said that time considerations meant that there was not “...that luxury....” CDPH7

Solving pressing current problems may hamper innovation:

“...I have five hundred emails a week, actually, and you’re fire-fighting, it’s again very difficult to think ooh we could do that differently. ...” CDPH1

Adoption may be moderated by the capacity for creative thinking in the PCO:

“So if you haven’t got people that can think creatively and think innovatively about...how they can use what somebody else has done and tweak it and make it theirs, it’s very difficult.” CDPH5

The following participant perceived that organisational climate could be a variable in being able to think innovatively:

“I think there’s something very much about the environment in which you work. So that if you’re working...and...it’s really dull around you, and everybody’s got their head down and you never get chance to, you know, lift your head up and smell the roses. Then actually, again, it’s really very difficult.” ^{CDPH5}

A consultant ^{CDPH1} indicated that decision-makers in the innovation process should get support from individuals with previous experience of the innovation. The following participant indicated that the importance of support extended to the post-implementation stage, as illustrated by:

“...you’ve got to have people looking at it from day one... you’ve got to know if it works, their teething problems you have people going into the practices or going into the services....” ^{CDPH4}

Although an innovation was not implemented because the consultant ^{CDPH6} could not obtain funding, another consultant ^{CDPH1} found implementation to be more successful than anticipated. However, implementation may not occur where there are competing priorities:

“And they’re not going to put it through because... secondary care is beating and screaming at the doors for money.” ^{CDPH7}

The following contributions illustrate how implemented innovations could become threatened by withdrawal or reallocation of funding. The second contribution illustrates how this could still occur with innovation that appeared to be successful:

“...and you hope it’s protected for three years...third year funding, we hope will be there.

There is a hope.” CDPH4

“...and whilst it works...the funding ceased and you couldn’t identify other funding to make it carry on.” CDPH1

The following contribution illustrated how funding for an implemented innovation could be lost due to competition developing over such funding:

“It’s probably not gonna become an issue unless the money that is used to fund the service is targeted by someone else. And they want that money and start tightening things up. If they do, then, you know, there’s tremendous potential for it being scuppered.” CDPH3

However, lack of motivation could cause an innovation to flounder even though funding was available, as illustrated by:

“...the funding was identified but the drive wasn’t there to deliver. So there was a lot of dragging of feet until the funding was lost.” CDPH4

Support may cease before sufficient time has elapsed for appropriate evaluation, as illustrated by:

“...it takes a long time to see any changes occurring in dentistry....So that work finished before we could, from my point of view, see the dental changes.” ^{CDPH2}

The following contributions show how there may be no impetus for innovation where problems are already solved. Consideration of innovation may sometimes require a problem to arise first. The second contribution illustrates a perceived ability of “*tried and tested*” methods to sometimes deliver “*quick wins*”, which may work against innovation:

“... because we’re doing the things we need to do and they’re working, to achieve those results we haven’t had to look to innovation to solve any of those problems. I think innovation tends to come in when things aren’t working, aren’t producing the results.”

CDPH2

“... sometimes you need a quick win, organisations looking for quick wins. And if... they want quick wins innovation isn’t always the answer and so they sometimes go back to tried and tested ways.” ^{CDPH3}

A participant ^{CDPH2} suggested that PCOs possibly had heightened risk aversion “*at the moment*” associated with NHS financial constraint. Nonetheless, the following contribution demonstrates a perception that attitude towards risk may have varied across PCOs:

“... this PCT takes risks, I would have to say. I’ve worked for other PCTs that will not, you know, under any circumstances.” ^{CDPH5}

The following participant suspected that contextual “*pressures*” on a PCO may drive innovation:

“...if you look at some other primary care organisations that have been rapid adopters...I would suspect that the reason behind that is that they’re the pressures they faced....” CDPH1

Likely political impression was considered when adopting an innovation, as illustrated by the following contribution:

“It was politically acceptable. And I think you could make the argument that [a dental public health intervention] is less politically acceptable, certainly here.” CDPH3

10.2.3 Factors specific to the innovation

Adoption was facilitated where the innovation was consistent with the PCO’s strategy or priorities. However, the same “*idea*” could be welcomed differentially over time:

“...an idea does seem to have its moment and if it doesn’t have its moment you can’t get it in.” CDPH6

The following contributions illustrate how PCOs may have adapted innovations to local circumstances after adopting them:

“In fact we found that phenomenally expensive so we tweaked it and changed it.” CDPH3

“... and put together a service design that more suited what we’re doing locally.” CDPH4

“Now, we did it very very differently here. We had a different kind of contract, we had a different kind of provider.” CDPH5

10.2.4 The implications of organisational change

Strategy

In the context of NHS re-organisation, there was uncertainty regarding how strategies could be merged as organisations were brought together:

“...and the big question which is being asked by all the stakeholders is that what happens next? Because you’ve got [number] strategies, different strategies, different priorities, different target groups and you will end up with one organization.” CDPH4

The following contribution refers to a possible *“implementation plan”* (also referred to in contributions at 10.2.2 above) as well as a strategy. It was perceived that organisational instability meant that an *“implementation plan”* could not be written although it was perceived that this instability meant that a strategy was more important than previously:

“It’s not stable enough to write an implementation plan at the moment. But I think we probably need a strategy now more than ever before.” ^{CDPH6}

The following contribution illustrates how organisational change could moderate acceptability of ideas for inclusion in strategy:

“...and if somebody tells me to shut up I know they’ll go eventually and I just have to wait until they’ve gone away then I shall be able to get up again and tell somebody else.” ^{CDPH6}

Innovation

It was perceived that the NHS re-organisation could break up teams and that developing new teams could be difficult. The following contribution shows how individual priorities could militate against innovation in the context of change:

“So when you go with any innovative ideas they’ll say what are you talking about? You know. My problem is my survival.” ^{CDPH4}

A participant ^{CDPH5} voiced uncertainty regarding the possible effect of greater local-level political involvement in public health decision-making. The following contribution illustrates a possible variable effect of political influence according to the stage of innovation development, with later engagement having the potential to be “*disruptive*”:

“...a political influence coming in at an early stage, which if you work with it can be very positive but can also be disruptive if it comes in half way through.” CDPH3

The following contribution suggests a perception that inconsistency between an innovation and political ideology could threaten the innovation’s future:

“I wouldn’t be at all surprised if the [dental public health intervention] one fell foul of the political dimension and it doesn’t really fit with the nudge agenda. It’s a bit too intervening for the current administration.” CDPH3

It might not have been possible to implement some “*ideas*” during the NHS re-organisation, as illustrated by the following contribution:

“There’s lots of ideas I have at present and it may be that I can’t do them, because I don’t know what’s happening with the National Commissioning Board and the clusters and I need essentially commissioning support to do them.” CDPH2

However, the following contributions, both from the same participant, suggest a perception that it might sometimes be easier to adopt in the context of change than in one of relative stability:

“Well in some ways sometimes when things are changing, even when they’re changing for the worse, it’s easier to get innovation in.” CDPH6

“So when things are in complete and utter chaos...committees aren’t quite as settled as they were or, you know, sometimes individuals who were getting in the way go and leave....”

CDPH6

10.2.5 Organisational factors at the macro level

Strategy

Participants felt that they had sufficient freedom to take into account local context in their strategies. However, the following contributions show an influence of central requirements on strategy:

“There are elements of constraint within the commissioning section because of the top down requirements for commissioning UDAs basically, which might at times push us in a slightly different direction to what we’d do if left completely alone.” CDPH3

“PCTs have to do what the Department of Health tell them. So, in our strategy we have to show how we’re meeting anything specified to us in any of the guidance that’s been issued by the Department of Health.” CDPH2

Innovation

A procedure had been implemented in one location but, much later, a presentation was given at the Department of Health. The participant indicated that, despite Department of Health

awareness of the initial implementation, there had been no communication with the participant in order to disseminate at that time:

“... but I thought, well I’ve been doing that for 18 months...and the Department knew about it, but nobody had said, you know, do you want to come and give a presentation on it...?”

CDPH5

The following contributions suggest that absence of a “*forum*” related to innovations was lamented and that a “*bank of ideas*” would be considered helpful:

“...but it’s a shame there isn’t more of a forum for, you know, just this is what we did, this is how it worked. Just, you know, not having to be wonderfully written like a beautiful article for the BDJ. But just sort of a dump of how things are. Because, I don’t think we do do that.”

CDPH5

“... having a bank of ideas somewhere and a list of where, you know, how that had been tested would be a good thing. It would help me.” CDPH6

Participants indicated that PCOs used various routes for dissemination including via a conference, e-mail, “*workshops*”^{CDPH3} and a “*paper*”^{CDPH4} However, it was perceived that possibilities for sharing information on how something was done may be limited, and be “*not easy*” to get published, as illustrated by:

“There isn’t a lot of sharing about just this is how we did something. You know, because it’s not evidence based. It’s, this is how we did it. And these are the lessons that we learned. It’s not easy to get anything like that published.” ^{CDPH5}

Some PCOs may have not disseminated because “...there’s no real value.” ^{CDPH5}

Nonetheless, participants indicated that Primary Care Commissioning (PCC), an SHA, and the BASCD had performed dissemination roles. However, dissemination to other PCOs might sometimes occur only through talking with other consultants:

.

“The only channel we might have is if we talk to other dental public health consultant colleagues. And they then might pick it up and suggest to their PCTs. But, no, you wouldn’t communicate anything at all.” ^{CDPH7}

Although a participant suggested that knowledge boundaries may have been permeable and “things tend to leak out” ^{CDPH1}, receiving disseminated information from another “region” was perceived to be more difficult than from within the “region”, as illustrated by the following contribution:

“...it’s passed between PCTs, at least in [area]. It’s harder, I think, for information to pass out from other regions in the country...into our region.” ^{CDPH2}

Information sharing could reduce in future because of a greater focus on the value of intellectual property:

“And actually that intellectual property that we share very openly...that will not be the same if I work for Virgin Healthcare... or if I set up my own chambers to offer services I’ll be charging for that thank you very much and I’m not gonna share it. So, I think that is a real risk looking to the future.” ^{CDPH5}

10.2.6 Quality concerns regarding the evidence base

Evidence of previous success was a factor in deciding whether to adopt. The importance of prior evaluation was emphasised in that PCOs “...can’t just do things....” ^{CDPH2} There was unease regarding implementations destined to fail:

“So why do we allow, when we commission salaried services and groups and health promoters, to waste time, energy and money doing something which we know will never work.” ^{CDPH7}

Evidence bases supporting potential innovations could be inadequate. The following contributions show how information provided about an innovation could be unreliable:

“...and sometimes when you phone those people up it wasn’t quite like that at all.” ^{CDPH6}

“...people might crow about their successes and that can sometimes give rather a warped view....” ^{CDPH1}

10.2.7 Summary of findings

Delivering on a strategy or adopting and implementing innovation could be hindered or facilitated by several factors. Such factors could relate to the organisation locally or centrally or could relate to aspects of the innovation itself. In addition, factors relating to the individual consultant could be distinguished, including variable conceptions of the terms strategy and innovation. Impending organisational change was perceived by participants to affect strategy and innovation, but this effect was not universally considered to be negative. Dissemination of PCO-level innovation may be sub-optimal and may be partly subject to local or regional bounding. There was a perception that there was no facility for CsDPH to conveniently submit or obtain information relating to innovation at a national level.

It was decided that a wider range of CDPH attitudes towards strategy and innovation aimed at addressing oral health inequality should be sought, including to explore more widely emerged themes from study 2, such as variable conceptions of strategy and innovation, and limitations to dissemination. Study 3 was carried out to meet these objectives.

CHAPTER 11: STUDY 3 – OBTAINING THE ATTITUDES OF CONSULTANTS IN DENTAL PUBLIC HEALTH ON STRATEGY AND INNOVATION TO ADDRESS ORAL HEALTH INEQUALITY

11.1 Methodology

11.1.1 Development

A questionnaire was developed and distributed in February 2012 as a pilot to seven CsDPH known to be engaged with a PCO, based on the findings from studies 1 and 2, and on areas possibly comprising relevant new knowledge, including relating to NHS re-organisation. The initial pilot, complying with aspects of questionnaire methodology (449), was reported to be arduous and was discarded to avoid a strong negative effect on responses. Difficulties were caused by random listing of statements instead of subject area groupings, and by each statement having an opposing statement. A new pilot was conducted in February 2012 with the same consultants. This met with greater satisfaction and was considered suitable to adopt as the definitive questionnaire. The data from the second pilot questionnaire are included in the overall data and the seven consultants involved in the second pilot are included in the overall sample size. One of these seven had not replied by the time it was necessary to decide to distribute the definitive questionnaire. Therefore, the second pilot comprised six

consultants and the response from the seventh consultant, when received, was considered as part of the overall data. It was noted by one pilot participant that one of the intended statements was in fact a question. It was felt that the goodwill of pilot participants might be nearly exhausted, so a third pilot was not proposed. This question therefore remained as responses to it could still be informative.

The questionnaire comprised forty-three statements with the range of available responses being a Likert-type scale (449) from strongly agree, agree, uncertain, disagree and strongly disagree. The questionnaire had a free text section for the participant to add any comments. The questionnaire allowed participants to state their SHA area (as it would have been prior to the clustering of PCOs), and the number of years that they had been a CDPH, within the ranges 0-5, 5-10, 10-15, 15-20, and 20 years or over

11.1.2 Sample

The definitive questionnaire was distributed in March 2012. The deadline for responses to the third, final, mailing was May 31st 2012, prior to publications in June 2012 describing the new NHS commissioning structure and, in limited detail, new arrangements for commissioning dentistry (111,271).

The desired sample was to be contactable CsDPH engaged with a PCO in England.

A list of CsDPH was obtained from the most up-to-date available (January 2012) Directory of Consultants and Specialist Registrars, published by the BASCD (450). Addresses outside England were excluded, as were individuals not a CDPH. One consultant known not to be in a post was excluded, as was one known to be retired. Three consultants with no address were

excluded. One known to be unconnected with a PCO was also excluded. Once these were removed the sample size was 67 (including seven pilots).

Responses permitted exclusion of those declaring themselves to be purely academic, retired, or unconnected to a PCO. Further informally gained knowledge indicated that additional non-responding individuals should be excluded because they were known to be retired or purely academic. This number, from both means, amounted to 23. An individual in the original sample, who had not responded anyway, was found not to be a CDPH and was excluded, taking exclusions to 24. The sample size of contactable CsDPH either engaged with a PCO, or for whom this could not be disproved, was therefore 43.

11.2 Analysis

Likert-type scaling rather than Likert scaling was used to avoid the difficulty of response categories having no objective numerical basis (415). The Likert-type scale responses were considered ordinal, with no fixed interval between response alternatives (415). Statistical analyses that would have been applicable to interval variables (rather than an ordinal one) were therefore not applied in this thesis (451). The number of responses for each response option for every statement was calculated, along with the numbers pertaining to different SHA areas and bracketed years of experience.

11.3 Results

11.3.1 Overall results

The first, second and third mailings were followed by 13, 9 and 5 returns respectively. One return received after the third mailing was originally intended as a pilot. Six out of seven second-wave pilot questionnaires had been returned. With 33 completed questionnaires, the overall response rate was 76.7%. The response rate of the second-wave pilot was 86%. The response rate excluding the second-wave pilot (and the delayed second-wave pilot response) was 72%. A table showing the distribution of responses to the statements in the questionnaire is at Appendix 12.

In the rest of this sub-section, where ratios are displayed, the numerator is the number of participants who responded as described, and the denominator is the number of participants that replied to that statement. Where a single number appears in parenthesis, this refers to the statement number on the questionnaire.

11.3.2 Strategy

Figure 17 shows that most CsDPH (24/32) disagreed that they had enough people and money to deliver their OHS (35).

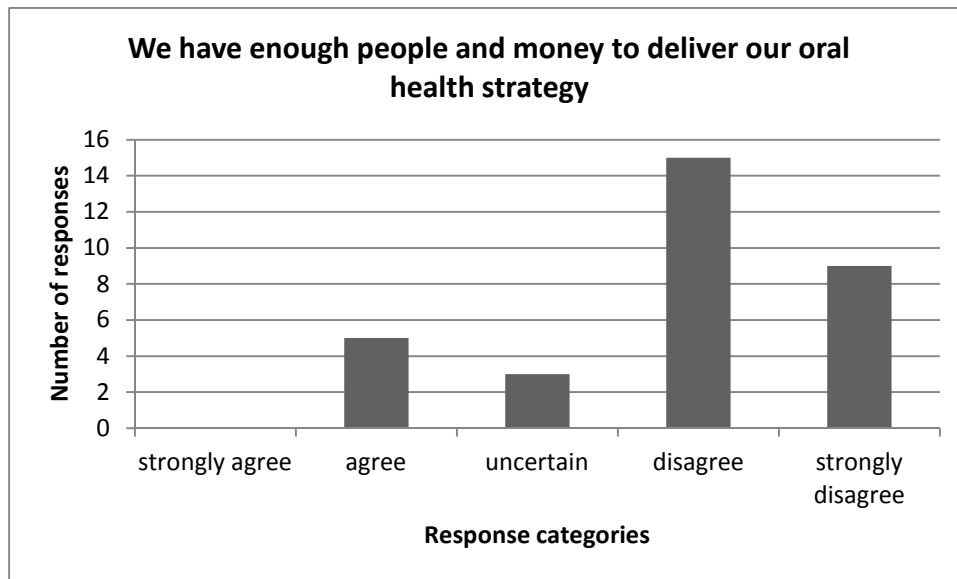


Figure 17. Distribution of questionnaire responses to statement 35

Figure 18 shows that just over half of CsDPH (18/33) responded that their written oral health strategies generally remained useful over their intended durations (37), although eight disagreed, and that most (23/32) responded that adapting to change made actual strategy different to that which is in written documents (38). Figure 18 also shows variation in responses as to whether PCO commissioning decisions sometimes took no account of an OHS (36), with nineteen agreeing, eleven disagreeing, and three uncertain.

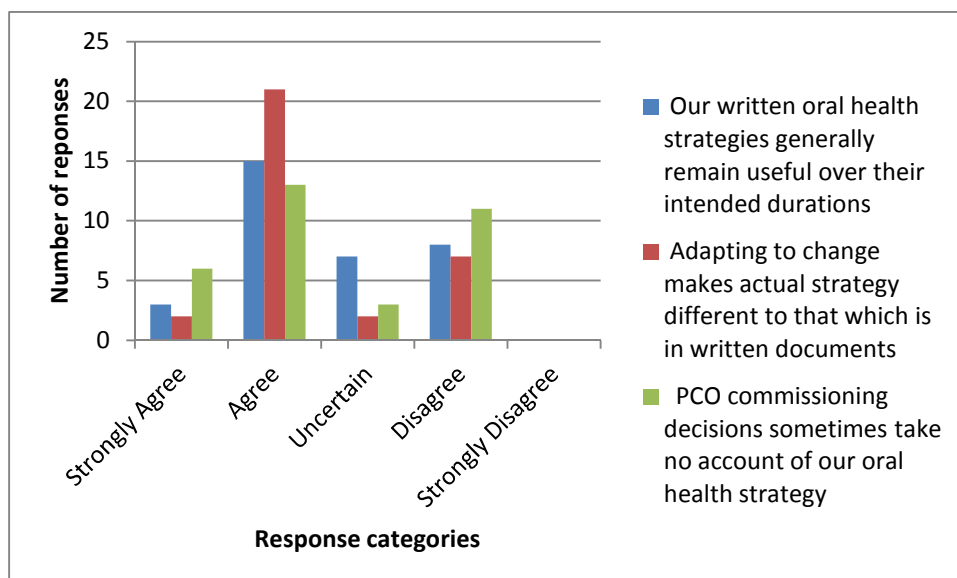


Figure 18. Distribution of questionnaire responses to statements 36, 37 and 38.

Figure 19 illustrates that two thirds of respondents (22/33) did not agree that their OHS had been distorted away from the needs of their population in order to accommodate national requirements (41).

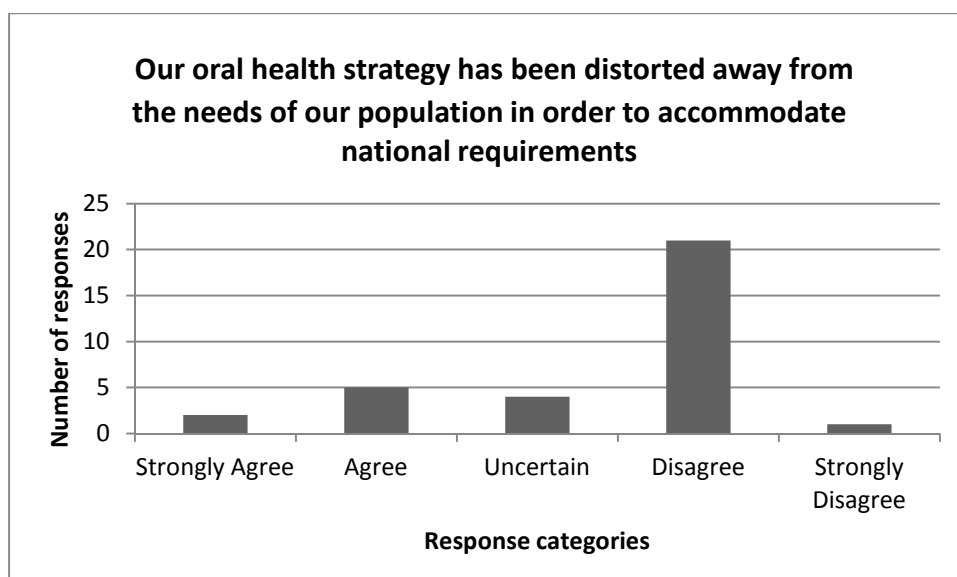


Figure 19. Distribution of questionnaire responses to statement 41

Under half (13/32) responded that they did not have the resources in their PCO to convert raw health data to useful information, with more than half (18/32) disagreeing with this (42). Figure 20 shows varying responses as to whether an OHS was integrated with other PCO strategies, with fourteen agreeing, eight disagreeing, and eight uncertain (43).

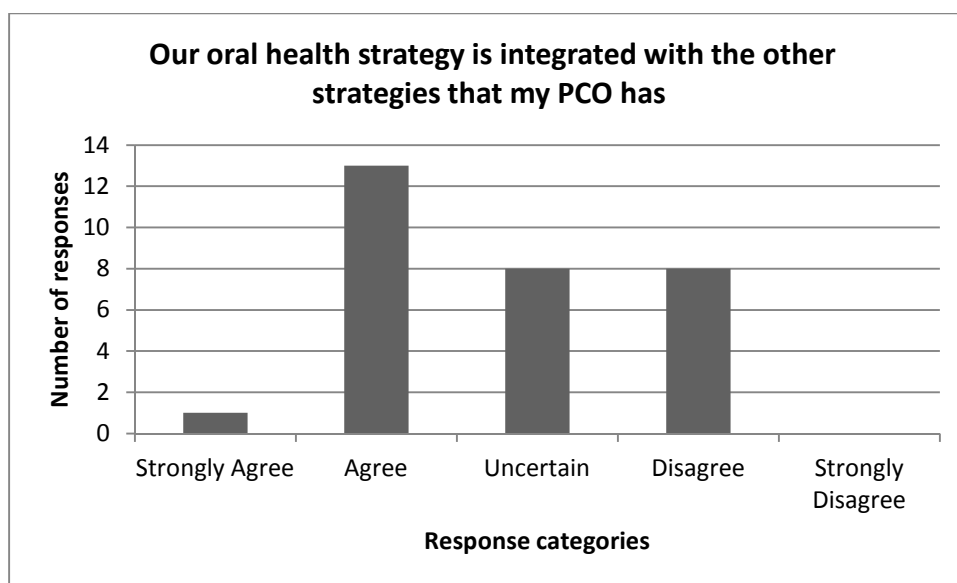


Figure 20. Distribution of questionnaire responses to statement 43

11.3.3 Innovation

Figure 21 shows a tendency (22/31) to disagree that something only qualified as an innovation if it had never been done anywhere else before (19). Over half (20/31) responded that something new to an organisation can be called an innovation, even if it has been used previously elsewhere (20). Over half (21/30) responded that innovation covered both those

things that are new to the organisation, even if used previously elsewhere and those things never done anywhere else before (21).

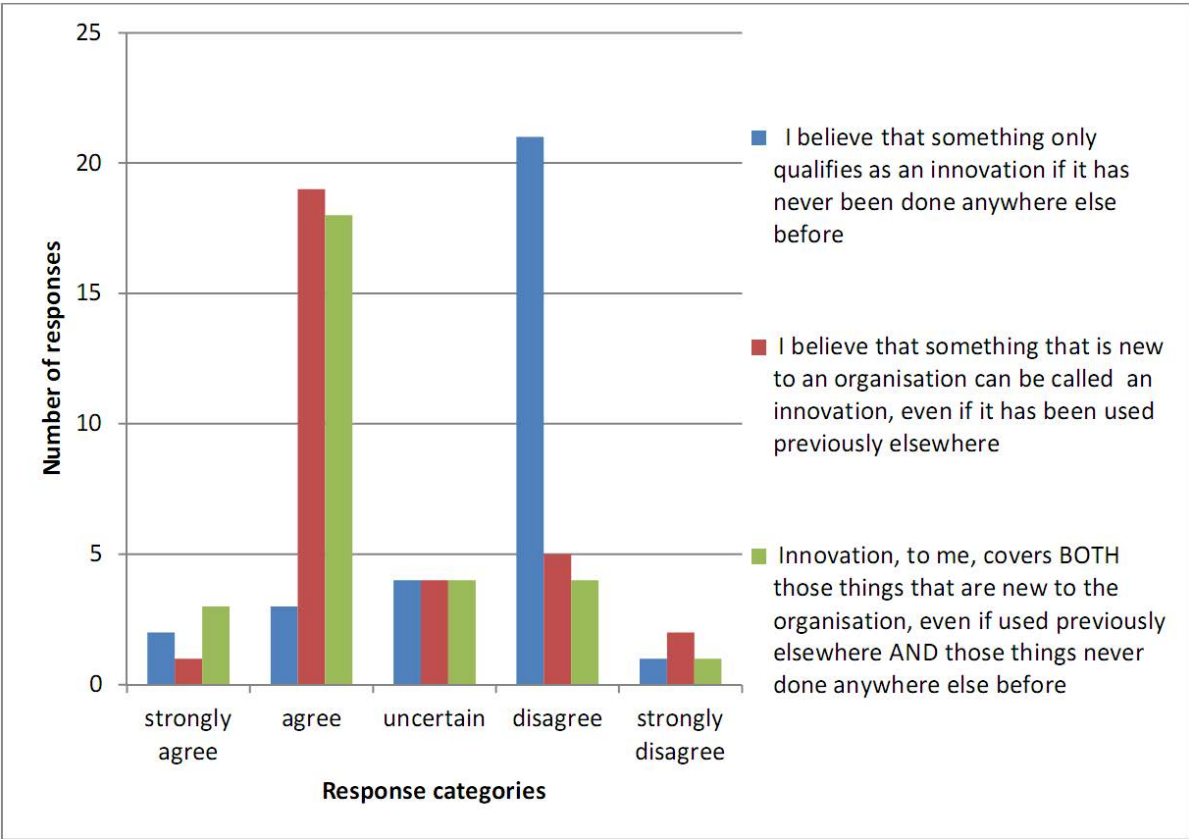


Figure 21. Distribution of questionnaire responses to statements 19, 20 and 21.

Figure 22 shows that a large majority (30/33) responded that their PCO encouraged innovation (3), and most (26/33) perceived their PCO to be always looking for new ways to reduce inequalities in oral health (1).

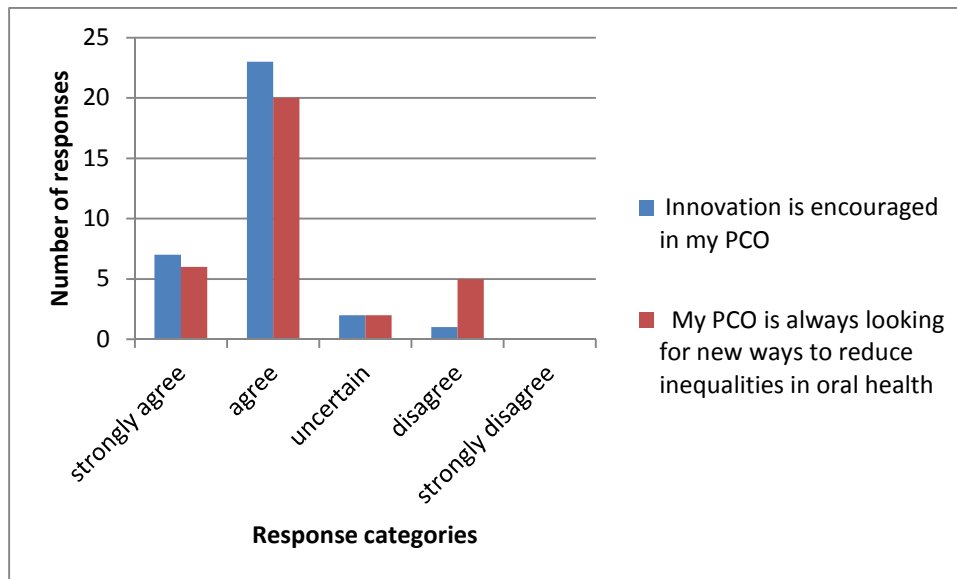


Figure 22. Distribution of questionnaire responses to statements 1 and 3.

Almost all (31/33) responded that their PCO allowed some freedom for individuals to implement innovation to solve problems (2). Most (24/33) responded that new ideas could come from anywhere in their PCO and be equally well received (5), and also (25/32) that their ability to come up with original ideas and ways of doing things was respected by those “at the top” (6). Figure 23 shows that most (23/31) did not believe that their PCO was too risk averse regarding potential dental public health initiatives (4), but also shows varying responses (14/32 agreeing and 18/32 disagreeing or uncertain) as to whether they would be supported by their PCO if a risk was taken with an initiative that has been approved by the PCO, but failure resulted (25).

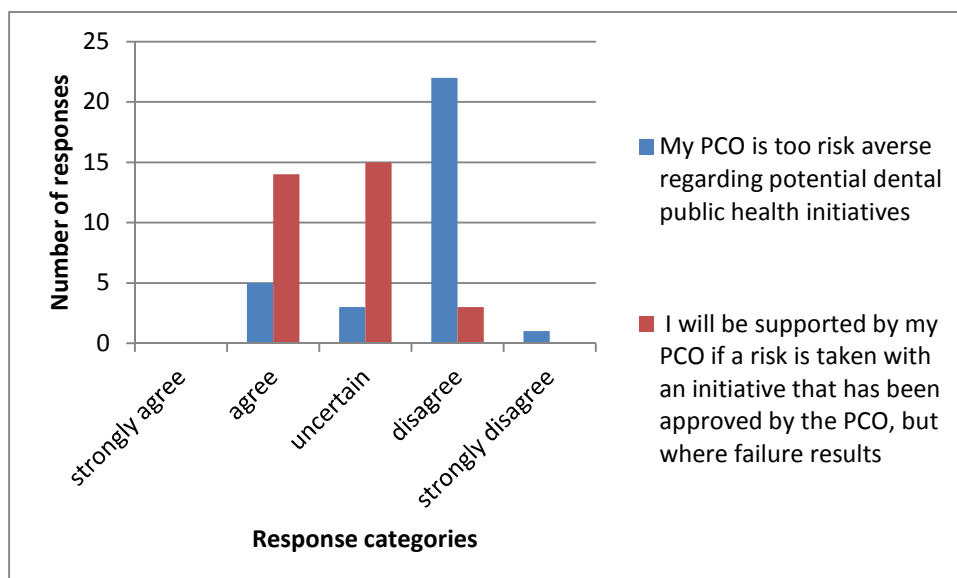


Figure 23. Distribution of questionnaire responses to statements 4 and 25.

Figure 24 shows that most (24/32) did not respond that there was a national source that they could go to where knowledge gained from dental public health initiatives in other PCOs was available (8).

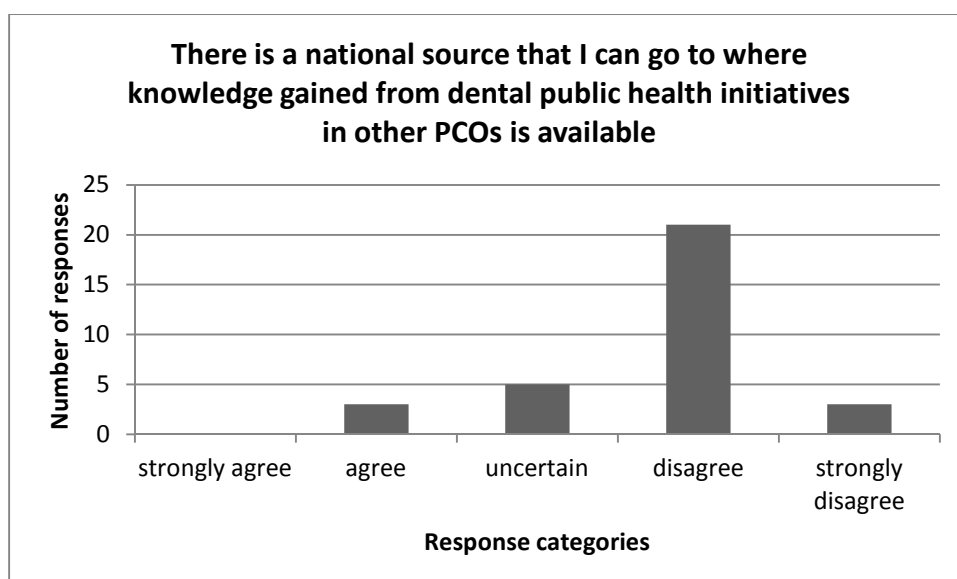


Figure 24. Distribution of questionnaire responses to statement 8.

Responses varied as to whether there was no suitable “place” to publish findings from their dental public health projects (9), with seventeen participants disagreeing, eight agreeing, and six uncertain. Responses varied as to whether available information about dental public health initiatives from other PCOs was generally sufficiently evidence-based (10), with ten disagreeing, six agreeing and fourteen uncertain. Figure 25 shows that most participants (26/30) responded that they did not generally write up findings from their dental public health initiatives in a way that contributed to the evidence-base (23), and that responses varied more in relation to whether their PCO saw no benefit in formally writing up findings from new dental public health initiatives (31), with sixteen disagreeing, eleven uncertain and six agreeing.

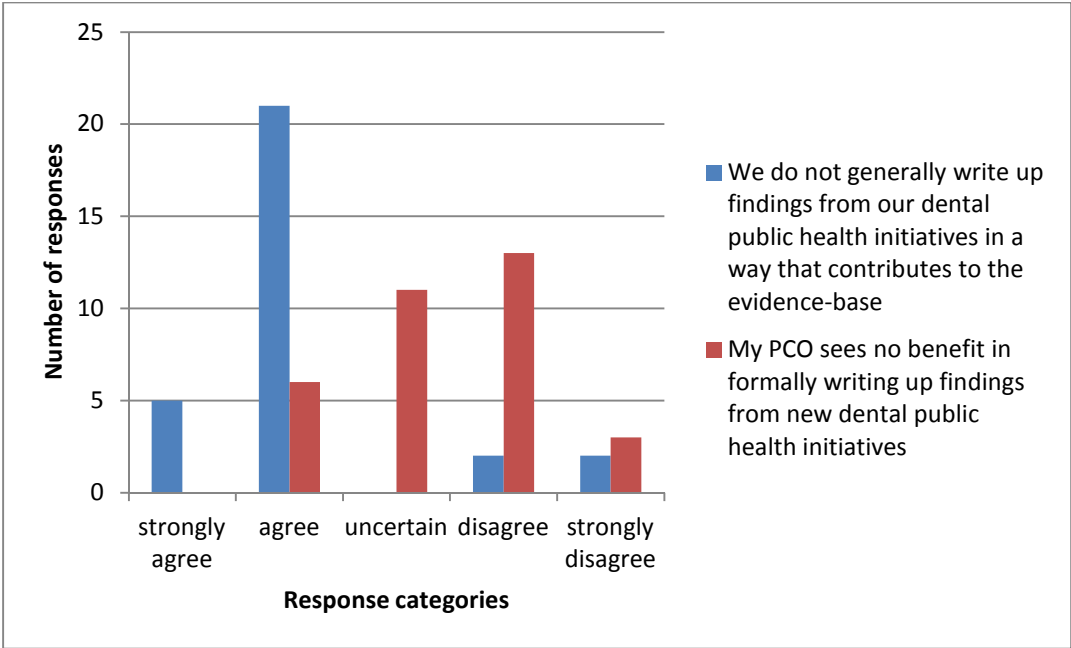


Figure 25. Distribution of questionnaire responses to statements 23 and 31

Figure 26 shows that most participants (28/31) responded that they found out about dental public health initiatives in other PCOs mainly through informal contacts (11), but with responses being more varied as to whether there were sufficient opportunities to informally share knowledge to dental public health colleagues who they did not see regularly for work-related reasons (12), with ten agreeing, seventeen disagreeing and five uncertain. Figure 26 also shows that most respondents (22/28) indicated that dental public health information-sharing happened more within a particular geographic area such as a County, PCO, cluster, SHA or sector (13). It was noticed that statement thirteen was in fact a question.

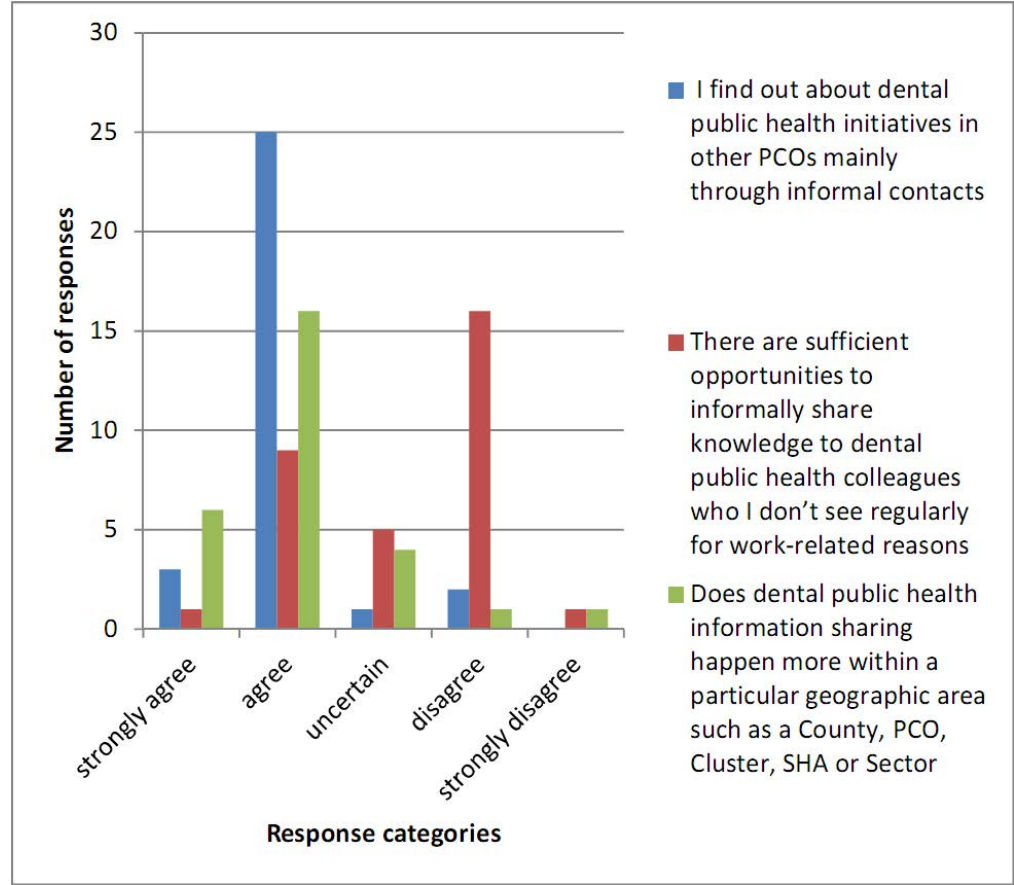


Figure 26. Distribution of responses to questionnaire statements 11, 12 and 13

Responses varied as to how easy it was to find information about dental public health initiatives carried out by dental public health colleagues who they did not see regularly for work-related reasons (7), with eleven agreeing, thirteen disagreeing, and six uncertain. Over half (22/31) responded that they had as much time as they needed for developing new dental public health initiatives in their PCO (18).

Figure 27 shows that over half (21/30) disagreed that getting a PCO decision (approval or rejection) on a new dental public health initiative was easy (22), with responses varying as to whether dental public health issues were a priority at PCO board (or other approving body) level (26), with fifteen disagreeing, thirteen agreeing, and four uncertain.

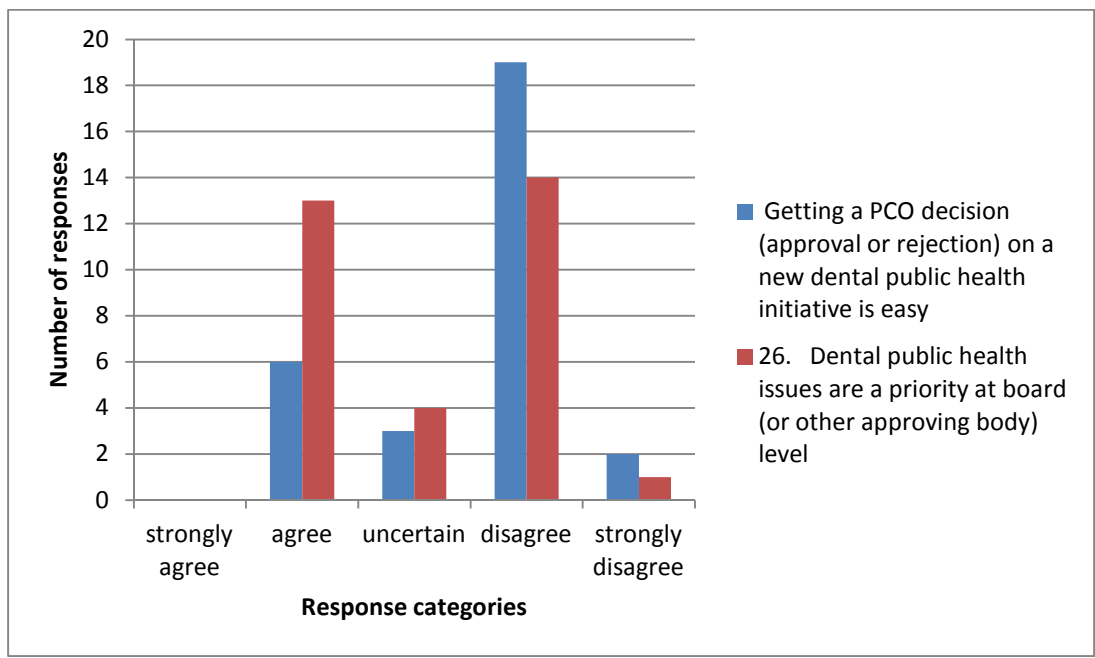


Figure 27. Distribution of responses to questionnaire statements 22 and 26

Over half (21/32) disagreed that their PCO generally started new dental public health initiatives because they were under external pressure (e.g. local Department of Health, SHA, media) (28), and responses varied as to whether appearing to lag behind other PCOs had been a motivating factor for adopting initiatives already being undertaken in other PCOs (27), with ten agreeing, fourteen disagreeing and seven uncertain.

Over half (20/33) disagreed (and no participant agreed) that the Department of Health structure worked well in facilitating the transfer of dental public health knowledge between PCOs nationally (33). Responses varied as to whether there was somebody within their PCO actively looking for new dental public health ideas in other PCOs or elsewhere (32), with twelve participants agreeing, seventeen disagreeing, and four uncertain.

Over half (19/31) perceived that they had at least one dental public health initiative that was at risk due to anticipated reductions in funding (14).

11.3.4 Organisational Change

Responses varied as to whether merging OHSs from different PCOs should be, or had been, a straight forward process (34), with fifteen agreeing, twelve disagreeing, and six uncertain. Most (25/31) felt that it was difficult to be able to plan for dental public health because of the proposed changes in the NHS (39). A narrow majority (17/33) disagreed that the proposed NHS reorganisation would have no, or a small, impact on their OHS (40). Of the remainder, seven agreed and nine were uncertain. Most participants (19/32) perceived that teams working on dental public health initiatives were being broken up as part of the NHS transformation (15). Most participants (29/31) perceived that the proposed NHS

transformation had caused a reduction of morale with the people they worked with in their PCO (17). Two were uncertain, and no participant disagreed.

In response to whether the proposed NHS transformation was likely to have a negative impact on developing dental public health initiatives (16), although sixteen agreed, twelve were uncertain, and three disagreed. Participants tended to not feel that the NHS reorganisation would eventually make it easier to implement dental public health innovation (29) with five agreeing, fifteen disagreeing, and twelve uncertain. There was also variation in responses regarding whether when the proposed new NHS structure had settled down it would be easier to share information about dental public health initiatives nationally (30), with thirteen agreeing, six disagreeing, and thirteen uncertain.

11.3.5 Free text responses

Some participants made use of the free-text section of the questionnaire. Responses are displayed in Table 3.

Table 3: Free text responses to questionnaire

Strategy	<i>"Since I cover a number of different PCTs they are all at different stages depending on historical factors eg Q43 [Our oral health strategy is integrated with the other strategies that my PCO has.] this is true/agree for some and not others."</i>
	<i>"I think we have an opportunity through the current reforms to lead and influence change. CsDPH should be at the heart of LPN development, strategy."</i>
Innovation	<i>"My PCO is always looking for new ways to reduce inequalities in oral health" added that it "depends who in PCO!"</i>
	<i>"large system gaps in the virtuous circle of research – dissemination – implementation – review due to lack of human resources and a fragmented system. Possibly things will be better in PHE."</i>
	<i>"It [information sharing] happens easier in a sha currently because we have a network. But also nationally. whatever level you have meetings."</i>
	<i>"impossible [to apply new solutions] due to cost and financial constraint."</i>
	<i>"Information sharing is very helpful but needs to be handled wisely because of ownership issues. If we are offices of an organisation then we aren't always at liberty to share material formally... but often do informally with trusted colleagues if we know they are interested – or local colleagues for whom there is helpful "regional" learning. It is uncertain how new arrangement will affect working – but we have to be bold and harness the opportunities available."</i>
	<i>"Dental public health information sharing is easy within the cluster... and I have good relationships with consultants in other clusters but not all so at SHA level not always so good."</i>
	<i>"My PCO will support me if failure is as a result of factors beyond the control of the team but not if it is due to poor planning poor implementation or poor monitoring."</i>
Change management	<i>"disagree short term – long term agree" [that it is difficult to be able to plan for dental public health at the moment because of the proposed changes in the NHS].</i>
	<i>"The effectiveness of future NHS arrangements will depend upon (a) effective collaborative working through networks within the specialty to optimise the use of limited resources and minimise duplication of effort (b) effective collaborative working between the specialty and new NHS organisations...(c) ensuring that all these organisations understand the role of dental public health...and value the role of dental public health."</i>
	<i>"We have no certainty due to transition."</i>
	<i>"The changes are so profound at the moment that it is difficult to answer a lot of these questions – e.g. "my PCO" – is rapidly changing on a daily basis and consists of individuals with different views so it isn't generally possible to answer questions about how "my PCO" acts because this isn't consistent."</i>
	<i>"Would [being easier to introduce new dental public health initiatives than it is now] depend on funding, strategic objectives and local politics in the local authorities. Will also depend on how dental public health consultants are able to link and work with public health England, local authorities and the NHS commissioning board- all of which are unknown."</i>
	<i>"It should be [straight forward to merge PCO OHSs] but in my experience it has not because individual PCOs have at times wanted their own identity e.g with solutions to similar issues."</i>
Other/multi-domain	<i>"...in some cases the answer is "it depends". We are required to be flexible with our budgets and strategies."</i>
	<i>"PCT deficit has had big impact on funding as for several years floor funded dental primary care budget has contributed to deficit reduction. Balancing books has greatest priority."</i>

11.3.6 Results in relation to years of experience

One participant did not declare their years of experience as a CDPH. The distribution of ranges of years of experience is shown at Figure 28. The number of participants in each range of years of experience was considered insufficient to attempt to draw out differences in responses to statements based on experience.

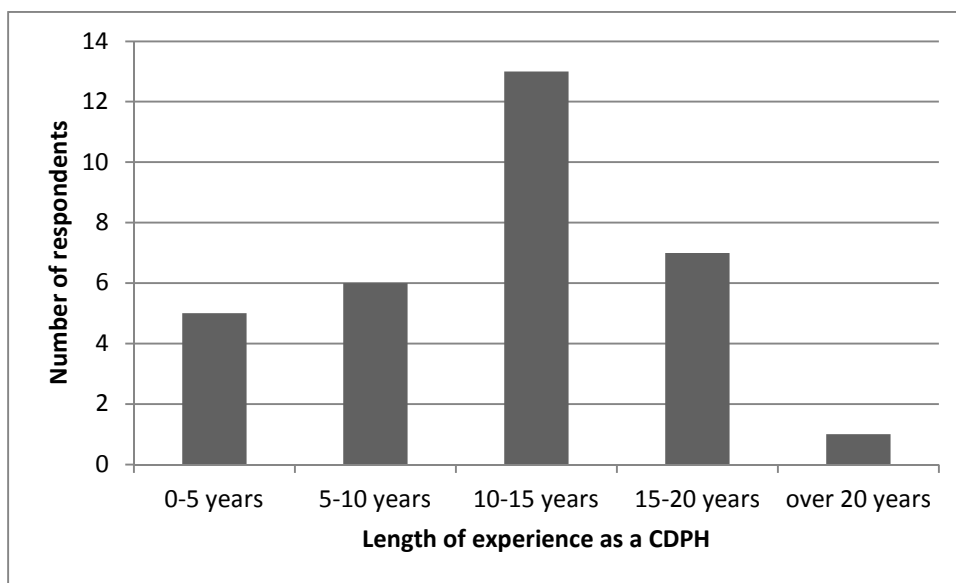


Figure 28. Distribution of questionnaire participants' ranges of years of CDPH experience

11.3.7 Results in relation to SHA region

The distribution of responding CsDPH according to the SHA area of their PCO is shown at figure 29. Because there was no way of being certain of the SHA area, if any, for non-responders (the BASCD list was not assumed to be reliable), it was impossible to determine the total number of CsDPH in a SHA area, and therefore impossible to determine the proportion of CsDPH for each SHA area that responded.

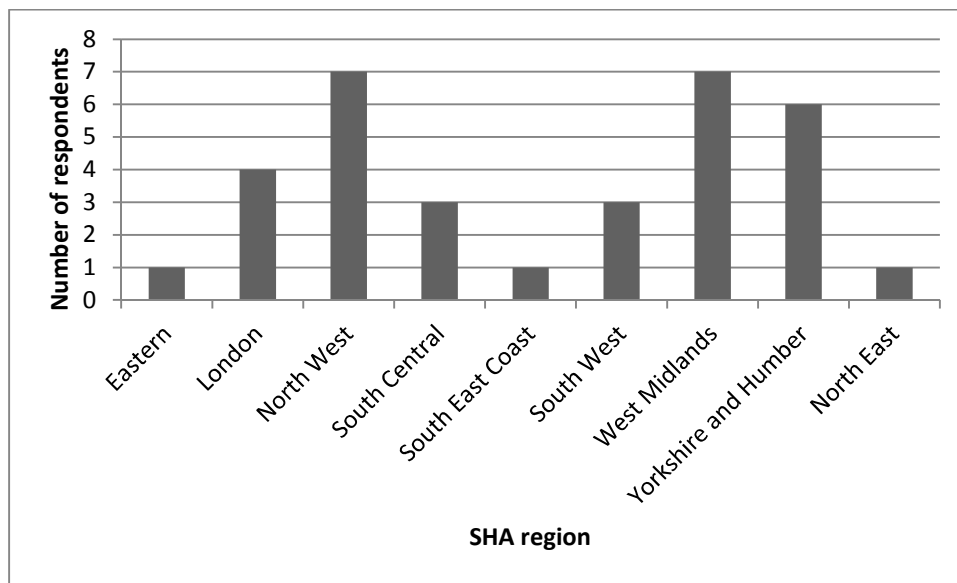


Figure 29. Distribution of questionnaire participants according to SHA area of their PCOs

11.3.8 Summary of findings

A range of structure and process factors affected strategy and innovation aimed at addressing oral health inequality. These included opportunity to disseminate, ease of getting a board decision, resource levels, and strategy integration. In addition, variation in conceptions as to what constituted innovation or strategy, found in study 2, were also found here. Responses suggested that actual strategy could frequently differ from written strategy. The number of participants in each age bracket and in each SHA area was considered too small to enable conclusions to be drawn from differences in responses to statements.

Study 3 showed that there were probable structural and process limitations impacting on the innovation process, from adoption through to dissemination. It was decided that this should

be investigated further by conducting research based on exploring the progress of single instances of innovation. Study 4 was conducted to meet that objective.

CHAPTER 12: STUDY 4 – EXPLORATION OF THE PROCESS OF INNOVATION IN PRIMARY CARE ORGANISATIONS

12.1 Methodology

Study 4 explored the process of innovating to address oral health inequality at the level of the PCO by conducting one-to-one interviews based around single instances of innovation. This research was conducted because studies 2 and 3 had indicated that further research would be justified in order to further explore findings, including possible difficulties regarding dissemination and information-sharing, structure and process factors at PCO and macro-levels, and the ongoing impact of change on innovation.

12.1.1 Sampling

The sampling was purposive with heterogeneity sought in terms of practicing demographic variation, rurality, gender and experience. Other factors included researcher awareness that an individual was associated with an innovation (in one case this was an article in the dental press) and perceived likelihood of participation. The sampling was iterative in that not all participants were decided upon at the outset and later participants were included owing to perceived heterogeneity from earlier participants. Sampling ceased when no new categories

were emerging from the analysis of the transcripts, despite having attempted to maximize the diversity of the participants.

Seven CsDPH were interviewed who described eight instances of innovation. Participants were informed in advance that innovation included anything that was new to their PCO as well as anything they considered they had invented, and that the researcher wanted them to choose, if available, an innovation that the participant perceived would help others in their field. Participants were not otherwise guided regarding which particular innovations aimed at reducing inequalities in oral health to provide.

Because the focus of the research was on the process of innovation as opposed to the innovations themselves, there was no evaluation of the success or failure of any of the projects.

12.1.2 Topic Guide

The topic guide was informed by the literature review and the research in this thesis conducted up to this point. It was trialed at a one-to-one interview, where it was found to be suitable. This initial interview formed part of the total sample, and information obtained was included in the study in the same way as the subsequent interviews. It was accepted that the topic guide could be refined as the study progressed. An additional question was added after the first two interviews (see below). The face-to-face interviews were semi-structured in that diversions from the topic guide into areas that might produce relevant data were permitted. The third set of interviews took place at a time of impending change in the NHS. The researcher sought to take advantage of this and the topic guide contained questions relating

to the interplay between change and innovation. It was considered at this stage that this thesis might have included the development of an on-line innovation-sharing facility. Therefore some questions on this were included in the topic guide. The topic guide can be viewed at Appendix 15. During the time period over which the interviews took place the researcher became aware that a national NHS programme for a web-based facility for sharing innovations was implied by the 2012 Department of Health document *The Power of Information* (387), and the researcher from that point included a question, additional to those shown on the topic guide at Appendix 15, asking whether participants thought a NHS-wide hub would be better than one just focused on dentistry or dental public health. CDPH1 and CDPH3 (the first two participants) were not asked this.

12.1.3 Participation

Out of eight individuals asked to participate, one declined because of time constraints. Interviews were conducted between October 2012 and March 2013. All interviews were face-to-face, except CDPH8 and CDPH9, which were telephone interviews. All interviews took place with the participants being at their places of work. Interviews were approximately 30 to 40 minutes in duration. All interviewees were working with at least one PCO. All interviews were intentionally conducted prior to April 1st 2013, when PCOs were abolished. CDPH7 declined to be recorded, so written notes were taken by the researcher.

12.1.4 Analysis

The recordings were transcribed verbatim and the transcripts were imported into NVivo8, a qualitative research software tool from QSR International (430). For CDPH7, the

researcher's written notes were typed up and sent back to the participant for verification. The verified written notes for CDPH7 were imported into NVivo8 and treated in the same way as the transcripts. Data were analysed by the researcher using a framework approach (400). A preliminary framework based on the research questions was expanded as new themes emerged. Transcripts and analysis were validated by a second researcher. It was necessary to redact some elements of the transcripts where there was a potential risk of participant identification. These included places of work or references to named individuals.

12.2 Results

12.2.1 The subject innovations

Participants were interviewed about the following eight projects, which they considered to be innovations related to reducing inequalities in oral health in some way, and could potentially be of help to others in their field. The code for the participant is provided in brackets. Numbers four and five were provided by the same participant. The innovations are described in broad terms in order to protect the identity of participants:

1. Commissioning a small volume service in a relatively isolated area (CDPH1).
2. Using a DCP to do oral health surveys (CDPH3).
3. Designing and delivering an oral health promotion training programme to be delivered through Children's Centres (CDPH4).
4. Transferring specialist dental workforce from one setting to another (CDPH6).
5. Using non-dental staff as the training staff for Children's Centres (CDPH6).

6. Development of a team to engage with hard-to-reach groups in the community (CDPH7).
7. Supervised tooth brushing in schools (CDPH8).
8. Joint working with local authorities to develop an oral health improvement programme. (CDPH9).

Results are presented in accordance with the final themes emerged from the framework analysis. Where partners are referred to, these are individuals, groups (including the public), or organisations that were separate from the primary adopting or implementing organisation.

12.2.2 Adoption

A consultant with a past work relationship facilitating their adoption of innovation from outside of dentistry thought that the dental field “...*should be more open to innovations that are happening outside.*” ^{CDPH6}

A partner’s appreciation of health and oral health issues was felt to facilitate adoption, along with proactive interaction and joint exploration of oral health concerns. Adoption was also facilitated where there was a recognised capacity for improvement, where funding was available, or where future cost savings were perceived. Previous work relationships facilitated engagement with a partner organisation to move towards solving problems:

“...both me and [name] had been to health scrutiny committees and whatever talking about dentistry and dental access. That is what their main interest was but in doing so naturally

we also took the opportunity to explain to them that there were pockets of deprivation where children had poor oral health and actually more dentists isn't the answer for that.” CDPH9

The role of key team members in facilitating awareness of innovations is demonstrated by:

“... it was the oral health programme manager's attention that was drawn to it and it was the fact that she was linked in with the rest of the public health department and she knew that these other programmes were going on elsewhere....” CDPH6

An evidence base for adoption was referred to as being helpful, with formal publication and university involvement lending credibility. Information about an adopted innovation also came from a conference, and a competition appeared to provide an impetus for developing innovation. However, adoption may require preceding problems to be solved first:

“...there wasn't a pressing enough case at that stage to make that commissioning decision because we were busy dealing with...demand in other areas. But once we'd met that expressed demand, we came to the position whereby we had almost a pure decision to make over no one shouting at us about access.” CDPH1

Social justice appeared to be a factor in adoption where a consultant asked: *“Is it entirely fair and reasonable...to force them to come to the main population centres for their dental treatment?”* CDPH1 The following participant was speaking generally about incentives and not in relation to their specific innovation:

“So if you are really up against the wall with resources being cut and someone provides you with a cheaper and more affordable and more effective alternative, then that is going to get you out of a hole and that’s quite an incentive.” ^{CDPH3}

The following contribution demonstrates a perception that professional cultural issues might affect adoption:

“... there might be an element of culture amongst us in terms of perhaps our confidence or whatever, I am not sure where it comes from but a reluctance to pick up something that somebody else has done because one feels well actually I should have been able to have done that myself. Or I should be able to do it differently, better or whatever....It might be a professionalised thing I think.” ^{CDPH9}

That invention occurred was shown by:

“No, we dreamt it up ourselves.” ^{CDPH1}

“As far as is known, this has not been done elsewhere.” ^{CDPH7}

The following contribution suggests that ideas generated at a local clinical level may be sub-optimally supported:

“So, there’s huge potential, clinical potential, out there to solve a number of clinical problems and as I say if they were properly supported and it was properly funnelled... there’s a lot of potential there to do it but it’s I’m doubtful of the support.” CDPH6

12.2.3 Implementation

Most participants felt they had implemented their innovation in its entirety, although one participant reported that implementation had *“...been slower than we would have liked...”* CDPH8 and another reported that the innovation was on a *“...much smaller basis than we did when we had the full project....”* CDPH4

Barriers to implementation

Organisational

Lack of funding and human resources, inadequate communications, and competing PCO priorities, were barriers to implementation. Bureaucracy and national requirements also presented barriers, particularly where they could not be quickly overcome:

“It was a nightmare trying to get HR to give a three month contract and sort it out, you know, CRB checks....You had to do safeguarding training, you know, all those things, they were not set up.... So the initiation of the project was challenging and sometimes fraught with difficulties.” CDPH4

A participant had limited confidence that expected funding would be provided:

“Is the money going to disappear right at the last minute, just as we've got to the point of spending it and now we're about to appoint somebody? I needed to go and see the finance director to make sure they got it signed off.” ^{CDPH6}

Risks were identified relating to resources and reputation:

“we had some concerns that there was going to be all this money invested in a service that no one used and then that was going to be really quite embarrassing and actually not a good use of resources....” ^{CDPH1}

Working with partners

Sub-optimal communication, establishing common ground, and establishing trust over costs were barriers. In one instance ^{CDPH8} *“negotiation”* was reported. Relative unattractiveness of the innovation to a partner could also be a barrier: *“Other things are much more attractive to schools....”* ^{CDPH8} Partner enthusiasm could be sub-optimal:

“...the reception that some of our NHS support people... got when approaching some of the centres wasn't as open door and enthusiastic as one might have hoped....” ^{CDPH9}

The following contributions illustrate the *“messiness”* or difficulty of engaging with partners:

“Actually engaging school and nursery staff to provide brushing, you can imagine the sort of messiness of that....” CDPH8

“...it took a little while for them to get their heads around what this actually meant.” CDPH6

Systemic

Prevalent work patterns were a barrier to new ways of working and it was perceived that there was *“...reluctance from [an organisation] because I think they felt it would be a threat to them....”* CDPH6 National commissioning arrangements also presented a barrier:

“Because if you are commissioning a service mainly on units of dental activity, how do you commission a service when quite a lot of somebody’s time is going to spent training or providing training sessions for people, how do we commission for that? Some of that is not entirely resolved....” CDPH6

There may be an inadequate system for obtaining information from those who have implemented similar innovations. Limited time makes this problem more acute, and other measures resorted to might be inefficient:

“We had some difficulty in obtaining guidance, support, examples of what other people had done. We had limited time, it would have been quite handy to be able to very quickly see if other people had done things without going through the, the difficulty of emailing around in

the dark and phoning people up which is always something you do without necessarily getting a lot of outcome from doing.” ^{CDPH1}

Effect of individuals

This contribution demonstrates how disagreement between individuals, as well as the NHS structure, could present barriers:

“...and sometimes it is a bit difficult to get everybody to agree on a particular approach ... and they are quite loathe sometimes to horse trade and give up and they love to say, or to do, or to show and substitute it for somebody else’s or whatever. Bearing in mind that we were working with [several] PCTs.” ^{CDPH9}

Difficulties can arise if an innovation might impact on other team members’ projects:

“...some of what was being cut were things that were quite dear to his heart... so that was not very easy.” ^{CDPH8}

Facilitating implementation

Organisational

Congruence between the innovation and the PCO strategy facilitated implementation. In addition, alignment with management orientation was mentioned by participants:

“... the people that had the power to make a decision were working together and agreed to make it happen so there was no one to say, no it can't happen.” CDPH3

“...there was a new Director of Public Health in [location] who was very keen that we do something about our appalling child dental health....” CDPH8

Available funding and human resource facilitated implementation. Time-limited funding shaped an innovation in the following case, particularly in relation to survivability:

“... the funding we got was for three months only....So, if we were able to train children's centre staff and to identify parents, they would set up a network of parents and they would continue to deliver the health promoting messages within the children's centres.” CDPH4

Key team members played important roles. Relevant characteristics included problem-solving ability and past experience:

“And where [name] was saying oh it is too difficult, she would say oh no, I've done this when I was in your position this is the way round that. At a really local level, this is the way round it and it really made things happen.” CDPH8

“[CDPH7] had the idea that community engagement was needed. A second person...worked out how to do it.” CDPH7

One participant referred to using a “*stepped implementation plan*”:

“So, I [location] worked with our clinical director...to look at the proposal, look at the advantages, look at the risks associated with it, come up with a strategy for managing those risks and then sort of developing a stepped implementation plan....” CDPH3

Working with partners

A “*champion*” in a partner organisation facilitated implementation. Implementation was also facilitated by PCO team members having good “*local knowledge*” and pre-existing contacts, sometimes because of previous employments, with partners. This allowed an individual to act as an intermediary in a problem-solving role. A pre-existing suitable network of partnership organisations, such as Children’s Centres, also facilitated implementation. Previous or current PCO partnership working facilitated subsequent engagement with the same partner. Consistency of the innovation with the partner’s priorities, including their attitude to oral health, and an ability to work within the partner’s timetable facilitated implementation. Good communication between the PCO and the partner was also important. Partner enthusiasm facilitated implementation:

“...it turned out to be tons easier than we thought because the [body] people were just so keen to do it.” CDPH6

The following contribution demonstrates how engaging a partner organisation higher in its hierarchy facilitated implementation:

“What we also did was to get, rather than go to each individual centre which we started off with and had difficulties in terms of each individual centre, was to go above them and go to the co-ordinator of the Children Centre... and so the information was cascaded from the top to the bottom saying this project, you must engage with this team to deliver this project.”

CDPH4

The following two contributions suggest that although a shared parent organisation could facilitate implementation, greater separation might also have benefits:

“... is very helpful because the [organisation] and the community dental service are in one trust so they are not in competition with each other.” CDPH6

“So, in a way it’s helpful that they are a bit at one removed from us so we ask commissioners this is what we’d like you to do.” CDPH8

A workforce introduced for another reason, being dental access, served the second purpose of implementing the innovation:

“...so we were in the game of introducing new providers. Part of the specification for that was to support, in an outreach way, this programme.” CDPH9

Raising public awareness of oral health concerns increased public engagement:

“They didn’t realise that young people would have this problem. I suppose if you’ve got a child and they have not had any dental disease you don’t think about it but when you see an eight month old child, nine month old child with four teeth in their mouth and you’ve got caries with those teeth and that child is crying or discoloured tooth or has an abscess then these are genuine issues and parents just thought we need to engage and we need to spread that message round.” CDPH4

Systemic

Accessible guidance assisted implementation. A participant indicated that what *“...made it easier was having from [a project] their website detailed protocols that we could just take and use....”* CDPH8 Local flexibility facilitated implementation, particularly with a restricted time-frame:

“We had some minor hiccups with the [organisation], they were looking for some reassurance, but ultimately, well the decision making is local so it didn’t eventually stop us.” CDPH3

“...we had to make some decisions quite quickly and so we did a very, very crude assessment and did it.” CDPH1

Ability to apply commissioning arrangements flexibly facilitated implementation:

“...we talked with the existing practices to find out whether they would be interested in supporting and if they were, we essentially did a UDA substitution....” CDPH9

12.2.4 Outcomes

No participant reported that their innovation had failed. A participant stated that the innovation had been *“...more successful than I could have ever imagined.”* CDPH7 and another stated that *“...we exceeded our targets.”* CDPH4 In some cases success could not yet be established, or was partial.

12.2.5 Transferability

No participant stated that their innovation was not transferable. A participant felt that their innovation could be applied beyond dental services, being *“...certainly replicable for the other specialties....”* CDPH6 The following three contributions show that transferability could be moderated by certain factors in other PCOs:

“If the key benefit is cost efficiencies then it only really works if you've got a [job role] who is available who wants to do it, who's willing to be trained, who meets the standard.” CDPH3

“So, any area that has challenging populations like this would benefit from it.” CDPH4

“And anywhere else where they haven't got access to special services other than privately.”

CDPH6

12.2.6 Threats and challenges post-implementation

A participant^{CDPH6} reported risk of drift back to a pre-innovation situation without appropriate support, and another^{CDPH3} mentioned potential problems with “*endlessly training*” a mobile workforce. Potential loss of, or reduced, funding threatened implemented innovations, or meant that innovations might need to lose some components. There were perceived threats posed by the forthcoming NHS re-structuring:

“...and because we are being reorganised, the money to do this will sit with the NHS Commissioning Board...and the person who will be required to manage it will be sitting in the local authority. So, whether it survives into the next financial year is another matter...”

CDPH6

“The ambiguity over the location of dental public health in the new national arrangements casts uncertainty over funding...”^{CDPH7}

A programme review and possible reductions in “*capacity*”, related to the forthcoming 2013 NHS re-organisation, were perceived to potentially threaten innovations:

“...our team will be going to local authority. Now, it may well be that we are asked to do a review of our programmes and it may well be that if there are any decisions around

amending the capacity we have to deliver, then we need to review programmes in the light of the capacity we have.” CDPH4

A participant perceived a risk of loss of scrutiny over what providers were providing in relation to innovation:

“And I just worry that in the new NHS there won’t be the people to have a close scrutiny over anything much and that it all might just drift to we do what we like really and that as long as we are having contacts then that’s fine.” CDPH8

Mitigation of threats and challenges

Post-implementation support was reported to be important for sustainability, as was the role of communication in delivering intelligence about developing problems. A participant^{CDPH3} mentioned development of a strategy for managing risks related to an innovation.

Engagement with relevant bodies could protect against challenge:

“I personally don’t think it’s a real possibility [that the innovation would be challenged] because I have had engagement with all the [locations], the councils locally, and they have prioritised child oral health.” CDPH4

The following contribution illustrates how an innovation might, at least in part, survive in another organisation:

“Hopefully, what we’ve cut is incorporated in the mainstream of a school’s programme. That is our hope.” ^{CDPH8}

Protection could come from inclusion in strategic documents:

“We also have in our ... strategic needs assessment, something on child oral health, and this project is mentioned there, and they will prioritise it and improving the health of children is in the childrens’ and young people’s plan which is a joint strategy with the local authority and the NHS.. So they will prioritise it.” ^{CDPH4}

12.2.7 Dissemination

Dissemination had taken place through conferences, presentation at an LPN, written publications, an intra-net, an accessible-to-all web-site, and social media. A participant ^{CDPH6} indicated that dissemination may need to be tailored to different areas with different demographics. Dissemination may be restricted geographically and across dental services:

“The dissemination we’ve done, A, it’s local but B... we sent this report to every single practice. But then it’s not gone widely to the professional family.” ^{CDPH4}

The following participant, having submitted to a journal, acknowledges other routes for dissemination:

“I think we are still quite old fashioned like that but it is not the only route I guess.” ^{CDPH3}

A participant^{CDPH9} perceived dissemination to have been negatively affected by not fully understanding a communication channel, in this case Facebook. Dissemination was limited by availability of resources, and “... *time spent on dissemination might impact on other job functions.*”^{CDPH7} The amount of preparation required for journal submission was a barrier to disseminating through that route. Reliance on traditional platforms, such as journals, could result in significant omissions from the view-point of those seeking out innovation:

“...there’s an awful lot which won’t appear because it will never get to that degree of being written up and analysed or analysed and written up, to really justify appearing in that format”^{CDPH1}

However, there was perceived to be no convenient information-sharing facility for dissemination and some platforms may place too much reliance on memory:

“One barrier to dissemination is that there is nothing available at sub research journal level that would be less time-consuming to prepare.”^{CDPH7}

“We all read our journals but again, when I actually need that information, I have to rely upon my memory.”^{CDPH1}

The following contribution indicates that informal dissemination occurred and that this was to a degree that outweighed other dissemination:

“We certainly haven’t published but we have used that to communicate with other areas on an informal basis. So the dissemination has mainly been informal.”^{CDPH4}

A participant felt that certain individuals “...knew to contact me and I’d only shared that innovation with them so it’s been very, very restricted. There might be other people who wanted that, who would find that helpful, but they don’t know that I know that, and they perhaps would feel constrained in contacting me.” ^{CDPH1} A consultant, when asked if they perceived lack of a mechanism for disseminating outside of their geographic work area, replied: “Yes.” ^{CDPH4} There was an expectation that a particular innovation would have been “nationally focused” and related the absence of this to the NHS structure and perceived ethos:

“... it is disappointing that it hasn’t been picked up as a kind of a more nationally focused thing. But that is the nature of the multiple PCTs and one every one for themselves....” ^{CDPH9}

There was a perceived need for dissemination to become more organised, more systematic, and centrally directed. The second contribution suggests that this might occur, although perhaps not nationally:

“...it needs, I believe anyway, to be within a clearly defined framework and with the intention that if things are good and they are shown to work, there is a clear intention then to roll them out through the system in some sort of more systematic way.” ^{CDPH9}

“... and almost I can see a [location] blanket way of doing things so each borough will be doing fluoride varnish there and tooth brushing in schools there and that will be standard in every kind of setting.” ^{CDPH8}

A consultant indicated that a “tool kit” was often not enough for dissemination and successful implementation elsewhere, and went on to state: *“Dissemination...is about training, it’s about coaching, it’s about supporting people, it’s not just about registering the idea... you need to have a back up resource which will help people actually do this thing in the way that you want it to be done which isn’t just a ticky box thing.”* ^{CDPH6} The same participant continued in a similar vein:

“Even if we did get a poster up at BASCD or a talk at BASCD or an article in a journal, that cannot capture the practicalities of actually having to do it. So although I’ve made both of those things seem very simple...there are enormous problems in getting both of them sorted out.” ^{CDPH6}

The following contribution illustrates how incentives to disseminate may be limited:

“If you publish it like we did then people get it on their CV, which is an old-fashioned type of incentive but other than that there aren’t obvious incentives.” ^{CDPH3}

There might be a tendency to retain information instead of sharing, which could increase over time, as illustrated by the following three contributions:

“... more people are wanting to demonstrate their own success and with what’s going on now within ...the NHS in particular where there is a lot of restructuring, there’s a lot of competitive stuff done, people want to really show that what they’re doing is maybe over and

above what others are doing. So, what you don't want is for somebody else to steal your idea...." CDPH4

"...And when you've got that element of competition between rivals, then why would you want to share your innovation if it gives you a market edge over your rivals?" CDPH3

"People hanging on to things because they thought theirs was the best and a bit of a reluctance to share." CDPH9

There was a tension between academic standards and the practicalities of meeting these where evaluation might be difficult or where projects are small. Academics could provide more assistance and greater collaboration between academics and implementers could develop:

"...what I am feeling and seeing in relation to the development of Public Health England is an intention for a much greater collaboration between those who traditionally have done that sort of academy sort of stuff and the operational get on and do it but don't have time to write it all up and haven't got the experience." CDPH9

"... where we've fallen down in academia is to say this is the standard, these are all the boxes you have to tick, and some of oral health promotion is very hard to evaluate well And also you can't do that for every little project...so what is a practical approach to this? I think we've fallen down a bit on and don't really help people enough with that." CDPH8

A participant^{CDPH8} perceived that there could be a “lull” in innovation “take up” caused by the NHS re-organisation. The following two contributions from another participant show how it was perceived that the re-organised NHS could either facilitate or hamper dissemination:

“It could become tons easier because it’s one NHS CB, ideas could be picked up and run with much more quickly because you don’t have to persuade individual PCT boards to do something....” CDPH6

“... because you don’t that have the local flexibility to do just what you want so now you’ve got to persuade somebody that actually this was a good idea right up there even though you’re down here. So, I think it could go one way or the other.” CDPH6

Further plans for dissemination

Routes being considered for dissemination by participants included the Local Area Team, the Local Dental Network (LDN), to “publish something”^{CDPH4}, or to “present a paper or poster”^{CDPH6} Having written an article for a journal, on being asked whether there were any further plans for dissemination, the response from a participant was “No.”^{CDPH3} One participant stated: *“I never push very much about advertising what I have been doing.”* CDPH8 Another participant, who had not disseminated, stated: *“We ought really.”* CDPH1 However, the same participant felt dissemination could be disproportionate for the innovation:

“For a conference or research I think you would need to do more than might be appropriate to a simple commissioning.” CDPH1

12.2.8 Web-based facility

In connection with this thesis, the researcher offered his assistance to the BASCD in developing a web-based repository for sharing innovation-related knowledge. This facility was not developed. Results relating to the practicalities of developing this are included at Appendices 16-21, and results that remain relevant to the foci of this thesis are retained below.

The following participant suggested that a facility for sharing innovation-related knowledge would be helpful:

“I think just a place where these things can be put up and experiences can be shared where we can have visibility on other people’s experiences and they can have views on ours [would facilitate dissemination]. In a way that is readily accessible not by going to a conference and then forgetting...” CDPH1

In relation to such a facility, a consultant indicated that *“... we could have considered sending the end of year report to there. Or even a summary of it and saying if anybody wants to talk to us about it, yes. Communicate with us.”* CDPH4

The following participant was in favour of such a facility and added that it would impact on repetition consuming resources:

“...I absolutely support that, to have evidence-based programmes with the material there and with examples of how it went, you know, really detailed help towards how you implement this. It’s wonderful and particularly where funding is difficult and everybody’s time is short. Why reinvent the wheel when it’s already been done.” CDPH8

A facility could increase sharing by engendering a perception of collective action:

“I haven’t got much motivation to disseminate but my motivation to share might be because if everyone does that, we all benefit. So I think it is probably a collective, it’s a societal action isn’t it?” CDPH1

A consultant indicated that an NHS-wide innovation sharing facility should be used instead of one just based on oral health because both presented innovations had been derived from beyond dentistry and because *“...outside should be more aware of what we’re doing in terms of innovation.”* CDPH6 Another participant felt that a facility should be accessible beyond dentistry, with *“...dental public health recognised as a bona fide part of everything along with hips and hearts and everything.”* CDPH9 However, a participant felt that because *“...dentistry and dental things just tend to get lost... I think there’s still merit in doing our own”*. CDPH8 Similarly, a participant perceived that potential unawareness of whether there would be anything relevant on an NHS-wide site would be *“...the big flaw in the NHS one...you have to want to know to be able to go there and most people would not know about it....So, if you have something that’s closer to the family, the dental public health family...you know where to go immediately.”* CDPH4

A participant felt that neither an NHS-wide nor an oral health focused innovation-related knowledge-sharing facility would ensure that good innovations would become widespread:

“...that isn't sufficient to make that large scale pick up on something that might be a really really good and perhaps even the best way of doing something.” CDPH9

12.2.9 Other issues

LDNs could be a source of innovation but might not be fruitful because of inadequate local specialised workforce levels:

“... to generate ideas from within the local dental network so that might actually help...but the thing is entirely dependent on what there doesn't seem to be which is capacity in anything to do it. So, you actually need more people... and at the moment the local areas teams are so thin on, you know they are very very thin that it's quite likely that that won't happen...because there's just too few people working in commissioning.” CDPH6

The same participant felt that flow of information from local to central was intended but was not aware of how this would occur:

“Yes, it's intended to do that but I've no idea what the mechanism is via which it's going to happen.” CDPH6

12.2.10 Summary of findings

There were barriers and facilitators for adoption and implementation of innovations. When focusing on individual innovations, participants displayed that working effectively with partners was important and that ongoing support after implementation was also important. Dissemination of an innovation did not always occur even when it was suggested that the innovation might be useful elsewhere. There was a perception that there was no facility for CsDPH to conveniently disseminate their innovation. In addition, there may be no incentive to disseminate as well as limited resources for doing this. Attitudes towards a potential innovation-related knowledge-sharing facility were variable, although participants generally appeared to be in favour of this. There was disagreement over whether such a facility should be specifically for oral health or whether a wider-ranging facility would serve better. Once implemented, an innovation can face various threats and challenges, including a loss of supporting resources. Some innovations appeared to be more protected against such threats through various means. There was disagreement about whether innovation would be easier or more difficult in the reformed NHS. The findings in study 4 were consistent with the main findings from studies 1-3.

CHAPTER 13: DISCUSSION

13.1 Methodological issues

The potential for bias in qualitative research needs to be considered. Bias can be present in different forms. The qualitative research in this thesis was conducted in accordance with the NICE *Quality appraisal checklist – qualitative studies* (421), which indicates that context bias should be considered. Context bias was considered in this thesis and it is considered that such potential bias is mitigated by differences between the participating CsDPH in terms of gender, location, having an academic position, experience, and by the differing population densities and deprivation levels for their PCO areas (see table 2).

Bias on behalf of the researcher was recognized as a potential risk. This was mitigated at the analysis stages of the qualitative elements of this research by having a second researcher verify the analysis and the determining of emerged themes. The second researcher, a dental academic, was of a different background to the author. Attempts were made to mitigate bias on behalf of the researcher during interviews through awareness by the researcher of the risk of such bias and by maintaining a neutral attitude during interviews, including avoidance of non-neutral feedback during the interviews.

The possibility of response bias (491) needs to be considered in relation to the results from the questionnaire in that those that did not respond could have had different attitudes to those that did respond. There is also the possibility of response bias where individual statements

were not responded to by all questionnaire participants. However, any effect from this is likely to be low because all statements were responded to by all or nearly all participants, with the lowest response being 28/33 for statement 13 (Appendix 12).

Caries prevalence is generally skewed (492). Mean values, including d_3mft mean values, are not capable of demonstrating distribution parameters such as skew. Therefore, in a particular population there could be a high prevalence of caries experience for a small proportion of that population whilst the remainder of that population has little or no caries experience. Using the mean d_3mft value in this case does not capture the implications of this distribution for commissioning, and similarly might not capture the different implications for commissioning deriving from further different distributions. Masking the higher prevalence of caries in a part of the population, by focusing on mean d_3mft , could also result in oral health strategic misalignment with that part of the population. However, the mean is related to the summed values of d_3mft , accommodating, even if also masking any skewing, and it was considered reasonable to hypothesise that per capita commissioning volumes would rise with rising mean d_3mft .

Using d_3mft provides no information about the distribution across the d_3t , mt and ft components of the index. Commissioning volumes might be expected to be better associated with the d_3t component because d_3t is a better indication of treatment need with regard to caries than mt and ft , which are more an indication of treatment history and the successful gaining of access to treatment. However, it is evident from the 2007/2008 Dental Epidemiology Programme data that the mean d_3t increased as mean d_3mft increased across SHAs (493).

Commissioning is for all necessary care and not just the treatment of caries. Even when practitioners submit claims for UDAs where caries has been addressed, the number of UDAs claimed is a poor indication of the number of carious teeth treated within a banded course of treatment. So commissioning a particular volume of UDAs may result in different numbers of carious teeth being treated in different instances. Additionally, the metric of d_3 (decay obviously into dentine using visual methods only) does not include caries that might be found by additional means, such as the taking of radiographs. Despite the limitations described above, d_3mft data are widely available and there is a robust collection mechanism in place.

A difficulty in searching for Oral Health Strategies was that not all such documents carried that title. Therefore acceptance criteria were developed, as described in the methodology. The researcher accepts that different acceptance criteria could have affected the results. It was felt to be important to exclude some documents by means of acceptance criteria because such documents presented only access or distance standards or applied only to children or other population sub-groups, and therefore could not be considered to be complete OHSs.

13.2 Focusing on the local level

The findings from studies 1 to 4 indicated that there was a range of factors that affected strategy and innovation aimed at addressing oral health inequality at the level of the PCO. The researcher perceived that some of these factors pertained more to local issues, and some had a more central or national dimension. The discussion proceeds in accordance with this perceived distinction. However, some factors could apply at both local and national levels.

An additional intended advantage of conducting the discussion according to local or national level was to permit some integration by moving away from considering innovation and strategy separately. Where contradiction or inconsistency was observed, development of the discussion was supported by dialectic and functionalist approaches (see Appendix 13).

Findings revealed problems corresponding to the domains of structure and process, suggesting a negative impact on outcomes according to Donabedian's model of quality in health care (1). Structurally, there were reported difficulties in obtaining and retaining resources, including workforce, time and funding. This included access to a CDPH. Staff turn-over was a problem, including where organisational knowledge was lost when somebody left. Process factors include not following strategy, having no apparent strategy, or having no intention to disseminate useful innovations. Potential dysfunctions, described subsequently, could be outcome problems.

13.2.1 Local-level bureaucracy

There was a bias towards innovation in PCOs, facilitating adoption and implementation. Taking PCOs to be bureaucratic organisations, Mintzberg's (1983) suggestion that such organisations are biased away from innovation did not therefore apply (282). The researcher considered PCOs as bureaucratic because many components of Weber's ideal type bureaucracy (452) were apparent in PCOs. Perhaps central exhortations for PCO innovation reversed the bias, or perhaps bureaucratic change occurred related to a market reorientation in public sector organisations, as indicated by Mintzberg (282), and consistent with New

Public Management's (353) claimed bias towards innovation (354). Nonetheless, PCO bureaucracy appeared to sometimes hinder innovation.

13.2.2 Inequality and strategy

Despite official statements calling for PCOs to develop strategies to address oral health inequalities, this research could only find strategies that fulfilled the acceptance criteria from just over one third of PCOs, complementing the 2009 BDA questionnaire (453) to dental leads asking if PCOs had "*dental strategies*". The BDA survey, with a 47% response rate, indicated that a much higher proportion of PCOs had a strategy (81% of respondents) than was found in this research. A later BDA survey in 2011 (with a 69% response rate) found that only 2% of PCO dental leads did not have a "*dental strategy*" (454). The BDA surveys may have induced response bias and the use of the term "*dental strategy*" allowed for the inclusion of a wide range of documents that might have failed to meet the acceptance criteria for an OHS in this research. In this thesis, the analysis of OHSs against deprivation values showed that we have no reason to conclude that there was any particular association between deprivation in a PCO area and the development of an OHS. The Mann-Whitney *U* test *P*-value (2-tailed) was, however, just greater than the 0.05 level. The presence of an OHS appeared to be related to SHA grouping, suggesting that SHA factors may have been influential. Although it was clear that SHAs were to monitor the strategic direction of PCOs, examples of statements relating to OHSs were difficult to find. The data did not explain the OHS distribution among SHAs, but could be related to the availability of CsDPH, or other resources, to produce strategies. Absence of an OHS would have been dysfunctional if the absence of strategy meant loss of efficiency or effectiveness, or resulted in divergence from central guidance. However, there is no evidence that PCOs without an OHS performed

worse than those who did have an OHS. In addition, strategy may have taken another form or the PCO may have perceived an OHS to be of limited utility of (see below).

Owing to change, written strategies can become outdated. This research found that strategy was sometimes seen as being under constant review and renewal. Some PCOs adapted by having a flexible “*implementation plan*” in addition to an OHS. Although this can be problematic in establishing what the strategy is, this is consistent with the concept of emergent strategy, as described by Whittington (2001) (281). Mintzberg’s observations (1978) that “*realized*” strategy may be different to “*intended*” strategy and, similarly, that “*emergent*” strategy may be different to what is set out “*a priori*” in a written strategy, also seems relevant (280,455). The questionnaire findings indicated a strong possibility that much strategy lies outside of what is in a written strategy. Accepting a wide definition of strategy to accommodate this leads to a position where the total amount of strategy, or its contents, cannot be verified. The researcher cannot confirm unwritten strategies or how these might differ from written strategies. Divergence of actual strategy from the OHS may be functional in that it decreases reliance on out-of-date OHSs.

An OHS might not result in reduced inequalities, even if that is an objective. Strategies may fail, be less effective, or not be implemented, for various reasons including a failure to adapt to changing contexts or inconsistency with organizational factors (281).

13.2.3 Senior decision-making bodies

Senior-level PCO appreciation of oral health issues facilitated innovation adoption and implementation. Lack of this may provide a barrier, resulting in ideas being frustrated, remaining dormant or not being provided. This would be dysfunctional because it would work against central exhortation to innovate locally to reduce health inequalities, and because innovations of equal merit (or, even, the same innovation) could be implemented differently across locations according to variable senior-level appreciation of oral health matters. In study 4, managerial factors were not prominent as barriers to innovation implementation, possibly because adoption of the presented innovation would not have occurred if it had conflicted with these.

Competing PCO priorities can delay or prevent innovation implementation, and threaten implemented innovations. Robinson *et al.* (2011) indicated that the financial crisis had made PCO priority-setting more important (456). Although losing funding would threaten implemented innovations, these could be protected if included in PCO strategic documents. An implemented innovation can also survive by being taken over, at least in part, by another organisation.

OHSs received board sign-off and it might therefore be expected that board decisions would reflect the OHS. However, a board had no obligation for such consistency, and disruptive factors may have included financial constraint and a need to prioritise, exposing a disparity between decisions rational for the PCO and decisions rational for individuals or smaller groups (292). A tension described by Argyris (457) between “*espoused theories of action*” and “*theories-in-use*” can be discerned. PCO boards may therefore have sometimes hindered implementation of their own PCO’s OHS, perhaps dysfunctionally, but also possibly serving

the function of allowing boards to prioritise across a range of health services. Speculative explicatory factors include Child's (1972) concept of "*strategic choice*" (283), including the influence of dominant members or groups on decision-making, perhaps compounded by the difficulty and expense of objectively considering all options and consequences, referred to by Hogwood (1984) (291 p. 50-52). The second and third dimensions of power, described by Lukes (2005) (287), may have been exerted, with decisions averted and agendas controlled. Decision-making may have occurred within Simon's (1957) "*bounded rationality*", with resultant "*satisficing*" taking place (293) Dopson's (2005) indication that interdependencies, balances of power and varying agendas in organisations may hinder NHS innovation is consistent with this thesis (319). Chestnutt et al. (2014) found that CsDPH felt: "*Getting and keeping oral health on the agenda of Local Authority health improvement programmes was a concern* (133)." This suggests that the above speculations may continue to apply following the 2013 health care re-organisation.

13.2.4 Risk

Innovation can help to address change and improve services. However, innovation implies risk as anticipated benefits may not occur. Public money is also at risk along with PCO and individual reputations. There may be a "*tried and tested*" solution in place and uncertainty whether innovative solutions would be better. These factors may lead to innovations being adopted where the risk of failure is considered low. This research suggested that a formal assessment and a "*stepped implementation plan*" could help determine and manage risks, which seems a sensible approach considering the finding by Van de Ven *et al.* that innovation implementation is not uncommonly punctuated by setbacks (14 p. 10).

If the “*tried and tested*” ways are working there may be no impetus for looking at innovative solutions, consistent with the assertion by Van de Ven *et al.* (1999) that an organisation may need a “*shock*” to turn to innovation (14 pp. 28-30). All participants’ innovations had been successful, sometimes more successful than anticipated, perhaps because of wise adoptions, high risk adversity, good implementation, or because participants preferred to discuss successful innovations. This research did not reveal instances of negative unanticipated consequences (458).

Although consultants tended to perceive that their PCO was not too risk averse, there was uncertainty whether individuals would be supported if a PCO-approved risk was taken that played out adversely. This is consistent with Van de Ven *et al.* (1999), who found that the “*maxim*” of letting people fail was “*seldom operative*” (14 p. 62). Van de Ven *et al.* (1999) also suggested the possibility of attribution bias with innovation teams being blamed for failure and management taking excessive credit for successes (14 p. 59-62). Although not specifically looked for, this research did not uncover such bias.

The inability of PCOs to rapidly change health-related behavior could conflict with a PCO’s preference for quicker improvements. PCO strategic time-frames may differ from that suitable for implementing and evaluating some innovations, resulting in possible premature resource withdrawal because of a “*two timescales problem*”, although Sorell’s (2003) original usage related to the political cycle (366). Wasted sunk costs at premature resource withdrawal would be dysfunctional, as would be the failure to contribute to evidence bases through the lack of evaluation. Additionally, advance exclusion of potentially beneficial innovations not fitting PCO time-frames could also be dysfunctional. However, this “*short-*

termism” problem of innovation being inhibited by the exclusion of innovations not matching a time-frame, as indicated by Mulgan *et al.* (2003) (300), was not apparent from the research in this thesis, although it could have been present. Nor did this research demonstrate implementation avoidance because of perceived future resource withdrawal, as suggested could occur by Scheirer (1990) (335) and Gill (2009) (313).

13.2.5 Resources

OHS development and innovation implementation imply resource consumption. However, although benefits may be perceived, there may be inadequate resources. Therefore, where a proposed innovation, or strategy, with perceived benefits is inconsistent with resources, it may be not developed, not implemented, or compromised and partly implemented.

Development of subsequently undeliverable innovation or strategy would have been dysfunctional because resources would have been wasted. Non-implementation of beneficial innovations would have been dysfunctional at a time when the NHS centrally was calling for local innovation. However, a PCO could not be expected to implement a strategy or innovation that it could not afford, even if beneficial outcomes were anticipated. In study 4, lack of resources did not emerge as a barrier to innovation implementation, perhaps because innovations were not likely to have achieved implementation, and thus become available as a subject for interview, without such resources. It is unknown whether inadequate resources could partly explain the observed absence of an OHS at some PCOs. Limited resourcing is also relevant to conflict between resource deployment to deliver the PCO’s strategy and deployment to solve contemporaneous difficulties, which may not be in the strategy.

This research found that OHSs may not have been integrated with other PCO strategies, perhaps partly because of limited team interaction and perhaps because other teams may not have sought dental public health input. Integration suggests greater efficiency by avoiding dysfunctional duplication and contradiction. This is consistent with Salaman and Asch's observation (2003) that organisations may pursue multiple strategies that may clash (295 p. 54). Perhaps the opinion of Watt and Sheiham (2012) that the common risk factor approach had facilitated integration of oral health into general health strategies (114) is correct, but there may be further to go.

PCOs may have been under-resourced in converting data into usable information. This may have been because it was nobody's role or because of absence of appropriate workforce. Therefore, information is gleaned from data according to the ability of the PCO, or the CDPH, to do this, which may be variable. It is possible that data were therefore not always fully interrogated, which would be dysfunctional if subsequent decisions were made based on such partially interrogated data.

Some PCOs had to operate without the assistance of a CDPH, which appears dysfunctional, based on an assumption that resources should be deployed according to need, as there was no indication that those without the assistance of a CDPH needed it less.

13.2.6 Partnerships

A prior relationship may facilitate innovation adoption and implementation requiring partnership, as did a pre-existing network of relevant organisations. A partner's appreciation of health, including oral health, issues facilitated innovation adoption and implementation.

Sub-optimal partner interest and enthusiasm, or conflicting priorities, may hinder innovation implementation, as could difficulties in establishing common ground or trust, including over financial matters. With multiple potential partners, some may be late adopters, as additional innovation processes take place at a sub-level below the overall innovation process. A participant at study 4 felt individuals varied in time required to understand the innovation's implications for work practice, consistent with Ham's observation (2003) of "*...inertia built into established ways of working* (365)." Good communication with partners facilitated innovation implementation, as did engagement with the partner organisation higher in its hierarchy. Partners being under the same parent organisation facilitated innovation implementation, although greater separation could also hold advantages. These differences with regard to a parent organisation may moderate how partners are best engaged. Where public involvement was required, good knowledge transfer between members of the public, and raised public awareness of oral health concerns, facilitated innovation implementation.

13.2.7 Innovation support

Available support from individuals with experience of the innovation appeared to facilitate adoption and implementation. Such support was also considered important post-implementation, consistent with Scheirer's (1990) findings in research on mouth rinse programmes (335), and with Ricketts *et al.* (2003), researching the development of new protocols in the field of mental health (312). Implementation was facilitated where there were easily accessed protocols to follow. A participant's indication at study 4 that dissemination may require tailoring to different adopters appears sensible in that PCOs differed. Premature withdrawal of post-implementation support could risk drift back to pre-innovation conditions. However, the importance of post-implementation support may be

unappreciated and might require unavailable resources. Failure to provide required support could endanger implemented innovations, leading to a risk of dysfunctionally wasting resources.

13.2.8 The role of individuals

The quality of team members was perceived to facilitate innovation implementation. Individuals may have important relevant characteristics including problem-solving ability, work experience, local knowledge, and pre-existing contacts with partners allowing individuals to act as intermediaries. Another key individual was the “*champion*” in the partner organisation ensuring innovation implementation. Key individuals facilitated partner engagement in problem-solving at implementation and post-implementation. The benefit of individuals communicating across domains, or being “*champions*”, has been recognised (302 p. 308-311) (325,335,340). Disagreement between individuals can hinder innovation implementation, including where implementation impacts on the projects of others. OHSs were developed with a range of stakeholders, helping to imply stakeholder “*ownership*”. However, wide involvement increases the possibility of conflict. Such “*ownership*” could be functional in allowing implementation. However, there is a risk of dysfunction if exclusion or inclusion in an OHS becomes a political process rather than evidence-based. Findings suggested that qualities often referred to in the literature as components of good leadership, in particular transformational leadership (459), may facilitate innovation implementation. Persistence was a feature of one participant at study 2 who also suggested that every idea has its time, consistent with the concept of opening and closing policy windows (460).

13.2.9 Dissemination of innovation

Means of dissemination included conferences, workshops, the Department of Health, social media, a local newspaper, a website, e-mail, PCO publications, and an academic journal. A participant indicated that dissemination was beyond specifications and another suggested that dissemination could be disproportionate. Others had no plans for dissemination despite perceiving that it might be a good thing to do. This permits enquiry as to whether dissemination would have occurred with lower perceived barriers or greater clarity over perceived means. CsDPH appeared to vary in their perceived limited capacity to disseminate, with lack of time, including for preparation for formal dissemination, workforce and finance contributing. Where an innovation had been implemented, time was diverted more to post-implementation support than to dissemination. Limited incentives for dissemination, observed in this research, were recognised as a barrier for adoption and dissemination in *Innovation Health and Wealth. Accelerating Adoption and Diffusion in the NHS* (2011) (382). The raising of the possibility of Area Teams and Local Dental Networks (LDNs) performing dissemination functions, and being potential sources of innovation, is consistent with the NHS structure as at 2015.

A participant's suggestion, at study 4, of reluctance by CsDPH to adopt something done by somebody else implies significant difficulties for the diffusion of innovation. However, the researcher cannot confirm that such reluctance exists.

13.2.10 Other matters

Adoptions of innovation were from beyond as well as within dental services, although no participant referred to adoption from beyond health services. Within innovation, invention also occurred. The benefits of innovation adaptability was noted by Durlak and DuPre (2008) (12), and PCOs appeared to adapt innovations to local circumstances. Innovations consistent with PCO strategies or priorities were more likely to be adopted or implemented. Exploration beyond the PCO may have increased awareness of innovations. However, this research found that sometimes this may have been nobody's job and may have depended on intrinsic motivation or on individuals having particular external contacts. This would have been dysfunctional because absence of exploration for innovation would be inconsistent with central exhortations for local-level innovation. Consideration of innovations by a CDPH may be hampered by time being filled in maintaining a *status quo*.

The researcher notes that epidemiological data available at local-level are periodic, and there can be long time-intervals between successive studies. The researcher suggests that it must sometimes be difficult to evaluate innovations where recourse to epidemiological data would be the ideal way of doing this. Without the prospect of having sufficient data for evaluation innovations may not be adopted or implemented.

Organisational climate may moderate individuals' abilities to think innovatively, consistent with Plsek's (2003) suggestion that NHS innovation requires support from aspects of the organisation's culture (461).

The reason why more questionnaire responses were received from CsDPH based in particular SHA areas is not known. Non-responders by definition had not indicated the SHA area to which their work related. The BASCD list (450) was not assumed to be reliable for determining SHA areas for non-respondents because of the risk of subsequent changes in job location or job role. In addition, there was no resource in the public domain that the researcher could find that indicated which PCOs had a CDPH. Therefore, this research did not determine the proportion of CsDPH for each SHA area that responded. Nonetheless, for Eastern, South East Coast and North East SHAs, only one response was received from each, but for North West and West Midlands SHAs, seven responses were received from each.

13.3 Focusing on the national level

Findings revealed problems corresponding to the domains of structure and process, suggesting a negative impact on outcomes according to Donabedian's model of quality in health care (1). Structurally, for example, there appeared to be no effective national framework to support relevant innovations, including their dissemination. Some processes appeared absent or vague, including how some innovations might contribute to the evidence base, or how the balance between central control and local flexibility was to be struck. The uncovered contradictions and inconsistencies relating to innovation suggest that the ability of PCOs to meet the QIPP challenge (378,379,462) may have been hampered. Continuation of dysfunctions in the re-organised NHS would be inconsistent with the focus on efficiencies and innovation in the NHS *Five Year Forward View* (273). The contradictions and

inconsistencies found in this research suggest that there may be capacity for “...*meta-innovation – an innovation in the way we innovate* (463).”

Findings suggested that sometimes greater priority was attached to meeting activity (UDAs) or “*access*” requirements than was attached to quality of service provision. This tension between activity/access metrics and quality of service could amount to a dysfunction if distraction away from quality had resulted in loss of quality, which this research did not show. The tension could, however, provide a function of maintaining quality at the same time as attempting to achieve access and activity metrics.

13.3.1 An innovation-strategy complex

Rather than being an overt empirical finding, simultaneous consideration of strategy and innovation in this thesis allowed the researcher to recognise that to a substantial extent strategy may be innovation and innovation may be strategy, accepting the definition of innovation in this thesis. Much strategy can be viewed as a portfolio of implemented or intended innovations. This interplay between strategy and innovation may be under-recognised and may have implications for the extent that we should consider strategy and innovation separately, an approach that is currently prevalent. The researcher suggests that an integrated approach to strategy and innovation is fundamental to understanding the inter-relation between innovation and strategy. The researcher suggests the possibility of a single entity that could be referred to as an innovation-strategy complex. The researcher is aware that this concept sits uncomfortably with the concept of an “*innovation strategy*” (464,465). This thesis commenced from a position consistent with “*innovation strategy*”, but subsequent thesis development made that concept seem problematic.

13.3.2 Inequality and other variables

Analysis of individual secondary data-sets revealed the uneven distribution of per capita UDAs commissioned, average deprivation scores, and mean d₃mft scores in 5-year-olds. Gini coefficients disclosed the inequalities in the distribution of these variables. However, as we know that deprivation is uneven across the country, and that caries experience is related to deprivation, inequalities in each of these factors, as displayed by the Lorenz curves, was to be expected. Similarly, as caries experience is unevenly distributed one would not expect UDAs commissioned per capita to be evenly distributed. What the analysis of Lorenz curves and the calculation of Gini coefficients allow us to do is to put a figure to the inequalities, which might be compared to future values. It is also possible to say that if inequalities in oral health reduced, then inequalities in per capita UDAs commissioned might be expected to follow at some point. Alternatively, if deprivation inequality reduced then that might be expected to be associated with reduced oral health inequality and reduced inequality in per capita UDAs commissioned. However, since this component of the research was undertaken there has been further movement away from using the UDA as the sole commissioning metric, with the issuing of PDS Plus agreements (466) and the development of contract reform pilots (467) and prototypes (275). In addition, UDA substitutions may occur for other services provided, as illustrated by one of the subject innovations at study 4 (see sub-section 12.2.3).

Associations between secondary data-sets, for rankings and actual values, were present, but might be weaker than expected. For example, the R² value for the correlation between UDAs commissioned per capita and mean d₃mft in 5-year-olds was 0.13, suggesting that

approximately 87% of the variation is explained by other factors. R^2 values for the bivariate analyses varied from 0.1 to 0.28 (excluding the correlation between caries experience and deprivation, presented at Appendix 6, which was 0.42) so similar comments can be made about all of the correlations, although an R^2 of 0.28 is clearly a stronger correlation than an R^2 of 0.1. Correlation between IMD (2007) and per capita UDA commissioning may have been moderated by the limited correlation observed between IMD (2007) and d_3mft in 5-year-olds, which, for actual values, had an R^2 value of 0.42 (Appendix 6, fig. 36).

Correlations for actual values were different from when rankings were used. This may be due to the artificial regularity imposed by ranking. It is of concern that there is low correlation between deprivation, oral health and apparent levels of dental commissioning. Assuming that this pattern of provision is founded in historical workforce distributions (from a time when contractor primary care dental services were not commissioned) and subsequent PCO financial allocations, this gives the impression of a systematic entrenchment of inequality of opportunity to address oral health priorities that are based on needs, rather than demand. Disparity between commissioning levels and need could be seen as potentially dysfunctional. However, any association between need and demand in any area was unknown, and over-commissioning based on ever-estimating associations between need and demand would also be dysfunctional.

The quantitative analysis of per capita commissioned UDAs complements the 2009 research undertaken by Frontier Economics (221), which analysed per capita UDAs against proxies for income such as job classification and education, but not against deprivation scores or dental epidemiological data, which this study has done. Frontier economics observed a

negative association between proxies for increasing income and per capita UDA commissioning. Their results were therefore compatible with the findings of this thesis.

13.3.3 Semantics

This research shows that CsDPH varied in what they understood by the terms “*innovation*” and “*strategy*”, which have been undefined when used in official publications (102,124,128). Making sense of these words therefore requires potentially variable personal interpretation. Differences between interpretations and intended meaning could result in dysfunction because local action may not reflect central intention. However, unspecified meanings could serve a latent function of allowing flexibility in transmission and reception, consistent with Wittgenstein’s assertion regarding definitions: “*Isn’t one that isn’t sharp often just what we need (278)?*” Additionally, precise definitions might be unhelpful, be unnecessary for utility, and result in questionable status for items not matching these definitions (278). The researcher cannot confirm authors’ intended meanings of “*innovation*” or “*strategy*”, and is unaware of evidence of central recognition of potential benefits to semantic imprecision (such imprecision would then be functional) in documents relevant to this thesis. However, Pollitt (1990) considered the utility of public sector “*woolly wording*” in that “*...it provides endless opportunities for defence, evasion and apparent innovation during the process of political debate*”, and accommodates a lack of central consensus (357 p. 122).

13.3.4 The centre-periphery dialectic

OHSs at PCO- level were desired centrally and CsDPH were aware of instructions to take into account national guidance when formulating an OHS. However, developing an OHS involved examining and including local factors. Therefore, CsDPH may have had to balance national and local factors in their OHSs, possibly compromising the role of either. This tension could be functional in limiting loss of central control over local-level strategising, but could be dysfunctional if an OHS were to be excessively skewed away from local factors. Although CsDPH varied in their adherence to national guidance on strategy, this research showed central guidance sometimes moderated a focus on local factors.

Such centre-periphery tensions have been recognised by Pollitt (1990) (356), Ham (2009) (352 p. 207) and Klein (2006) (351 pp. 262-263). Blau's (1955) finding that individuals in organisations might apply guidelines flexibly to improve effectiveness, or where they present a barrier (429) is consistent with some of the findings in this thesis. Lipsky's (1980) concept of street-level bureaucracy seems relevant because bureaucratic requirements were not always followed (339).

OHSs were sometimes produced only because it was perceived to be mandatory, and OHSs were sometimes perceived to be largely duplicatory and prone to being ignored, challenging the value of developing additional strategies. OHSs can be viewed as an "*externally imposed innovation*", with associated risks of poor local engagement, as described by Van de Ven *et*

al. (1999) (14 p. 56). This research does not demonstrate limited engagement, or whether some OHSs were not developed for perceived rational reasons.

The dental commissioning arrangements presented a potential barrier to innovation implementation, as did prevalent professional working patterns. The NHS primary care structure presented a barrier to innovation implementation because of the volume of organisations and individuals from whom agreement was needed. Consistency with the regulatory framework facilitated innovation implementation.

13.3.5 Evidence bases

Ideally PCO innovations would be subject to evaluation in a way that contributes to evidence bases. However, there were sometimes inadequate resources to develop material for formal publication, with perceived limited options for alternative information-sharing. PCOs may therefore retain innovation-related knowledge unsuitable for formal publication, but of utility to the wider dental community. This appears dysfunctional because evidence-bases are not maximised contemporaneous with a central emphasis on evidence (107,110). However, the researcher cannot confirm whether evidence bases will always be appreciated. Sheaff *et al.* (2009) found that PCT policy innovations sometimes had no evidence base (326) and Fitzgerald *et al.* (2002) found in health care “...no direct association between the robustness of the scientific evidence and the speed of diffusion (325).”

There is a tension between academic standards and the practicalities of meeting these standards where evaluation might be difficult or where projects are small. Academic

engagement could assist evaluation and help to determine whether findings should be researched further, should contribute to research streams, or could contribute to evidence bases. Academic engagement could also help decide whether to disseminate. Greater collaboration between academics and implementers could develop in the re-organised NHS.

An evidence base facilitated adoption of innovation. However, an evidence base may be absent or inadequate. Adoption with lack of evidence implies higher risk of failure and loss of resources. PCOs therefore had to decide based on available information, which could have been less than ideal.

13.3.6 Dissemination and information-sharing

Some participants appeared more active in seeking out new ideas. The opportunities for doing this appeared, however, unequal. Some, perhaps related to their work history, had better access beyond dental services, or to innovation sources or holders of information. This, perhaps unsurprisingly, facilitated adoption, consistent with research demonstrating that connections between individuals across domains facilitated innovation (328,329), and with research indicating the significant role of informal communication in innovation (335) (310) (327). There is a risk of dysfunction where an individual's informal contacts may not hold the best available innovations, although informal communication serves a possible latent function of allowing dissemination to occur in the absence of a formal dissemination framework. Although CsDPH sometimes found out about innovations informally, there may be inadequate opportunities for relevant informal communication at national level, with informal knowledge exchange occurring more at sub-national levels. This appears dysfunctional because such geographically-bounded dissemination appears to serve no

purpose, except where particular issues are sub-national, and could hinder dissemination of beneficial innovations. The suggestion that ideas generated at clinical level may be sub-optimally supported for dissemination through the NHS warrants further investigation.

Dissemination of beneficial PCO innovations may be sub-optimal, regionally-bounded, restricted to particular individuals and meetings, with no perceived convenient facility for wider dissemination. Where formal publication did not occur, there was perceived to be nowhere to submit, or from where to retrieve, innovation-related knowledge on a national scale. In addition, PCOs may not disseminate as there may be no value attached to this activity. There was no indication that the centre effectively and routinely helped disseminate beneficial innovations nationally, consistent with national innovation “*architecture*” being inadequate, as indicated in *Innovation Health and Wealth. Accelerating Adoption and Diffusion in the NHS* (2011) (382), which also stated there should be “...*more accessible evidence and information about new ideas* (382).”

Findings suggested that potential disseminators and potential adopters might find a web-based repository for sharing innovation-related knowledge useful. Reliance on traditional platforms, such as journals and conferences, results in omission because much does not get written up to the required standard. Innovation-related knowledge might reside in individuals unknown to others, and communication barriers might exist. A searchable repository could make knowledge retrieval less reliant on memory. An inadequate system for deriving information from previous similar innovations, with limited CDPH time available for searching, and informally-derived knowledge being limited and unreliable, risks dysfunctional wasting of resources on duplication. The Department of Health document *The*

Power of Information (387) mentioned NHS Choices and the Health and Social Care Information Centre in relation to providing a “portal” for NHS-wide information-sharing from 2013. However, at 2015, the researcher finds no national facility for sharing innovation-related knowledge for oral health that does not rely on formal publications. However, innovation may not increase just because sharing of innovation-related knowledge increases, and such sharing might not be enough to ensure that the best innovations become widespread. The research revealed concerns that information-sharing could be undermined by a tendency to hold on to information, particularly if it had commercial value, and that this could become worse.

At study 4, participants presented innovations that they felt could be useful elsewhere. The researcher cannot confirm the relevance of the positions of Downs and Mohr (306), and Damanpour (7), regarding the limitations to the generalisability of innovation transferability according to organisation type, because the researcher is not aware of studies into how similar or different PCOs were. However, the researcher considers that PCOs must have been significantly homogenous because they had similar roles and responsibilities and similar structures.

13.3.7 Implications of organisational change

Major macro-level innovations (NHS re-organisation) were contemporaneous with encouraging local innovation. However, local innovation was considered by some as being hampered by macro-level change. Therefore, local innovation may sometimes require macro-level innovations to substantially complete first. These findings are consistent with McMurray’s (2010) finding, including for PCOs, that higher-level change could inhibit local

change (468), and with Ricketts *et al.* (2003), researching mental health services, who found that recent and ongoing change was a barrier to local innovation implementation (312). There are additional parallels with the research by Hunter *et al.* (2014) (469) who found that NHS large-scale change impacted negatively on regional change. Dampening local-level innovation may be seen as dysfunctional in the context of the NHS simultaneously calling for local-level innovation. However, such dampening in a time of change could serve possible latent functions of restricting innovations to those that are somewhat future-proofed, and avoiding wasting resources on projects that later might prove unsuitable. Nonetheless, the capacity of change to provide new opportunities for innovation was recognised by one participant at study 4.

There was perception that the then forthcoming NHS re-organisation could destroy teams, or was already doing so, and that building new teams might be difficult. The researcher cannot confirm actual outcomes for teams post-April 2013. Concern was also raised about how strategies could merge as PCOs were brought together. There was a perceived reduced impetus for innovation because of staff demotivation, particularly with threats of redundancy. These findings were consistent with the NHS Future Forum (2011) (270) observation that some staff “...feared for their own job prospects, others because they feared that their NHS was about to be broken up...” Research based on merging PCOs discovered staff perceptions of uncertainty and vulnerability, and found that centrally-dictated change could weaken local delivery (470). In times of forthcoming undefined change CsDPH may be able to advance certain innovations whereas others may be hindered.

The NHS *Five Year Forward View* (2014) (273) suggests that there is more system change to come, and *Next steps towards primary care co-commissioning* (2014) (274) included the possibility that Clinical Commissioning Groups might have a future role in commissioning dental services. In addition, the King's Fund publication *The NHS under the coalition government. Part one: NHS reform* (2015) (471) indicated that further system change is required, although the authors did not recommend further top-down restructuring. It is probable that ongoing change will create further challenges for the development of local-level innovation.

An additional factor may be a lack of warning of forthcoming large-scale change. Timmins (2012) described how the large scale NHS changes subsequent to the 2012 *Health and Social Care Act* were not expected, because there had been no indication prior to the 2010 general election that such large scale change would occur (106) In addition, after the election the Coalition government published the document (2010) *The Coalition: Our programme for government* (472) where it was stated: “We will stop the top down reorganisations of the NHS that have got in the way of patient care.”

Strategy assumes some predictability. However, during studies 2, 3, and 4, the future NHS arrangements were particularly uncertain. Strategy-making may therefore have ceased or become vague to accommodate unknowns, or have turned out to be a mis-match with future developments, where their usage would have been inappropriate and their prior development a waste of resources. However, one participant in study 2 suggested that a strategy was even more important in times of change.

Participants felt that a reformed NHS could hamper, at least in the short term, or facilitate dissemination, and that a more organised, “*systematic*”, top-down approach to dissemination might develop, perhaps similar to described “*systems*” approaches to innovation (463,473). However, top-down approaches could conflict with how the NHS works (358,359) and the concept of a triple helix (360) between organisations, individuals and innovations (358).

Some felt that re-organisation threatened their implemented innovations, perhaps subsequent to programme review, reduced resources, or changes in the capacity and standards of management and commissioning. A participant suggested loss of scrutiny could result in drift to *laissez-faire* provision of dental public health services. An expectation of greater future local-level political involvement in health policy was considered to have advantages and disadvantages.

Findings suggested perceptions that intellectual property could become more protected in a reformed NHS, threatening knowledge-sharing. Salaman and Asch (2003) suggested that organizational change may moderate employees’ “*psychological contracts*”, possibly affecting commitment, knowledge-development and knowledge-transfer (295 p. 8). Asimakou (2009) emphasised the conditional nature of individuals sharing their own knowledge with organizations (320).

The possibility of inappropriate service design for sections of society was a theme from study 1A. It is not possible at 2015 for the researcher to confirm any improvements post-April 2013 with regard to this, although dental contract reform (275) is likely to lead to changes in service design, but of an unknown nature at the time of writing in 2015.

CHAPTER 14: LIMITATIONS

The purpose of this chapter is to draw attention to limitations not already referred to, or requiring further clarification.

Innovation does not guarantee improvement. Rogers (1995) referred to the possibility of pro-innovation bias in innovation research, leading to excessive support for innovation, and suggested that research focusing on successful innovations supported this bias (302 p. 104-106). Attention to failure or discontinuance in this research attempted to bring balance. However, the researcher notes that interview participants did not generally discuss innovations that they thought had failed, although they did discuss risks and threats.

Validity of interview-based research assumes that knowledge of the personal worlds of participants can be gained and that participants have accurate recall, neither of which the researcher can confirm. Sensitive matters might not have been divulged at interview, possibly affecting emerging themes. Participants' attitudes towards innovation, inequalities, or strategy, may not reflect wider organisational attitudes.

There is a dialectic between the concepts of polysemy and vagueness (277). This research may have made participants focus atypically on the words innovation and strategy. Without such focus participants might not define innovation or strategy in any particular way, but instead harbour vague conceptions.

There is no standardised vocabulary relating to strategy or the stages of innovation. This thesis contains definitions of these terms based on prominent usage. Alternative definitions of innovation, or its stages, could have resulted in differences in methodology, results and conclusions. The researcher accepts that determinants for invention and determinants for adoption of innovations derived from elsewhere may differ (8). Suggestions for further research by Greenhalgh *et al.* (2004) (303) related to health care generally. Although dentistry is part of health care, the researcher cannot confirm that Greenhalgh *et al.* would have recommended the same domains at the more specific dental level.

Dialectics implies opposition, which could be multiple in nature (427,474,475). The researcher considers that contradictions and inconsistencies can be viewed differently by different individuals, and therefore there will be some subjectivity in determining these. In addition, a supposed revelation of functions, latent functions and dysfunctions might not be agreed by readers. Functionalist approaches have been criticised (475). However, the researcher considered it was worth analysing whether inconsistencies, tensions and contradictions served any purpose or whether they were potentially disruptive. A functionalist approach was considered suitable to serve that purpose.

Allocation to structure, process and outcome in Donabedian's model (1,423) is not always straight forward. For example, does an OHS represent a structure or a process? In addition, outcomes could relate to previous structures and processes, and outcomes of current (at the time of this research) structures and processes might not yet be known. The researcher is aware that he has extended the utility of Donabedian's model to a somewhat different setting from its use in assessing quality of health care. This was because the logic of a probabilistic

relationship between structure, process and outcome appeared to remain tenable when assessing how innovation worked in health services.

Although there was no large scale NHS re-organisation while the empirical component of this thesis was being conducted, the researcher cannot confirm that individual PCOs remained constant in terms of management, culture, or other factors during that period. Some of the discussion relates to organizational factors that can be argued to be derived from organisation culture, such as attitudes to risk and new ideas. The researcher acknowledges Schein's (1985) assertion that culture is difficult to uncover because this would require surfacing unconscious assumptions, and therefore makes no claim to have uncovered aspects of organizational culture as defined by Schein (1985) (349 p. 312).

Participation at studies 1A, 2 and 4 was limited by the realities of engaging with individuals who appeared to be very busy, and participation was largely dictated by individuals' availabilities. Some participants were re-interviewed across studies 1A, 2 and 4. Care was taken in the analysis that repetition by individuals did not cause over-representation of particular issues. In studies 1A, 2 and 4, analysis indicated that saturation of data categories had occurred. However, the effect of additional interviews on results and conclusions cannot be known.

Questionnaires or interviews can induce effects caused by the sequence or juxtaposition of statements or questions. Although this cannot be ruled out, there was no evidence that this occurred. Statements in the questionnaire referring to an OHS may have been responded to variably by CsDPH from a PCO with no OHS. There could be response bias in study 4

regarding provision of a facility for sharing innovation-related knowledge, because this possibility was introduced by the researcher. However, participants in study 2 indicated support for such a facility without prompting.

Consistent with other research (476), PCO websites varied in the ease with which information could be found. In addition, some websites had incomplete information. The researcher cannot claim that all extant OHSs were found and cannot account for usage of OHSs un-approved by the PCO board or of out-of-date strategies. It is impossible for the researcher to confirm unwritten strategies or to confirm how any unwritten strategy differed from any written strategy.

Commissioning primary care dentistry has moved away from dependency on UDAs, with PDS Plus agreements issued from November 2009 (466) and the development of contract reform pilots (467) and prototypes (275). Because UDA data used in study 1C were from March 2009, the prevalence of non-UDA commissioning at that time would have been low, and unlikely to affect conclusions. Salaried primary care dentists in Community Dental Services may not have been fully accounted for in UDA commissioning volumes because not all of these had moved to PDS agreements and would have been on block contracts (i.e. no UDAs) when this research was conducted, and for those that moved to PDS it is uncertain whether their UDAs were always reported as commissioned (477). As it has been estimated that these comprise approximately 10% of the primary dental workforce (199) it is considered unlikely that these factors would invalidate conclusions. An alternative would have been to use the total dental allocation for PCOs, but PCOs did not always spend all of their allocation, which also included orthodontics. Failure to spend a dental allocation could

have made a PCO appear under-funded when looking at UDAs commissioned per capita alone; it is possible, for example, that a PCO might have had limited commissioning options. A limitation of using UDAs is recognized in that the amount of “activity” in each UDA can vary. The UDA is used by the NHS as a quantitative measure of courses of treatment, but it does not measure the treatments contained in those courses. Varying availability of private dentistry across PCO areas may have affected commissioning levels.

The d_3mft is based on integers (478). Lorenz curves and Gini coefficients can still, however, display changes in inequality and were therefore considered useful. All secondary data was aggregate data. The argument relating to ecological fallacy (489,490) is accepted in that higher-level aggregate data may mask the diversity that would be seen in lower-level aggregate data. However, PCOs related to populations and aggregation provides relevant population-level data. The accuracy of data obtained from the Department of Health and the ONS could not be verified in this thesis, but it was considered unlikely that inaccuracies would be sufficiently large to invalidate conclusions. The limitations of using compound indices such as IMD (2007) was recognized in that IMD (2007) scores and ranks are not absolute measures of deprivation (479). Study 1C did not analyse data at the level of individual components of the IMD 2007; the researcher notes that Gallagher *et al.* (2009) obtained different results when looking at “*income score*” alone compared to IMD 2004 (480).

Oral health at age five may not reliably predict later oral health (481), although caries at age five has helped predict caries in first molars at age seven (482). These data were used as they were the most recent available at PCO-level and d_3mft of five-year-olds has an advantage of

reducing the impact of extractions and restorations for non-caries reasons. Usage of d₃mft means that caries was being considered at study 1C. Results may have differed if other oral disease or disorders were measured. The d₃mft data are based on surveys requiring positive parental consent, possibly entailing response bias. If the response bias is towards those with less caries then results may underestimate actual caries levels. The metric of d₃mft relates to normative need, which provides no indication of additional components of need such as impact on function and quality of life (247). PCO deprivation data do not account for patient flows from other areas. The precise positioning of the spatial sampling frame, in this case the PCO boundary, could significantly affect aggregate data. For example, an area very close to the boundary might have very different demographics and slight boundary adjustment would change aggregate data. Pearson product moment correlation coefficients indicate the degree of linear correlation. Non-linear correlations will not be properly reflected. Scatter diagrams suggested that there were no strong non-linear correlations. Regression lines are displayed in the results. It is accepted that for poorer correlations the displayed regression lines become less valid as an indication of trend; they are just lines of best fit.

CHAPTER 15: CONCLUSIONS AND RECOMMENDATIONS

Conclusions are mapped onto the research aims, as were the research objectives, so those objectives are not reproduced here. Conclusions that do not align precisely with a particular aim are placed with the aim that is most relevant.

15.1 Conclusions

1. To investigate the role of PCOs in addressing oral health inequality in England.

- PCOs appeared to attach importance to addressing oral health inequality. Variable strategy and innovation would at least partly explain differences between PCOs in addressing oral health inequality. However, meeting targets for access or activity appeared sometimes to be a higher priority than the quality of service provision. Such tensions between the centre and the periphery were most prominent in relation to the OHS.
- OHSs received Board sign-off. However, subsequent Board decisions may have been inconsistent with the OHS because adherence was not mandatory and pressures may have lead to alternative resource allocation. OHSs may have sometimes therefore been only partly implemented. Board appreciation of oral health issues may affect the

likelihood of relevant innovation adoptions. However, at some PCO boards, oral health may not have been a priority.

- Per capita commissioning of primary care dentistry in terms of UDAs did not correlate closely with either deprivation or caries experience, according to the indices used in this study. This might imply that some PCOs were under-funded, had other drivers for commissioning, or were unable to commission all their funding for unknown reasons. Capacity to address oral health priorities might have been unequal, with some PCOs having been inadequately resourced in terms of CDPH advice. Support staff may have sometimes had inadequate experience, and knowledge may have been lost from organisations when staff left. Some PCOs may have had inadequate resources to convert data to useful information. Data may therefore not always have been fully interrogated.
- Addressing oral health inequality might have been restricted by a limited PCO ability to change health-related behaviour. At the time this research was undertaken, the provision of primary care dentistry may have needed to be re-designed, particularly for certain sections of the community.

2. To explore the interaction between strategy and innovation in addressing oral health inequality.

- To a substantial extent strategy may be innovation and innovation may be strategy, a dialectic that may be under-recognised. Much strategy can be viewed as a portfolio of

implemented or intended innovations. This has implications for the extent that we should consider strategy and innovation separately, an approach that is currently prevalent.

- Written strategies can become out-dated within their intended life-span. Adaptation can make actual strategy different to that in documents. A flexible “*implementation plan*” in addition to a strategy may allow adaptation. However, much strategy may not be in formal written strategies, which leads to a position where it is very difficult to externally verify the total amount and range of PCO strategies, or their contents.
- OHSs were not always integrated with other PCO strategies, which may have been developed by separate teams with limited interaction, militating against strategy integration and creating inefficiencies in PCO strategy development and implementation.
- A substantial number of PCOs had no OHS, as defined by the criteria in this thesis. SHA-grouping appeared to affect the likelihood of availability of an OHS, for unclear reasons. Monitoring of PCOs by SHAs with regard to addressing oral health inequality may have been absent. OHSs were sometimes produced only because it was felt to be mandatory, and OHSs were sometimes perceived largely to be a duplication and prone to being ignored, challenging the value of developing additional strategies.

3. To develop an understanding of how innovation aimed at addressing oral health inequality took place in PCOs in England.

- Although many PCOs were perceived by participants to be encouraging and seeking out innovation aimed at addressing oral health inequality, lack of resources sometimes presented a barrier. Additionally, it generally did not appear to be easy for CsDPH to get a PCO decision for innovation adoption or implementation, and there may be no impetus for innovation if “*tried and tested*” methods are working.
- Where there is a partner, innovation implementation is facilitated by good relationships, effective communication, common objectives, and enthusiasm. Key team members may facilitate innovation implementation, because of factors such as problem-solving ability, local knowledge and contacts from past employment.
- Variation between CsDPH in their capacity to connect with innovation sources is likely to affect the types of innovation adopted. Consultants may gain much of their knowledge about other PCOs’ innovations informally.
- Although consultants tended to perceive that their PCO was not too risk averse, there was uncertainty whether individuals would be supported by their PCO if a risk taken, and approved by the PCO, played out adversely.
- Some PCOs might have wanted to see effectiveness demonstrated sooner than the time required for this. Innovations may be threatened by withdrawal of funding before effectiveness can be determined. Should such termination occur, contribution

to evidence bases would be limited, and sunk costs could be wasted. However, innovations may be protected where they are included in PCO strategy or policy documents.

- Ongoing support for innovations can be important post-implementation, but disseminators might not always recognise this.
- The contradictions, tensions and inconsistencies found in this research in relation to the innovation process suggest that there was capacity for innovation in the way innovation took place at PCO-level (meta-innovation).
- Despite calls for local NHS innovation, macro-level NHS innovation or change could hamper local innovation. Some local innovation might require macro-level innovation or change to be completed first, particularly where there is local-level uncertainty. Such uncertainty could have also hampered local strategy-making. The potential negative effect of macro-level innovation or change on local-level innovation and strategy-making may not be fully realised. However, uncertainty might also create windows of opportunity for some innovations. Change is likely to continue, as illustrated by the NHS *Five Year Forward View*. It is probable that an ongoing context of change will create further challenges for the development of innovation and strategy at local-level. The potential for large-scale state health service change to develop in short time-frames presents further possible difficulties.

- Evidence was important in adoption decisions, with concern that insufficiently evidence-based innovation implementations might waste resources. However, some perceived a threat to information-sharing from commercial or intellectual property concerns in a reformed NHS.
- CsDPH perceived limited means for dissemination of innovation nationally, even where they perceived that their innovation could be useful elsewhere. CsDPH also perceived limited means of obtaining innovation-related information from beyond their region. Innovations may disseminate better intra- region than inter-region.
- PCO resources may have been insufficient to develop innovation-related findings for formal contribution to evidence bases. Beyond formal submissions, there was perceived to be limited or no remaining opportunities for innovation-related knowledge to contribute to national evidence bases. An unknown volume of knowledge did not contribute to national evidence bases because it did not leave PCOs. Corresponding evidence bases therefore may not reflect total knowledge. More complete evidence bases might be feasible and could assist innovation gate keeping decisions for bodies such as NICE. The concept of a national repository for sharing innovation-related knowledge was viewed favourably.
- Consultants differed in their interpretation of the words strategy and innovation. The Department of Health and the NHS do not indicate the semantic values that they attach to the words strategy and innovation. Receivers of communications containing these words could therefore assign meanings different to intended meanings.

Subsequent local actions based on differing interpretations may not always match the intention of the centre.

- Applying Donabedian's model (1) of structure, process and outcome to PCO-level strategy and innovation leads to a concern that sub-optimal outcomes might sometimes be expected for both strategy and innovation at PCO-level.
- The link between academia and PCOs may have been sub-optimal in determining whether findings from innovation implementations required further research or could have contributed to research streams or evidence bases. Academic engagement could also assist in deciding whether an innovation at PCO-level should be disseminated. There is a tension between academic standards and the practicalities of meeting these standards where evaluation might be difficult or where projects are small. The periodic publication of epidemiological data could make evaluation of some innovations difficult, because improvements may not be demonstrable without such data.

4. To determine whether there is a role for local-level innovation in addressing oral health inequality.

- Innovation, as defined in this thesis, has a role in reducing inequalities in oral health at the local level. However, PCO innovation was beset by contradictions, tensions and inconsistencies, some of which may have been dysfunctional locally, or for the wider NHS, or both. This may have impacted on the ability of PCOs to meet the QIPP challenge. Continuation of dysfunctions in the reformed health framework

post-April 2013 would be inconsistent with the focus on efficiencies and innovation in the NHS *Five Year Forward View*.

15.2 Recommendations

PCOs were abolished in 2013. Where the local level is referred to, this means the smallest geographical units for dental public health and dental commissioning. At 2015, this landscape was still subject to change.

- Local-level innovation and strategy have roles in addressing oral health inequality, but these need to be adequately resourced. Data-analysis also needs to be adequately resourced.
- The sum of local-level innovation-related knowledge not contributing to national evidence bases is unknown, but could be substantial. Possible means of extracting this knowledge to national evidence bases should be investigated and processes developed to embed this for future local-level innovations.
- Greater local-level academic engagement should be considered to help determine whether innovation-related findings should be researched further, should contribute to existing research streams, or could contribute to an evidence base. Local-level academic engagement could also assist in deciding whether or not to disseminate an innovation. Possible ways of better connecting the local level to academia should be investigated.

- The limited perceived opportunity to share local-level innovation-related knowledge nationally should be corrected. There is an opportunity for macro-level organisations to take a more active role in disseminating successful innovations, possibly by developing a facility for sharing local-level innovation-related knowledge. Incentives should be aligned to support appropriate disseminations.
- The Department of Health, NHS England and Public Health England should work to consistent and overt definitions for “*innovation*” and “*strategy*” so that receivers of communications can assign meanings consistent with centrally intended meanings. This will assist in ensuring that subsequent local-level actions are consistent with central intention.
- The role of post-implementation support for innovations requires emphasis because its importance may not always be fully recognised by disseminators. Disseminating organisations can assist subsequent implementers by making available post-implementation support.
- Because of the perceived threats to the free sharing of knowledge, it would be prudent for the Department of Health, NHS England and Public Health England to build in supports, safeguards and incentives into any framework aimed at facilitating dissemination.

- The informal route of knowledge transfer needs to be taken into account in any national policy or strategy intending to improve dissemination of innovations.
- Implementers should be aware of the importance of good relations and effective communication with partners, and also need to recognise the importance of key team members.
- Attention should be paid to make sure that it is not unduly difficult for CsDPH to get decisions relating to an innovation from an organisation.
- Means of greater local-level strategy integration in the reformed state health service landscape should be investigated, with improved efficiency being an anticipated benefit.
- Withdrawing funding from an implemented innovation before evaluation has been possible should be considered carefully. Loss of potential contributions to evidence bases should be taken into account.
- The potential negative effect of macro-level innovation or change on local-level innovation and strategy-making needs to be recognised. It is recommended that, if local-level innovation and strategy-making continue to be valued centrally, uncertainties in relation to any future macro-level changes are minimised and are of short duration. The potential effect on local-level innovation of ongoing systemic change in the state health service landscape needs to be considered.

- Attention needs to be paid as to whether the right balance is struck between central control and local flexibility so that local-level strategies and innovations can address local needs.
- Consideration should be given to the significant overlap between innovation and strategy. The utility of the concept of an innovation-strategy complex should also be considered.

15.3 Suggestions for further research

The following is a list of areas for possible future research that can be drawn from this study.

- There is potential to investigate for any association between OHSs aimed at reducing inequalities and reductions in such inequalities. Wide variation in OHSs suggests possible enquiry as to whether such variation matters. Similarly, there is potential to investigate for any association between presence of a CDPH at local-level and the addressing of oral health inequalities.
- Analysis of whether strategy integration, between OHS and wider local-level strategies, assists in addressing oral health inequalities, and whether a common risk-factor approach has a role in this assistance.

- The indication that much strategy might lie outside of written documents suggests a possible area of research based around how strategy is constituted at local level.
- Research can be undertaken into whether the concept of a strategy-innovation complex can be developed further.
- Further research to investigate how CsDPH and the local-level NHS synthesise or accommodate contradictions, tensions and inconsistencies.
- The new health and social care landscape offers an opportunity to:
 - Analyse the addressing of oral health inequality at the levels of the NHS England Area Team, Public Health England and Local Authorities.
 - Analyse the interplay between Area Teams (including their LPNs), Public Health England and Local Authorities, in relation to addressing oral health inequality.
 - Analyse how strategy formation and innovation processes operate against the interplay between Area Teams (including their LPNs), Public Health England and Local Authorities, in relation to addressing oral health inequality.
- Following concerns raised in this research, there is an opportunity to research any changes to NHS information-sharing, including the dissemination of innovations.

- There is an opportunity to conduct research into the role of academics at the local-level in order to facilitate extraction of local-level knowledge for the purpose of contributing to national evidence bases. Alternatively, or additionally, research could be undertaken into the role of academia in facilitating dissemination.
- Research can be conducted regarding how successful innovation could be more successfully disseminated nationally, which might include looking at the potential for a central facility for sharing innovation-related knowledge.
- A participant at study 4 indicated that ideas generated at clinical level may be sub-optimally supported for dissemination through the NHS. Research could be conducted to verify this.

APPENDIX1: TOPIC GUIDE FOR STUDY 1A

TOPIC GUIDE

Establish definitional bases

What do participants think that the following mean

- Oral health?
- Access?
- Inequalities in oral health?
- Inequalities in access?

Explore subject importance to PCT

- Determine whether the PCT perceives a need to address oral health inequalities
- Determine whether the PCT perceives a need to address access inequalities

Explore processes to deal with inequalities

- How can the PCT address these problems?
- What changes in individuals/society/personal behaviour do the PCT think they can try to bring about to reduce inequalities in oral health?
- What changes in individuals/society/personal behaviour do the PCT think they can try to bring about to reduce inequalities in access?
- What changes in the provision of services do the PCT think they can try to bring about to reduce inequalities in oral health?
- What changes in the provision of services do the PCT think they can try to bring about to reduce inequalities in access?
- What plans do they have to address inequalities in health and access?
- Is the PCT being externally performance managed over reducing inequalities in oral health?
- Is the PCT being externally performance managed over reducing inequalities in access?

Explore outcomes

- Determine what the PCT expects to derive from their plans
- Establish if PCTs believe the plans are working
- Does the PCT feel they are able to reduce inequalities in health?
- Does the PCT feel they are able to reduce inequalities in access?
- What more would the PCT need in order to achieve its aims?
- Does the PCT feel that there are other barriers in the way?

APPENDIX 2: DISTRIBUTION OF STRATEGIES ACROSS SHAs, WITH NON-ACCESSABLE STRATEGIES REMOVED FROM THE ANALYSIS

Of the fifty five OHSs found, seven could not be accessed for analysis of contents. These are included in the main research as there were board papers that demonstrated that the strategy had been presented to the PCO board and the minutes of the meeting showed that they had been approved and the titles of the documents suggested an OHS. As all similarly titled strategies addressed inequalities in oral health as well as access it was considered unlikely that the seven unviewed documents would not. As a comparison, however, the distribution of OHSs among SHAs was analysed with these PCOs removed. Figure 30 illustrates this analysis.

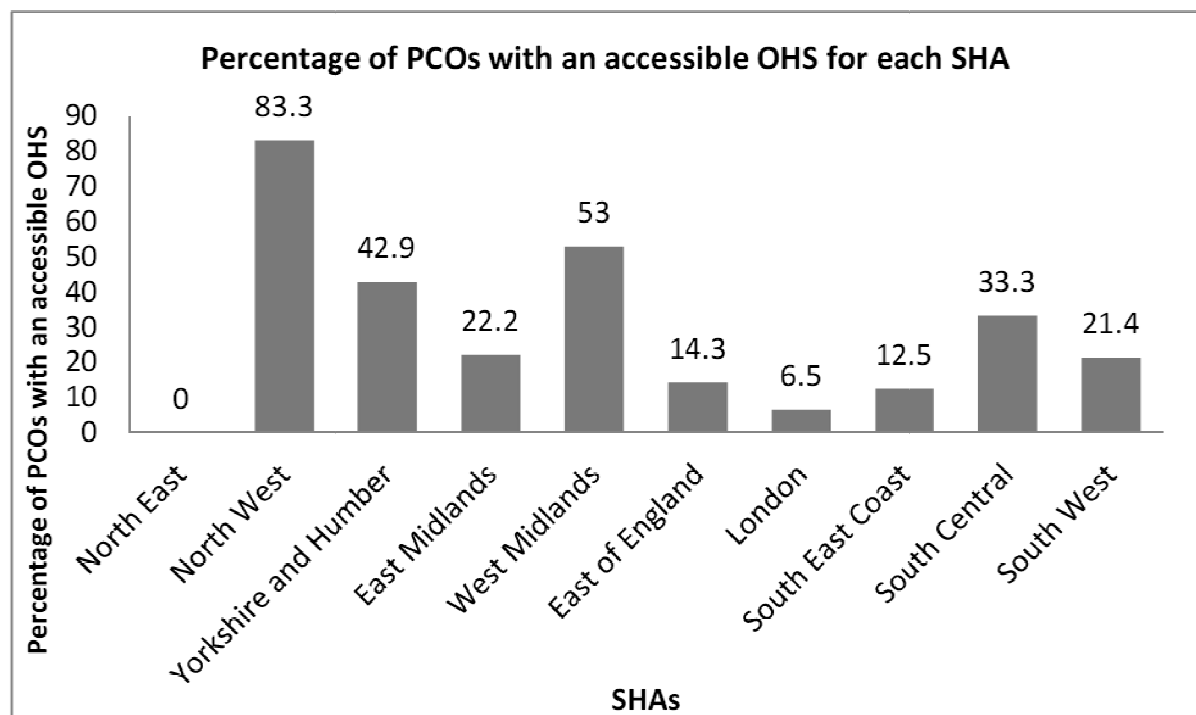


Figure 30. Distribution of OHSs across SHAs with PCOs with non-accessible documents removed.

APPENDIX 3: PCO RANKINGS FOR DEPRIVATION SCORE AND PER CAPITA COMMISSIONING

The Rank of PCOs according to per capita UDAs commissioned as at March 2009, and average IMD (2007) deprivation score rank is presented in the table below.

Table 4. Rankings of per capita commissioned UDAs and ranking of IMD (2007) deprivation for each PCO, with ranking differences

PCO	Rank of per capita UDAs commissioned 1 = most UDAs	Deprivation ranking (IMD 2007) 1 = most deprived		Ranking difference
Ashton, Leigh and Wigan Primary Care Trust	36	54		18
Barking and Dagenham Primary Care Trust	40	21		19
Barnet Primary Care Trust	139	86		53
Barnsley Primary Care Trust	22	37		15
Bassetlaw Primary Care Trust	92	73		19
Bath and North East Somerset Primary Care Trust	94	141		47
Bedfordshire Primary Care Trust	119	139		20
Berkshire East Primary Care Trust	140	137		3
Berkshire West Primary Care Trust	146	145		1
Bexley Care Trust	147	113		34
Birmingham East and North Primary Care Trust	61	10		51
Blackburn and Darwen Teaching Primary Care Trust	18	16		2
Blackpool Primary Care Trust	59	12		47
Bolton Primary Care Trust	80	40		40

Bournemouth and Poole Primary Care Trust	8	94	86
Bradford and Airedale Primary Care Trust	104	28	76
Brent Teaching Primary Care Trust	53	42	11
Brighton and Hove City Primary Care Trust	48	61	13
Bristol Primary Care Trust	44	49	5
Bromley Primary Care Trust	144	127	17
Buckinghamshire Primary Care Trust	149	151	2
Bury Primary Care Trust	37	83	46
Calderdale Primary Care Trust	34	80	46
Cambridgeshire Primary Care Trust	123	140	17
Camden Primary Care Trust	129	44	85
Central and Eastern Cheshire Primary Care Trust	20	132	112
Central Lancashire Primary Care Trust	63	88	25
City and Hackney Teaching Primary Care Trust	145	3	142
Cornwall and Isles of Scilly Primary Care Trust	107	74	33
County Durham Primary Care Trust	85	52	33
Coventry Teaching Primary Care Trust	32	47	15
Croydon Primary Care Trust	105	84	21
Cumbria Primary Care Trust	128	85	43
Darlington Primary Care Trust	65	72	7
Derby City Primary Care Trust	106	56	50
Derbyshire County Primary Care Trust	86	95	9
Devon Primary Care Trust	88	106	18
Doncaster Primary Care Trust	7	35	28
Dorset Primary Care Trust	114	129	15
Dudley Primary Care Trust	74	76	2
Ealing Primary Care Trust	47	64	17
East and North Hertfordshire Primary Care Trust	71	138	67
East Lancashire Primary Care Trust	134	50	84

East Riding of Yorkshire Primary Care Trust	148	130	18
East Sussex Downs and Weald Primary Care Trust	109	120	11
Eastern and Coastal Kent Primary Care Trust	75	92	17
Enfield Primary Care Trust	90	59	31
Gateshead Primary Care Trust	39	41	2
Gloucestershire Primary Care Trust	143	124	19
Great Yarmouth and Waveney Primary Care Trust	3	66	63
Greenwich Teaching Primary Care Trust	23	23	0
Halton and St. Helens Primary Care Trust	31	33	2
Hammersmith and Fulham Primary Care Trust	54	45	9
Hampshire Primary Care Trust	138	147	9
Haringey Teaching Primary Care Trust	11	17	6
Harrow Primary Care Trust	117	118	1
Hartlepool Primary Care Trust	6	22	16
Hastings and Rother Primary Care Trust	46	67	21
Havering Primary Care Trust	131	115	16
Heart of Birmingham Teaching Primary Care Trust	28	1	27
Herefordshire Primary Care Trust	84	105	21
Heywood, Middleton and Rochdale Primary Care Trust	115	24	91
Hillingdon Primary Care Trust	124	99	25
Hounslow Primary Care Trust	52	79	27
Hull Primary Care Trust	2	11	9
Isle of Wight NHS Primary Care Trust	116	89	27
Islington Primary Care Trust	101	8	93
Kensington and Chelsea Primary Care Trust	151	77	74
Kingston Primary Care Trust	137	136	1
Kirklees Primary Care Trust	13	62	49
Knowsley Primary Care Trust	41	6	35

Lambeth Primary Care Trust	56	19	37
Leeds Primary Care Trust	87	65	22
Leicester City Primary Care Trust	51	20	31
Leicestershire County and Rutland Primary Care Trust	82	146	64
Lewisham Primary Care Trust	25	32	7
Lincolnshire Primary Care Trust	111	103	8
Liverpool Primary Care Trust	66	2	64
Luton Teaching Primary Care Trust	78	68	10
Manchester Primary Care Trust	45	5	40
Medway Teaching Primary Care Trust	70	93	23
Mid Essex Primary Care Trust	95	142	47
Middlesbrough County Primary Care Trust	5	9	4
Milton Keynes Primary Care Trust	127	122	5
Newcastle Primary Care Trust	33	30	3
Newham Primary Care Trust	77	7	70
Norfolk Primary Care Trust	55	108	53
North East Essex Primary Care Trust	102	98	4
North East Lincolnshire Care Trust Plus	83	43	40
North Lancashire Primary Care Trust	72	100	28
North Lincolnshire Primary Care Trust	133	82	51
North Somerset Primary Care Trust	50	123	73
North Staffordshire Primary Care Trust	125	101	24
North Tees Primary Care Trust	15	75	60
North Tyneside Primary Care Trust	43	78	35
North Yorkshire and York Primary Care Trust	99	134	35
Northamptonshire Primary Care Trust	112	116	4
Northumberland Care Trust	42	87	45
Nottingham City Primary Care Trust	17	13	4

Nottinghamshire County Primary Care Trust	62	97	35
Oldham Primary Care Trust	49	36	13
Oxfordshire Primary Care Trust	132	144	12
Peterborough Primary Care Trust	29	69	40
Plymouth Teaching Primary Care Trust	120	60	60
Portsmouth City Teaching Primary Care Trust	81	71	10
Redbridge Primary Care Trust	93	89	4
Redcar and Cleveland Primary Care Trust	12	39	27
Richmond and Twickenham Primary Care Trust	152	150	2
Rotherham Primary Care Trust	57	55	2
Salford Teaching Primary Care Trust	27	15	12
Sandwell Primary Care Trust	4	14	10
Sefton Primary Care Trust	26	63	37
Sheffield Primary Care Trust	30	48	18
Shropshire County Primary Care Trust	110	112	2
Solihull Care Trust	136	114	22
Somerset Primary Care Trust	21	117	96
South Birmingham Primary Care Trust	38	34	4
South East Essex Primary Care Trust	103	110	7
South Gloucestershire Primary Care Trust	60	149	89
South Staffordshire Primary Care Trust	97	119	22
South Tyneside Primary Care Trust	1	31	30
South West Essex Primary Care Trust	121	96	25
Southampton City Primary Care Trust	96	70	26
Southwark Primary Care Trust	98	25	73
Stockport Primary Care Trust	16	102	86
Stoke on Trent Primary Care Trust	79	18	61
Suffolk Primary Care Trust	89	131	42
Sunderland Teaching Primary Care Trust	14	29	15

Surrey Primary Care Trust	150	152	2
Sutton and Merton Primary Care Trust	122	128	6
Swindon Primary Care Trust	135	111	24
Tameside and Glossop Primary Care Trust	58	51	7
Telford and Wrekin Primary Care Trust	35	81	46
Torbay Care Trust	69	57	12
Tower Hamlets Primary Care Trust	130	4	126
Trafford Primary Care Trust	68	107	39
Wakefield District Primary Care Trust	19	53	34
Walsall Teaching Primary Care Trust	113	38	75
Waltham Forest Primary Care Trust	91	26	65
Wandsworth Teaching Primary Care Trust	67	91	24
Warrington Primary Care Trust	76	104	28
Warwickshire Primary Care Trust	64	125	61
West Essex Primary Care Trust	108	126	18
West Hertfordshire Primary Care Trust	118	143	25
West Kent Primary Care Trust	141	133	8
West Sussex Primary Care Trust	73	135	62
Western Cheshire Primary Care Trust	10	109	99
Westminster Primary Care Trust	126	58	68
Wiltshire Primary Care Trust	142	148	6
Wirral Primary Care Trust	9	46	37
Wolverhampton City Primary Care Trust	24	27	3
Worcestershire Primary Care Trust	100	121	21

APPENDIX 4: PCO RANKINGS FOR d₃mft AND PER CAPITA COMMISSIONING

Rankings of mean d₃mft in 5-year-olds and per capita commissioned UDAs as at March 2009 for each PCO that participated in the 2007/08 DEP survey are presented in Table 4.

Table 5. Ranking of d₃mft and ranking of per capita commissioned UDAs for each PCO that participated in the 2007/08 DEP survey, with ranking differences.

		rank of per capita UDAs	
	d ₃ mft rank	commissioned	Difference
PCOs. Non-participants in DEP deleted.	1=lowest	1=lowest	in rank
Ashton, Leigh and Wigan Primary Care Trust	114	113	1
Barnet Primary Care Trust	78	13	65
Barnsley Primary Care Trust	108	126	18
Bassetlaw Primary Care Trust	9	58	49
Bath and North East Somerset Primary Care Trust	28	56	28
Bedfordshire Primary Care Trust	33	32	1
Berkshire East Primary Care Trust	100	12	88
Berkshire West Primary Care Trust	59	6	53
Birmingham East and North Primary Care Trust	92	89	3
Blackburn and Darwen Teaching Primary Care Trust	145	130	15
Blackpool Primary Care Trust	107	91	16

Bolton Primary Care Trust	135	70	65
Bournemouth and Poole Primary Care Trust	64	140	76
Bradford and Airedale Primary Care Trust	146	46	100
Brent Teaching Primary Care Trust	147	97	50
Brighton and Hove City Primary Care Trust	2	102	100
Bristol Primary Care Trust	104	106	2
Bromley Primary Care Trust	6	8	2
Buckinghamshire Primary Care Trust	49	4	45
Bury Primary Care Trust	112	112	0
Calderdale Primary Care Trust	125	115	10
Cambridgeshire Primary Care Trust	13	28	15
Camden Primary Care Trust	64	22	42
Central and Eastern Cheshire Primary Care Trust	34	128	94
Central Lancashire Primary Care Trust	111	87	24
City and Hackney Teaching Primary Care Trust	89	7	82
Cornwall and Isles of Scilly Primary Care Trust	86	43	43
County Durham Primary Care Trust	98	65	33
Coventry Teaching Primary Care Trust	62	117	55
Croydon Primary Care Trust	66	45	21
Cumbria Primary Care Trust	93	23	70
Darlington Primary Care Trust	117	85	32
Derby City Primary Care Trust	106	44	62
Derbyshire County Primary Care Trust	37	64	27
Devon Primary Care Trust	59	62	3
Doncaster Primary Care Trust	129	141	12

Dorset Primary Care Trust	51	36	15
Dudley Primary Care Trust	27	76	49
Ealing Primary Care Trust	109	103	6
East and North Hertfordshire Primary Care Trust	20	79	59
East Lancashire Primary Care Trust	126	18	108
East Riding of Yorkshire Primary Care Trust	5	5	0
East Sussex Downs and Weald Primary Care Trust	19	41	22
Eastern and Coastal Kent Primary Care Trust	42	75	33
Enfield Primary Care Trust	51	60	9
Gateshead Primary Care Trust	73	110	37
Gloucestershire Primary Care Trust	20	9	11
Great Yarmouth and Waveney Primary Care Trust	30	145	115
Halton and St. Helens Primary Care Trust	101	118	17
Hammersmith and Fulham Primary Care Trust	135	96	39
Hampshire Primary Care Trust	17	14	3
Haringey Teaching Primary Care Trust	51	137	86
Hartlepool Primary Care Trust	73	142	69
Hastings and Rother Primary Care Trust	80	104	24
Heart of Birmingham Teaching Primary Care Trust	119	121	2
Herefordshire Primary Care Trust	103	66	37
Heywood, Middleton and Rochdale Primary Care Trust	140	35	105
Hillingdon Primary Care Trust	131	27	104
Hounslow Primary Care Trust	82	98	16
Hull Primary Care Trust	130	146	16
Isle of Wight NHS Primary Care Trust	55	34	21

Islington Primary Care Trust	109	49	60
Kensington and Chelsea Primary Care Trust	113	2	111
Kingston Primary Care Trust	44	15	29
Kirklees Primary Care Trust	139	135	4
Knowsley Primary Care Trust	126	109	17
Lambeth Primary Care Trust	83	94	11
Leeds Primary Care Trust	116	63	53
Leicester City Primary Care Trust	143	99	44
Leicestershire County and Rutland Primary Care Trust	62	68	6
Lewisham Primary Care Trust	45	124	79
Lincolnshire Primary Care Trust	28	39	11
Liverpool Primary Care Trust	134	84	50
Luton Teaching Primary Care Trust	138	72	66
Manchester Primary Care Trust	144	105	39
Medway Teaching Primary Care Trust	9	80	71
Mid Essex Primary Care Trust	16	55	39
Middlesbrough County Primary Care Trust	137	143	6
Milton Keynes Primary Care Trust	70	24	46
Newcastle Primary Care Trust	101	116	15
Newham Primary Care Trust	141	73	68
Norfolk Primary Care Trust	46	95	49
North East Essex Primary Care Trust	9	48	39
North East Lincolnshire Care Trust Plus	104	67	37
North Lancashire Primary Care Trust	48	78	30
North Lincolnshire Primary Care Trust	8	19	11

North Somerset Primary Care Trust	37	100	63
North Staffordshire Primary Care Trust	57	26	31
North Tees Primary Care Trust	122	133	11
North Tyneside Primary Care Trust	68	107	39
North Yorkshire and York Primary Care Trust	73	51	22
Northamptonshire Primary Care Trust	55	38	17
Northumberland Care Trust	95	108	13
Nottingham City Primary Care Trust	123	131	8
Nottinghamshire County Primary Care Trust	35	88	53
Oldham Primary Care Trust	141	101	40
Oxfordshire Primary Care Trust	42	20	22
Peterborough Primary Care Trust	115	120	5
Plymouth Teaching Primary Care Trust	51	31	20
Portsmouth City Teaching Primary Care Trust	73	69	4
Redbridge Primary Care Trust	15	57	42
Redcar and Cleveland Primary Care Trust	119	136	17
Richmond and Twickenham Primary Care Trust	9	1	8
Rotherham Primary Care Trust	93	93	0
Salford Teaching Primary Care Trust	132	122	10
Sandwell Primary Care Trust	69	144	75
Sefton Primary Care Trust	70	123	53
Sheffield Primary Care Trust	118	119	1
Shropshire County Primary Care Trust	46	40	6
Solihull Care Trust	23	16	7
Somerset Primary Care Trust	78	127	49

South Birmingham Primary Care Trust	57	111	54
South East Essex Primary Care Trust	37	47	10
South Gloucestershire Primary Care Trust	41	90	49
South Staffordshire Primary Care Trust	3	53	50
South Tyneside Primary Care Trust	99	147	48
South West Essex Primary Care Trust	87	30	57
Southampton City Primary Care Trust	73	54	19
Southwark Primary Care Trust	30	52	22
Stockport Primary Care Trust	84	132	48
Stoke on Trent Primary Care Trust	126	71	55
Suffolk Primary Care Trust	14	61	47
Sunderland Teaching Primary Care Trust	109	134	25
Surrey Primary Care Trust	23	3	20
Sutton and Merton Primary Care Trust	30	29	1
Swindon Primary Care Trust	84	17	67
Tameside and Glossop Primary Care Trust	96	92	4
Telford and Wrekin Primary Care Trust	88	114	26
Torbay Care Trust	72	81	9
Tower Hamlets Primary Care Trust	124	21	103
Trafford Primary Care Trust	91	82	9
Wakefield District Primary Care Trust	97	129	32
Walsall Teaching Primary Care Trust	35	37	2
Waltham Forest Primary Care Trust	90	59	31
Wandsworth Teaching Primary Care Trust	59	83	24
Warrington Primary Care Trust	81	74	7

Warwickshire Primary Care Trust	7	86	79
West Essex Primary Care Trust	40	42	2
West Hertfordshire Primary Care Trust	4	33	29
West Kent Primary Care Trust	1	11	10
West Sussex Primary Care Trust	23	77	54
Western Cheshire Primary Care Trust	26	138	112
Westminster Primary Care Trust	119	25	94
Wiltshire Primary Care Trust	50	10	40
Wirral Primary Care Trust	66	139	73
Wolverhampton City Primary Care Trust	17	125	108
Worcestershire Primary Care Trust	20	50	30

APPENDIX 5: SUPPLEMENTARY FREQUENCY DISTRIBUTIONS

This appendix contains figures to provide further information on the frequency distribution across PCOs of the secondary data-sets. The frequency distributions of differences in PCO rankings are also presented.

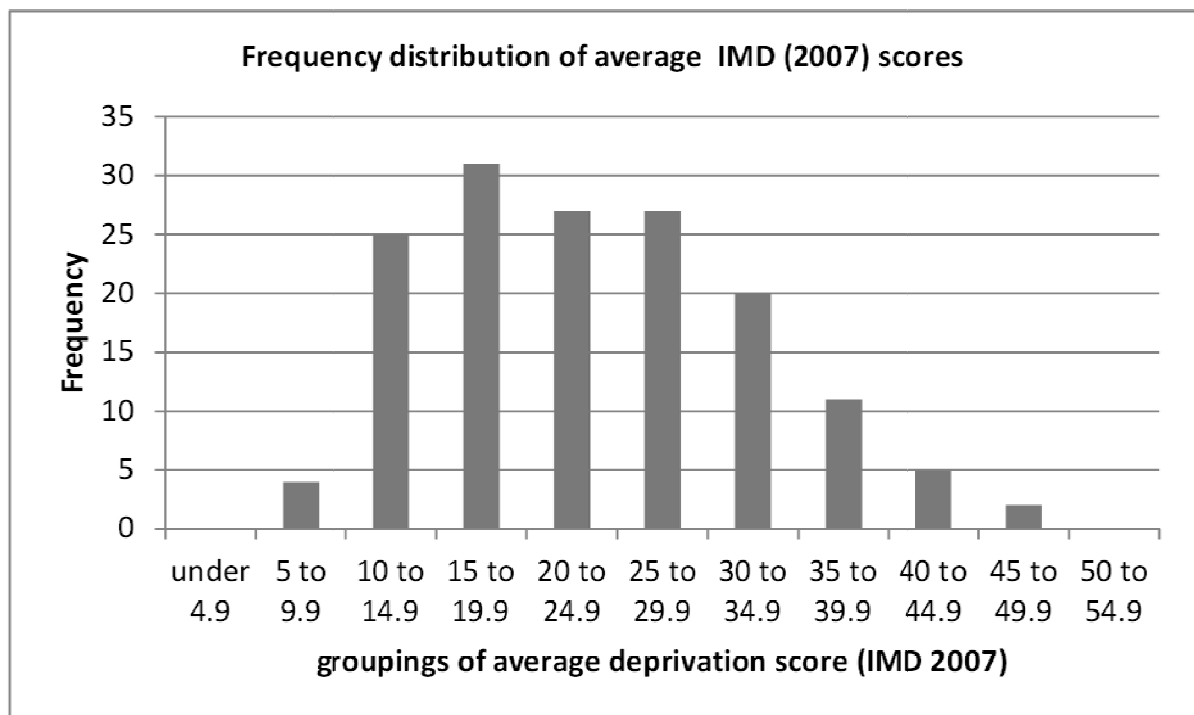


Figure 31. Frequency distribution of average IMD (2007) deprivation scores across all PCOs.

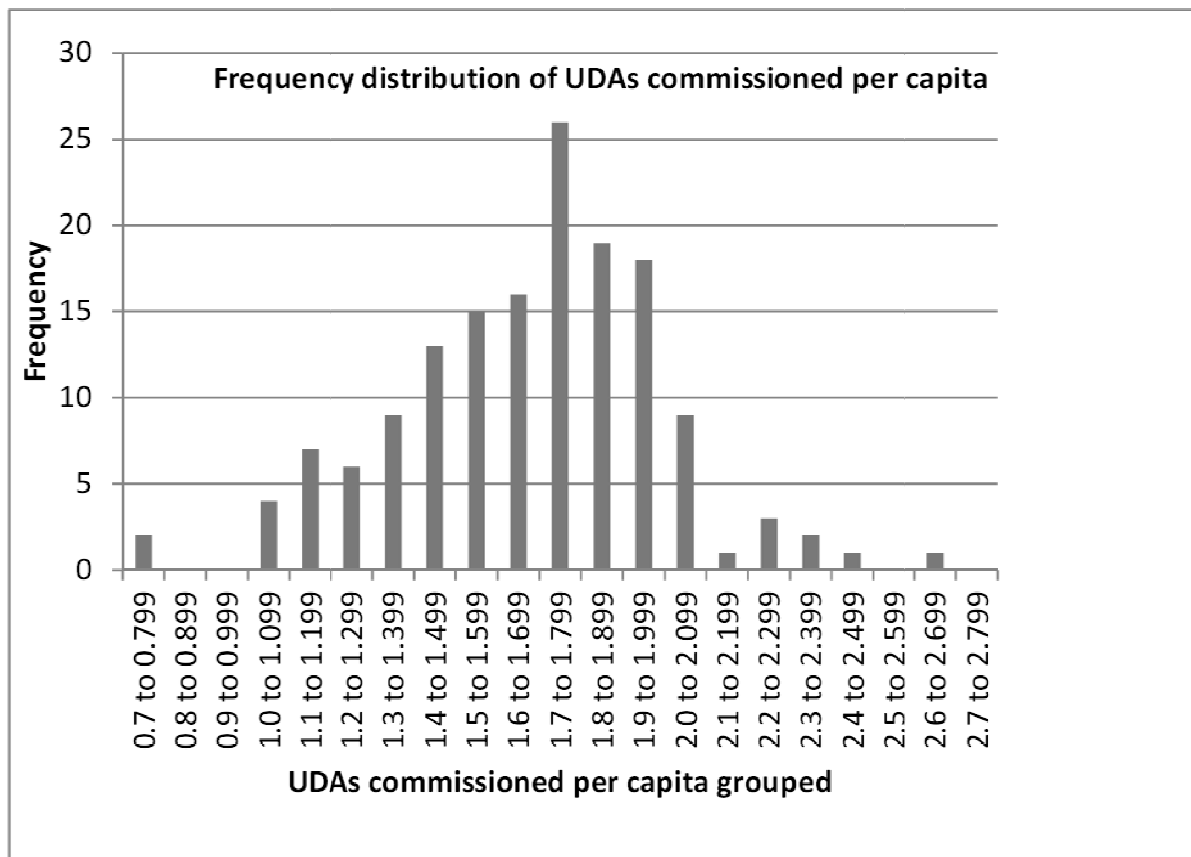


Figure 32. Frequency distribution of UDAs commissioned per capita, as at March 2009, across all PCOs.

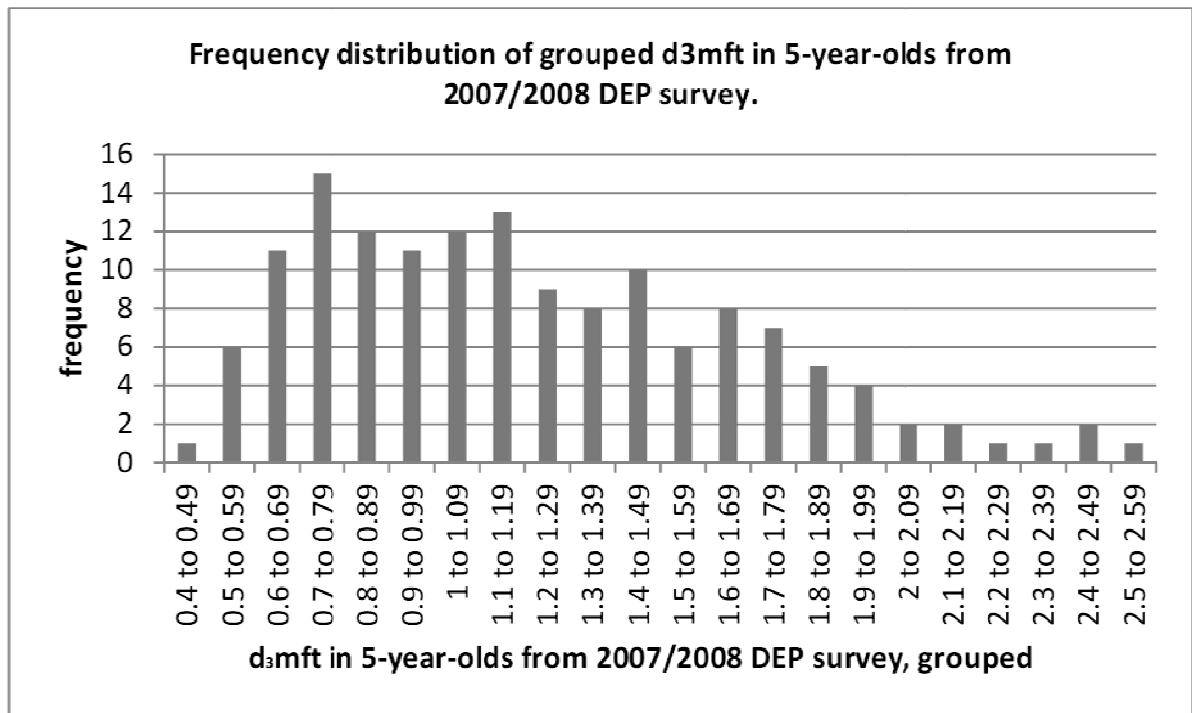


Figure 33. Frequency distribution of d₃mft in 5-year-olds across all PCOs participating in the 2007/2008 Dental Epidemiology Programme.

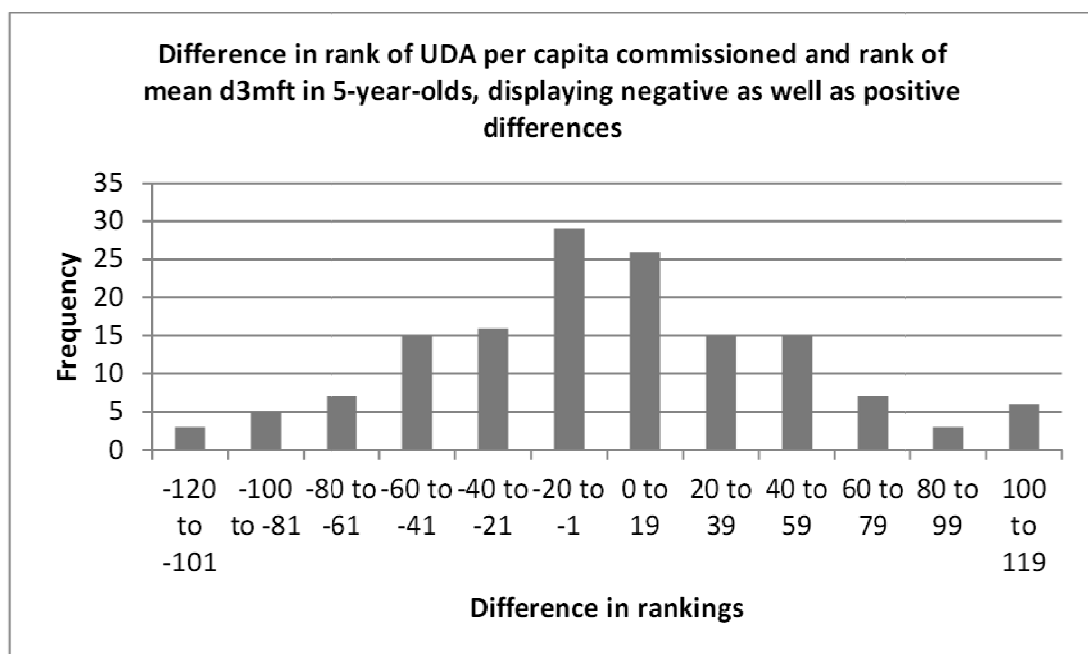


Figure 34. Frequency distribution of difference in rank of UDA per capita commissioned as at March 2009 and rank of mean d₃mft in 5-year-olds, displaying negative as well as positive differences.

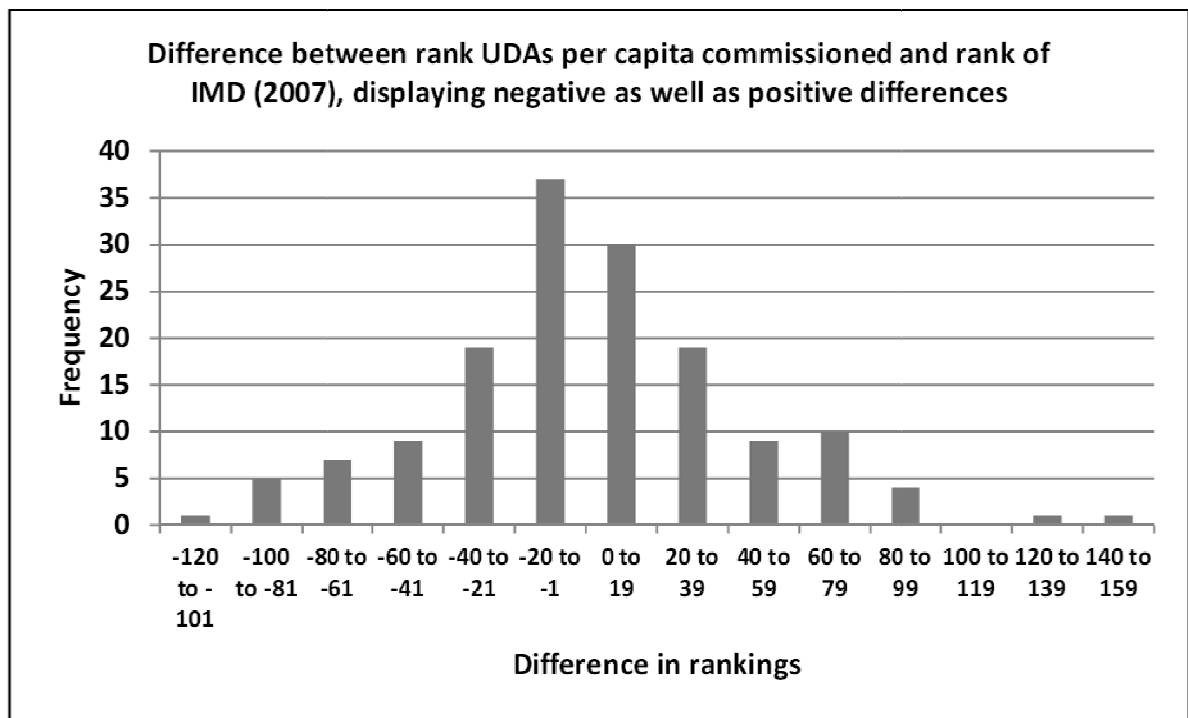


Figure 35. Frequency distribution of difference between rank of UDAs per capita commissioned and rank of average IMD (2007), displaying negative as well as positive differences, for all PCOs.

APPENDIX 6: SUPPLEMENTARY BIVARIATE ANALYSES

This appendix presents the results of the bivariate analysis of secondary data between d₃mft in 5-year-olds and IMD (2007) deprivation, both in actual values and in rankings. Figure 36 shows mean d₃mft in 5-year-olds plotted against average IMD (2007) deprivation score for each PCO that participated in the 2007/2008 DEP survey. The null hypothesis was that mean d₃mft is not related to average IMD (2007) deprivation score. The trend-line is displayed. R^2 was 0.42. Covariance was 2.77 and Pearson product moment coefficient was 0.64. The p-value was <0.05. The null hypothesis was rejected. The PCO most above the regression line was Brent and that most below was Southwark.

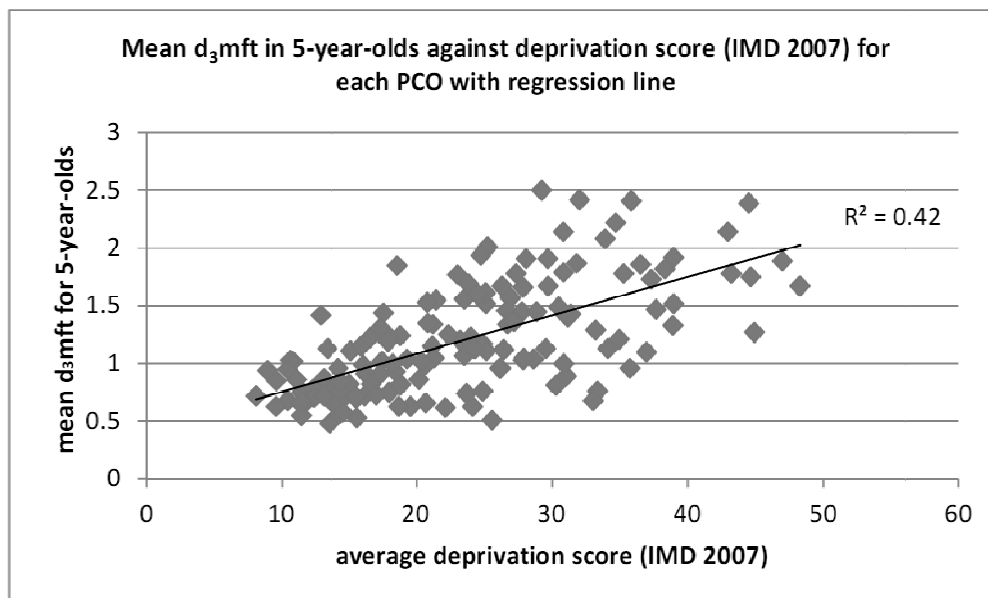


Figure 36. XY scatter diagram for deprivation (IMD2007) against mean d₃mft in 5-year-olds for each PCO participating in the 2007/08 DEP study.

Figure 37 shows average IMD (2007) deprivation score ranking plotted against mean d_3mft for 5-year olds ranking for each PCO that participated in the 2007/2008 DEP survey. The null hypothesis was that rank of mean d_3mft is not related to rank of average IMD (2007) deprivation scores. The range of ranking difference was from zero for Cambridgeshire, County Durham, Croydon, Newham, Wakefield, and Wandsworth PCTs to 106 for Wolverhampton PCT. The mean (\bar{X}) difference in rankings was 27.3 (median: 20). Standard deviation (σ) was 22.4, producing a coefficient of variation (σ/\bar{X}) of 0.819. R^2 was 0.43. P value <0.05 . The null hypothesis was rejected. Observing extremes in either direction, one extreme was Wolverhampton PCT where the deprivation ranking was 106 places higher than the d_3mft ranking. The extreme in the other direction was Berkshire East PCT where the d_3mft ranking was 84 places higher than the deprivation ranking. Spearman's rank-order correlation was 0.658 with 145 degrees of freedom. Analysis of frequency distribution of difference in rankings showed an approach to a normal distribution with a strong central tendency towards zero.

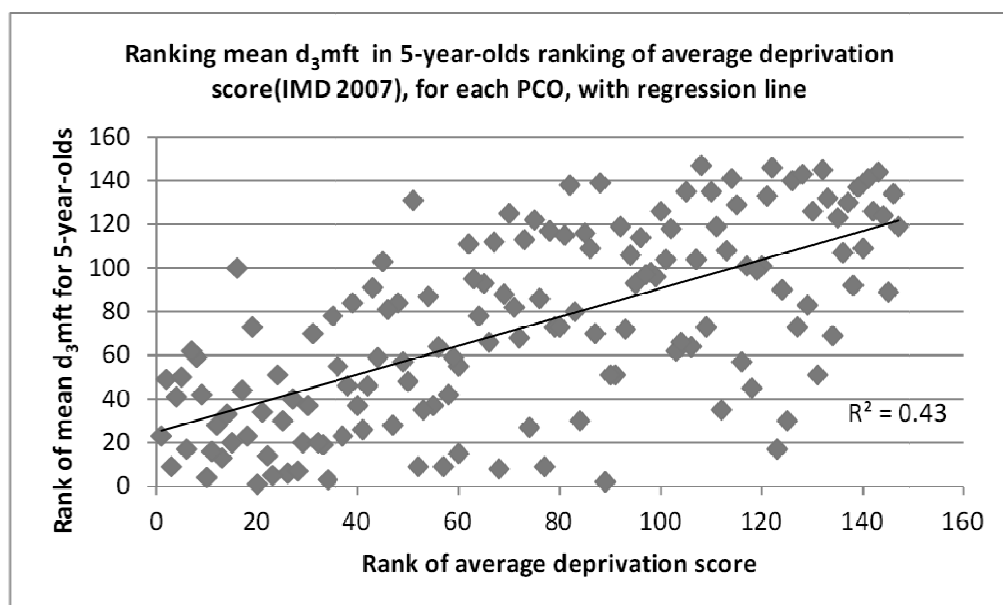


Figure 37. XY scatter diagram for ranking of average deprivation (IMD2007) against mean d_3mft in 5-year-olds ranking for each PCO participating in the 2007/08 DEP study.

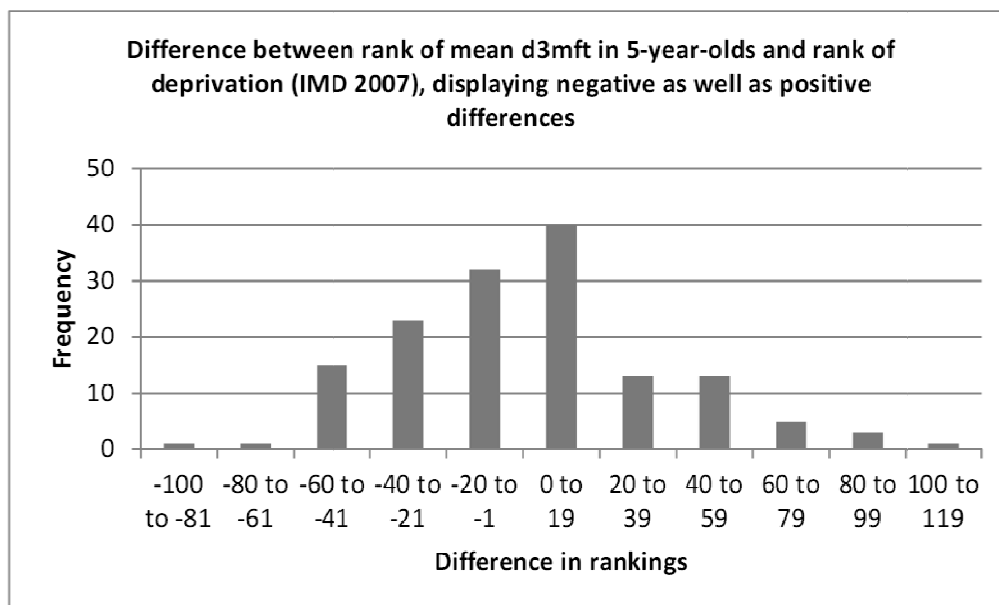


Figure 38. Frequency distribution of difference between rank and mean d₃mft and rank of average deprivation (IMD 2007), displaying negative as well as positive differences, for each PCO taking part in the 2007/2008 DEP survey.

APPENDIX 7: TOPIC GUIDE FOR STUDY 2

TOPIC GUIDE

Strategy

- What do you understand by “strategy?”
- What do you understand by “strategy” to reduce oral health inequalities?
- Does strategy go beyond OHS? (if there is one)
- To what extent is strategy emergent as opposed to *a priori*?
- Does this impact on the relevance of an OHS?
- Who develops the strategy?
 - Single person/team with conflicting roles/team with congruent roles.
- Why this person/this group?
- Do they have sufficient information?
- Are conditions suitably stable/predictable for an *a priori* strategy?
- Does the organizational structure fit with the strategy
- Are there plural outcomes (in addition to reducing inequalities) such as saving money? Which outcome is more important to the organization?
- Who leads the strategy?
- Is there a difference/tension between strategy leaders/implementers and strategy formulators?
- To what extent is strategy locally independent?
 - National requirements
 - Adoption of a strategy formula/template
 - Nobody skilled locally to allow this to be the case.
- Is there a strategic impetus for innovation?

Innovation

- What do you understand by “innovation”?
- What do you understand by “innovation” to reduce oral health inequalities?

- Some examples of innovation (if any)
- Where did these ideas come from?
 - Exogenous – Dentists? Patient groups? Management course? External consultants? PCC? University? Journals?
 - Endogenous- Hierarchy above? PEC? Board? Commissioning staff? Lower grade staff? Consultant Dental Public Health?
 - Is endogenous innovation shared with/promoted horizontally to other bodies?
- What allowed these to become more than just ideas?
 - Local autonomy
 - Opinion leader within organisation
 - Idea was compatible with vision/organisation
 - Cheap
 - Low risk (but we are prepared to take a risk)
 - Lends itself to measurement
 - An informal culture; ideas invited
 - We had the knowledge/skills base
 - Receptive (just the sort of thing we needed)
 - Enough “slack” in organization (money, workforce)
- How did the knowledge of the innovation pass through the organization?
 - Socially
 - Meetings/training
 - Written information
- How did the innovation get out of the organization into the outside world?
 - Socially
 - Meetings/training
 - Written info
 - Use of champions
 - People who can span organizations/cultures (boundary spanners)
 - Change agents
 - Perceived boundary between management and professionals? Overcome?
- Where is the organization on the innovation adoption time-line relative to others?
 - What makes organizations differ on this?
- What were the consequences of the innovation?
 - Desirable versus undesirable
 - Direct versus indirect
 - Anticipated versus unanticipated
- What stopped innovation that had commenced and appeared to be of benefit?
 - Conflict (or anticipated conflict) with central control
 - Finance
 - Disagreement within the organization
 - Exogenous factors: local or national politics; professional disagreement; professional non-acceptance.
 - Out of our depth (inadequate knowledge/skills base)
 - Replaced with a better idea
 - Did other organizations continue with the innovation? Why?
- Are there factors in the organization that inhibit innovation? (attention to the reverse of the factors above that facilitate innovation).

Specific tools/strategies

- New practices
 - Why was this adopted? (Needs' assessment, OHS, local politics?)
 - Has it worked? (People attending. Attending from the target area? Sustainable? Impact on other practices?) How do you know?
- Access contracts (PDS+)
 - Why was this adopted?
 - Has it worked? How do you know?
- Others specific to the organization
 - Why was this adopted?
 - Has it worked? How do you know?

APPENDIX 8: QUESTIONNAIRE

Almost everyone is involved in change and innovation at some point, but people have different experiences and opinions. This questionnaire explores some of the attributes of innovation in strategies to reduce inequalities in oral health by Primary Care Organisations (PCO) in England. Please read through the list and tick the box that most closely matches your opinion.

If you work in more than one PCO, please answer for the one you spend most time with.

If you do not relate to any PCO in England please tick here [] and return the questionnaire.

Please state the (pre clustering) SHA area in which your PCO is located.....

Please state approximately how many years you have been a consultant in dental public health:

(0-5) (5-10) (10-15) (15-20) (20 or more)

Please tick only one box.

The following statements are on “innovation”

	strongly agree	agree	uncertain	disagree	strongly disagree
1. My PCO is always looking for new ways to reduce inequalities in oral health					
2. In my PCO people are given the freedom to apply new solutions to problems					
3. Innovation is encouraged in my PCO					
4. My PCO is too risk averse regarding potential dental public health initiatives					
5. New ideas can come from anywhere in my PCO and be equally well received					
6. My ability to come up with original ideas and ways of doing things is respected by those at the top					
7. It is easy to find information about dental public health initiatives carried out by dental public health colleagues who I do not see regularly for work-related reasons					

	strongly agree	agree	uncertain	disagree	strongly disagree
8. There is a national source that I can go to where knowledge gained from dental public health initiatives in other PCOs is available					
9. There is no suitable place for us to publish findings from our dental public health projects					
10. The information available to me about dental public health initiatives from other PCOs is generally sufficiently evidence-based					
11. I find out about dental public health initiatives in other PCOs mainly through informal contacts					
12. There are sufficient opportunities to informally share knowledge to dental public health colleagues who I don't see regularly for work-related reasons					
13. Does dental public health information sharing happen more within a particular geographic area such as a County, PCO, Cluster, SHA or Sector					
14. We have at least one dental public health initiative that is at risk due to anticipated reductions in funding					
15. Teams that work on dental public health initiatives are being broken up as part of the NHS transformation					
16. The proposed NHS transformation is likely to have a negative impact on developing dental public health initiatives					
17. The proposed NHS transformation has caused a reduction of morale with the people I work with in my PCO					
18. I have as much time as I need for developing new dental public health initiatives in my PCO					
19. I believe that something only qualifies as an innovation if it has never been done anywhere else before					
20. I believe that something that is new to an organisation can be called an innovation, even if it has been used previously elsewhere					
21. Innovation, to me, covers BOTH those things that are new to the organisation, even if used previously elsewhere AND those things never done anywhere else before					

	strongly agree	agree	uncertain	disagree	strongly disagree
22. Getting a PCO decision (approval or rejection) on a new dental public health initiative is easy					
23. We do not generally write up findings from our dental public health initiatives in a way that contributes to the evidence-base					
24. Our new initiatives in dental public health, once up and running, have usually run into difficulties					
25. I will be supported by my PCO if a risk is taken with an initiative that has been approved by the PCO, but where failure results					
26. Dental public health issues are a priority at board (or other approving body) level					
27. Not appearing to lag behind other PCOs has been a motivating factor for adopting initiatives already being undertaken in other PCOs					
28. We generally start new dental public health initiatives because we are under external pressure (e.g. local Department of Health, SHA, media)					
29. I think that when the proposed new NHS structure has settled down it will be easier to introduce new dental public health initiatives than it is now					
30. I think that when the proposed new NHS structure has settled down it will be easier to share information about dental public health initiatives nationally					
31. My PCO sees no benefit in formally writing up findings from new dental public health initiatives					
32. Somebody within my PCO actively looks for new dental public health ideas in other PCOs or elsewhere					
33. The Department of Health structure works well in facilitating the transfer of dental public health knowledge between PCOs nationally					

The following statements are on “strategy”

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree

34. Merging oral health strategies from different PCOs should be, or has been, a straight forward process					
35. We have enough people and money to deliver our oral health strategy					
36. PCO commissioning decisions sometimes take no account of our oral health strategy					
37. Our written oral health strategies generally remain useful over their intended durations					
38. Adapting to change makes actual strategy different to that which is in written documents					
39. It is difficult to be able to plan for dental public health at the moment because of the proposed changes in the NHS					
40. I think that the proposed NHS reorganisation will have no, or a small, impact on our oral health strategy					
41. Our oral health strategy has been distorted away from the needs of our population in order to accommodate national requirements					
	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
42. We do not have the resources in my PCO to convert the raw health data to useful information					
43. Our oral health strategy is integrated with the other strategies that my PCO has					

Thank you for completing this questionnaire

Please use this space to provide any further comments

APPENDIX 9: ACCOMPANYING LETTER FOR QUESTIONNAIRE (1ST MAILING)



UNIVERSITY OF
BIRMINGHAM

College of Medical and
Dental Sciences
School of Dentistry

12/3/2012

Dear

I am undertaking doctoral research in Dental Public Health at the School of Dentistry at the University of Birmingham. My thesis topics are innovation in Primary Care Organisations and inequalities in oral health.

I would be most grateful if you would spare some of your valuable time in completing the attached questionnaire, which is being distributed to all Consultants in Dental Public Health in England. The questionnaire should take approximately ten minutes to complete. I'd like to assure you that all data will be anonymised and non-attributable. You will note that there is a code on the form. This is to allow us to send out a second mailing to non-responders.

I thank you very much in anticipation of your contribution to this research. Please note that there is a form enclosed that allows you to request feedback from this research. This will be separated from the questionnaire in order to preserve anonymity.

I would be grateful if you would return your completed questionnaire in the enclosed pre-paid envelope by the end of March 2012.

Yours Sincerely,

APPENDIX 10: ACCOMPANYING LETTER FOR QUESTIONNAIRE (2ND MAILING)

Dear

We wrote to you a short while ago asking for your help with important research that is being carried out by the University of Birmingham's School of Dentistry. My thesis topics are innovation in Primary Care Organisations and inequalities in oral health.

Unfortunately, we have not received your completed questionnaire. However, the research team at the University still values your opinions on these topics and would be grateful if you would complete the enclosed questionnaire.

To this end, we are sending you another copy of the questionnaire. The questionnaire consists mainly of tick box responses, and should take a maximum of 10 minutes to complete. If you have already returned your questionnaire in the meantime, we would like to thank you for your assistance.

Please would you return the completed questionnaire to the School of Dentistry by the **end of April 2012 in the prepaid envelope provided.**

Thanking you in advance for your help.

Yours sincerely, Paul Kelly

APPENDIX 11: ACCOMPANYING LETTER FOR QUESTIONNAIRE (3RD MAILING)

Dear

We wrote to you a short while ago asking for your help with important research that is being carried out by the University of Birmingham's School of Dentistry. My thesis topics are innovation in Primary Care Organisations and inequalities in oral health.

Unfortunately, we have not received your completed questionnaire. However, the research team at the University still values your opinions on these topics and would be grateful if you would complete the enclosed questionnaire.

To this end, we are sending you another copy of the questionnaire. The questionnaire consists mainly of tick box responses, and should take a maximum of 10 minutes to complete. If you have already returned your questionnaire in the meantime, we would like to thank you for your assistance.

Please would you return the completed questionnaire to the School of Dentistry by the **end of May 2012 in the prepaid envelope provided.**

Thanking you in advance for your help.

Yours sincerely

APPENDIX 12: RESULTS OF QUESTIONNAIRE

Table 6. Results of questionnaire

	strongly agree	agree	uncertain	disagree	strongly disagree	n
1. My PCO is always looking for new ways to reduce inequalities in oral health	6	20	2	5		33
2. In my PCO people are given the freedom to apply new solutions to problems	3	28		1	1	33
3. Innovation is encouraged in my PCO	7	23	2	1		33
4. My PCO is too risk averse regarding potential dental public health initiatives		5	3	22	1	31
5. New ideas can come from anywhere in my PCO and be equally well received	4	20	5	4		33
6. My ability to come up with original ideas and ways of doing things is respected by those at the top	7	18	6	1		32
7. It is easy to find information about dental public health initiatives carried out by dental public health colleagues who I do not see regularly for work-related reasons	1	10	6	12	2	31
8. There is a national source that I can go to where knowledge gained from dental public health initiatives in other PCOs is available		3	5	21	3	32
9. There is no suitable place for us to publish findings from our dental public health projects	1	7	6	16	1	31
10. The information available to me about dental public health initiatives from other PCOs is generally sufficiently evidence-based		6	14	9	1	30
11. I find out about dental public health initiatives in other PCOs mainly through informal contacts	3	25	1	2		31
12. There are sufficient opportunities to informally share knowledge to dental public health colleagues who I don't see regularly for work-related reasons	1	9	5	16	1	32
13. Does dental public health information sharing happen more within a particular geographic area such as a County, PCO, Cluster, SHA or Sector	6	16	4	1	1	28
14. We have at least one dental public health initiative that is at risk due to anticipated reductions in funding	7	12	1	11		31

15. Teams that work on dental public health initiatives are being broken up as part of the NHS transformation	8	11	3	10		32
16. The proposed NHS transformation is likely to have a negative impact on developing dental public health initiatives	8	8	12	3		31
17. The proposed NHS transformation has caused a reduction of morale with the people I work with in my PCO	16	13	2			31
18. I have as much time as I need for developing new dental public health initiatives in my PCO		6	3	14	8	31
19. I believe that something only qualifies as an innovation if it has never been done anywhere else before	2	3	4	21	1	31
20. I believe that something that is new to an organisation can be called an innovation, even if it has been used previously elsewhere	1	19	4	5	2	31
21. Innovation, to me, covers BOTH those things that are new to the organisation, even if used previously elsewhere AND those things never done anywhere else before	3	18	4	4	1	30
22. Getting a PCO decision (approval or rejection) on a new dental public health initiative is easy		6	3	19	2	30
23. We do not generally write up findings from our dental public health initiatives in a way that contributes to the evidence-base	5	21		2	2	30
24. Our new initiatives in dental public health, once up and running, have usually run into difficulties		5	10	16	1	32
25. I will be supported by my PCO if a risk is taken with an initiative that has been approved by the PCO, but where failure results		14	15	3		32
26. Dental public health issues are a priority at board (or other approving body) level		13	4	14	1	32
27. Not appearing to lag behind other PCOs has been a motivating factor for adopting initiatives already being undertaken in other PCOs		10	7	12	2	31
28. We generally start new dental public health initiatives because we are under external pressure (e.g. local Department of Health, SHA, media)	1	4	6	17	4	32

29. I think that when the proposed new NHS structure has settled down it will be easier to introduce new dental public health initiatives than it is now	1	4	12	11	4	32
30. I think that when the proposed new NHS structure has settled down it will be easier to share information about dental public health initiatives nationally	1	12	13	5	1	32
31. My PCO sees no benefit in formally writing up findings from new dental public health initiatives		6	11	13	3	33
32. Somebody within my PCO actively looks for new dental public health ideas in other PCOs or elsewhere	2	10	4	14	3	33
33. The Department of Health structure works well in facilitating the transfer of dental public health knowledge between PCOs nationally			13	15	5	33
The following statements are on “strategy”						
	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	
34. Merging oral health strategies from different PCOs should be, or has been, a straight forward process	1	14	6	10	2	33
35. We have enough people and money to deliver our oral health strategy		5	3	15	9	32
36. PCO commissioning decisions sometimes take no account of our oral health strategy	6	13	3	11		33
37. Our written oral health strategies generally remain useful over their intended durations	3	15	7	8		33
38. Adapting to change makes actual strategy different to that which is in written documents	2	21	2	7		32
39. It is difficult to be able to plan for dental public health at the moment because of the proposed changes in the NHS	8	17	3	3		31
40. I think that the proposed NHS reorganisation will have no, or a small, impact on our oral health strategy	1	6	9	11	6	33
41. Our oral health strategy has been distorted away from the needs of our population in order to accommodate national requirements	2	5	4	21	1	33
	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	

42. We do not have the resources in my PCO to convert the raw health data to useful information	2	11	1	17	1	32
43. Our oral health strategy is integrated with the other strategies that my PCO has	1	13	8	8		30

APPENDIX 13: DIALECTICAL AND FUNCTIONAL ANALYSES

Table 7. Dialectical and functional analyses at individual, local and macro-levels.

Thesis	Antithesis	Possible synthesis/accommodation	Functionalist issues deriving from possible syntheses/accommodation
INDIVIDUAL			
Consultants vary in what they understand by the term “innovation”.	In NHS or Department of Health literature the term “innovation” is not usually qualified by any definition.	Consultants use their own differing interpretations of the word innovation to make sense out of this term when it is used.	Functional (anticipated): ambiguity allows flexibility Dysfunction: confusion; anticipated results do not occur (e.g. innovation just equated with invention).
Consultants vary in what they understand by the term “strategy”.	In NHS or Department of Health literature the term “strategy” is not usually qualified by any definition.	Consultants use their own differing interpretations of the word innovation to make sense out of this term when it is used.	Functional (anticipated): ambiguity allows flexibility Dysfunction: confusion; local level strategy inconsistent with central intention (if there was one).
A separate OHS for each PCO was considered desirable centrally.	Some CsDPH felt this may be inefficient as they may be duplicatory or ignored.	Some OHSs may have been produced in order to meet central expectation, despite risk that they may be duplicatory or unread.	Dysfunction: Relatively pointless production to satisfy the center – inefficient.

Adoptions appear to be assisted by the CDPH being in direct contact (possibly informal) with an innovation source.	Opportunities across CsDPH to connect with each individual source will be unequal.	the volume and types of adoptions will be moderated by the opportunities CsDPH have to connect with innovation sources.	Risk of dysfunction: An individual's "contacts" may not have the best innovations Possible latent: Allows dissemination to occur without a formal framework.
CsDPH are aware of taking into account national guidance when developing an OHS.	Part of the responsibility of a CDPH is to account for local factors in developing the OHS.	CsDPH have to strike a balance between national guidance and local factors, which could entail compromising an ability to accommodate local factors.	Functional (anticipated): Limits loss of central control Dysfunction: possible excessive skewing of OHS away from local factors.
A CDPH looking beyond their PCO for new ideas may increase access to potential adoptions.	It may sometimes be nobody's formal job to look actively beyond the PCO for potential adoptions.	Exploration beyond the PCO may sometimes be moderated by intrinsic motivation.	Dysfunction: innovation not looked for although called for centrally.
The informal route is considered important in learning about new ideas.	There may be inadequate opportunity to use this route at a national level.	Informal innovation-related knowledge-sharing may occur more at sub-national than national level.	Dysfunction: Informal innovation-related knowledge-sharing may be irrationally bounded.
LOCAL-LEVEL			
Senior-level PCO understanding of oral health issues can facilitate relevant implementation.	Senior-level PCO understanding of oral health issues may sometimes be limited, which can hinder relevant implementations.	Decision to implement relevant innovation may be moderated by nationally variable Board understanding of oral health issues.	Dysfunction: Innovations of equal merit (or, even, the same innovation) could be implemented differentially in different locations.
Professional advice to the commissioning function, as might be supplied by CsDPH, was considered desirable.	CsDPH were not available to all PCOs.	Some PCOs had to operate without CDPH advice.	Dysfunction: Some PCOs did not benefit from CDPH advice, while some did, without any evidence that those without needed it less.
OHSs imply available resources for implementation.	Resources may be inadequate to implement the OHS.	OHSs may not be fully or adequately implemented. Prioritisation might be required.	Dysfunction: Undeliverable OHSs and wasted resources in their creation.

PCO time-frames.	Time required before an implementation can be evaluated.	Some innovations could have resources withdrawn because benefits cannot be demonstrated soon enough, or implementations might not take place.	Dysfunction: wasted resources prior to termination. No contribution to evidence base. Innovations not fitting PCO time-frame may be excluded.
A reasonable expectation of a public service is that it will address the needs of a society.	Service design for some sections of society may not have been appropriate.	Some of society may have sub-optimally engaged with dental services.	Dysfunction: the service does not meet the needs of all.
Commissioning per capita levels might be expected to reflect oral health need.	There was little such correlation.	If need had been converted to demand, some PCO areas might have been subject to under-commissioning.	Possible dysfunction: the NHS may not have always been providing services in accordance with need. However, need may not have converted to demand.
New service provision may have been based on need.	Demand may not have matched need.	Uptake of such services may have been lower than anticipated.	Dysfunction: possible poor use of resources.
Intra- PCO knowledge transfer between individuals is desirable when staff leave.	Some knowledge is tacit and departs with an individual.	When some people leave they may take important knowledge with them that has not, or cannot be, written down.	Dysfunction: knowledge that is desirable to retain is lost.
Availability of usable information requires workforce to derive this from data.	There may be no specialised workforce to do this and the CDPH may not be resourced to do this.	Information was derived from data according to variable available resources.	Dysfunction: in some PCOs data may not have been fully interrogated.
OHSs were developed with board sign-off and therefore aspects of the strategy can be expected to be reflected in board decisions.	There was no obligation for board decisions to reflect the OHS.	OHS implementation may have depended on board decisions, which may have been inconsistent with the OHS.	Dysfunction: OHS (or part of them) implementation may be blocked by the same board that approved the OHS. Function: Board prioritisation across a range of services.
It was required that PCOs had a written OHS.	Owing to change, written strategies can become out of date.	Actual strategy could diverge from the OHS.	Functional: Out of date OHSs not relied upon.
It was required that PCOs had a written OHS.	This research found OHSs (fulfilling the acceptance criteria) from just over 1/3rd of PCOs.	PCOs may have operated without an OHS.	Possible dysfunction: Some PCOs may have had no plans. However, strategy may have taken another form (e.g. emergent) or PCO may have perceived non-utility of OHS.

PCOs could have integrated their various strategies, including the OHS.	Strategies may have been developed separately by individuals/teams with limited interaction.	Some PCOs may have had over-lapping or conflicting strategies.	Dysfunction: Duplication, contra-diction, inefficiency.
OHSs may have been needed more in PCO geographies of higher deprivation, given the associations between oral health and deprivation.	OHS (fulfilling the acceptance criteria) availability did not appear to be related to deprivation.	Some PCOs with more deprived populations did not have an OHS(fulfilling the acceptance criteria).	Possible dysfunction: No strategy in areas where oral health problems were greater. However, strategy could have taken a different form (e.g. emergent).
Guidance suggested that OHSs needed to take into account a wide range of stakeholder views.	A wide range of stakeholder involvement increases the possibility of conflict.	OHSs may have certain aspects that some consider important excluded owing to a desire for wide “ownership”.	Functional: “ownership” may be necessary for implementation. Possible dysfunction: Exclusion or inclusion could become a political process more than evidence-based.
Post-implementation support may be important for an innovation.	Post-implementation support implies resources. Importance of support may not be recognised.	Post-implementation support may be provided consistent with resources and the degree of recognition of the importance of support.	Dysfunction: Required support may not be provided because of lack of resources or lack of recognition of its importance.
Evaluation of innovations is seen as beneficial	Where this relies on epidemiological data, these data are periodic	Some innovation may not take place, knowing potential difficulties in evaluation	Functional: Not implementing innovations that cannot be evaluated.
Innovation is a way of addressing change and improving services.	Innovation implies risk as not all innovations will work.	A balance must be struck between risk and potential benefit.	Functional: Balancing risk and benefit would be a rational endeavour.
Innovation implementation implies resources.	Resources may be inadequate.	Where implementation is inconsistent with resources, innovations may be implemented partially, compromises made or not implemented at all.	Possible latent function: Protects resources in a publically funded service Possible dysfunction: Beneficial innovations (for which the NHS is calling) may not be implemented.
Local innovation is called for by the centre.	The bureaucratic nature of PCOs can hinder innovation.	Innovation occurs to an extent consistent with PCO bureaucracy.	Beneficial innovations (for which the NHS is calling) may not be implemented.

Innovation implementation may involve working with a partner organisation	Joint working could engender tensions deriving from different cultures, work practices and attitudes to oral health.	Successful implementation may rely to an extent on addressing these problems where they exist	Possible latent function: bureaucracy allows for a control mechanism that does not allow innovation to run wild. Dysfunction: NHS may not benefit (for beneficial innovations) from innovation, for which it is calling
PCOs are assisted by having teams that work well.	Changes were perceived to be breaking teams up.	Some PCOs had to function with new or smaller teams.	Functional: Was required for the change. Possible dysfunction: Projects, strategy etc. may have become disrupted or under-resourced.
PCOs strategised on the basis that the future has some predictability.	The future against which PCOs may wish to strategise was not predictable.	Therefore, strategy-making may cease or becomes vague in an attempt to accommodate future unknowns, or turn out to mis-match the future.	Possible dysfunctions: Reduced or no strategy; future strategies wrong; need to keep re-developing strategy.
Forthcoming change of an uncertain nature can discourage the adoption of innovations.	Such change can improve the chances of some adoptions through windows of opportunity.	In times of such changes certain innovations could be advanced while others could be hindered.	Possible latent function: non future- proofed innovations may be filtered out.
Major innovation (NHS re-organisation) at the macro-level was implemented against a background of encouraging innovation in the NHS generally.	Innovation at PCO-level was considered by some to be hampered by the macro-level innovations.	Despite calls for local-level innovation, macro-level innovations appeared to sometimes hamper this. Local innovation may require national innovation to complete first.	Dysfunction: local innovation called for centrally may not occur. Latent function: Dampens innovations that may not match the future.
MACRO-LEVEL			
There may be an expectation that central bodies should have a significant role in dissemination of innovations originating at PCO-level.	This does not appear to substantially occur.	Central bodies do not meet the expectations of some in dissemination of innovations originating at PCO-level.	Possible dysfunction: Sometimes, the system has potential for upwards push of innovation from local-level, but there may be no receiving or disseminating function at the centre.
Local-level innovations should be evaluated in order to contribute to evidence bases.	There may be inadequate resources for formal publication, and no perceived other platform to publish to.	Knowledge may remain geographically-bounded, not contributing to evidence bases, which therefore may not reflect total knowledge.	Dysfunction: Evidence bases did not reflect the global sum of knowledge held at PCO-levels.

Evidence base is a factor in deciding whether to adopt an innovation.	There may be no, or an inadequate evidence base.	PCOs may have to make a decision based on available information, which might be less than ideal.	Functional: Screens out innovations with no evidence base. Possible dysfunction: Risks could be taken that cannot be estimated
Consultants may use the informal route to find out about innovations.	Information supplied informally may not come with a formal evidence base.	Access to an evidence base to support knowledge gained informally may be attempted, with possible variable success.	Functional: Screens out innovations with no evidence base. Possible dysfunction: Risks could be taken that cannot be estimated where no supporting evidence base found.

APPENDIX 14: LETTER REQUESTING PARTICIPATION IN INTERVIEWS

Dear Participant,

I am most grateful for your past assistance in providing me with an interview as part of my PhD research into the area of innovation by Primary Care Organisations to help address inequalities in oral health. My PhD research is based at the School of Dentistry, University of Birmingham, and my supervisors are Deborah White, John Morris and Kirsty Hill. My PhD research has progressed and I would now like to ask if you could spare an hour or less of your valuable time in order for me to interview you about any specific cases of innovation by a Primary Care Organisation that you may have been involved with. Please note that for the purposes of my research, innovation includes things that are new to your PCO even if they had been done previously elsewhere. You would be provided with an outline of the topic guide prior to the interview.

I would be very grateful if you would allow me to briefly impose on your time in order to advance my research into this area of oral health inequalities.

Regards,

Paul Kelly

PhD researcher, The Dental School, University of Birmingham

APPENDIX 15: TOPIC GUIDE FOR STUDY 4

TOPIC GUIDE

Inform participant

- Consent and being recorded.
- Funded by myself and the University of Birmingham.
- My definition of innovation – includes new to the location, even if done elsewhere, and invention.

Do you have an innovation that you think would help others in your field?

What was done?

What was the innovation(s) in this?

Where did it come from or did you invent it?

Was it successfully implemented? If not, why not?

Was it fully or partly implemented? If partly, why?

What was it meant to achieve?

Did it achieve this?

Do you think this innovation is transferable elsewhere?

Do you think it would be of use elsewhere?

Currently, how might you disseminate your innovation?

Have you already disseminated your innovation?

- If yes, how?
- If no, do you have plans, and how might you do it?

What might help facilitate dissemination of this innovation?

Would a central repository where you could deposit knowledge about your innovation, so that others could see this, help?

- If yes, how would you like it to look?

Would you find such a repository useful for obtaining ideas for your area?

APPENDIX 16: SUPPLEMENTARY MATERIAL RELATING TO THE PROPOSAL TO BASCD

This appendix includes results derived from study 4.

The proposal was engendered by the BASCD's circulation of *Dental Public Health in Action. Guidelines for Authors* (see Appendix 17), the objectives of which included sharing of knowledge and experience between dental public health practitioners. These objectives appeared consistent with findings emerging from this thesis suggesting that greater innovation-related information-sharing might be required. The researcher approached the BASCD and offered, as part of this thesis, his assistance in developing a web-based facility, which would be aimed at meeting many of the objectives laid out in *Dental Public Health in Action. Guidelines for Authors*. The researcher became aware of the circulation in August 2012. The copy provided to the researcher carried no date but subsequent communication with BASCD indicated that this would have been shortly prior to August 2012.

The initial enquiry (see Appendix 18) was welcomed verbally and by email and the researcher was invited to submit a proposal to the BASCD, which was submitted in October 2012 (see Appendix 19). The BASCD requested more detail regarding certain aspects of the proposal including how the facility might integrate with the BASCD website. A second proposal was therefore sent to the BASCD, also in October 2012 (see Appendix 20).

Communications received by the researcher from the BASCD are not included in this thesis because the authors had not been told of the possibility of such inclusion.

The researcher was later told verbally that the matter had been discussed at the BASCD, but the researcher did not obtain any invitation to proceed. In December 2012 the researcher communicated with the BASCD (see Appendix 21) in an attempt to determine whether a decision had been made. At February 2013 the researcher communicated with the BASCD (see Appendix 21) to inform them that there was now insufficient time to set up the proposed facility prior to when the researcher anticipated that he would be commencing the writing-up of this thesis.

In informal discussion with the BASCD members in November 2012 the researcher perceived a possible concern by some members that my proposal overlapped significantly with the function of the National Electronic Library for Health (NeLH). On requesting more information, the researcher was forwarded to an individual who had been involved in the NeLH, and an informal telephone conversation took place in January 2013. Details are not provided as information may have been provided in confidence. However, following this, the researcher perceived there to be no great overlap between the proposal and the activities of the NeLH. The function of the NeLH is now performed by the NHS Evidence Search facility.

The reasons why the BASCD did not accept or adapt the proposal are unknown to the researcher. Perhaps the researcher was too unknown to trust to deliver the project, or perhaps the BASCD wished the information-sharing facility to remain as part of their journal. The

BASCD may have perceived sufficient risk of failure, perhaps because of under-use. Perhaps the BASCD had concerns over who would run the project long term, or perhaps there were concerns over moderating contributions. Initial and ongoing costs were unknown to the researcher, and these may have been a concern, as may have been any conflict with other projects.

Results from study 4 relating to practicalities of developing a hub:

A participant drew attention to the difference in the potential of a web-based facility between oral health improvement and service redesign. The participant added that this division might not be stable:

“It might help in terms of oral health improvement in particular because that’s still going to be local and rest in the local authority. In terms of service redesign I think the flexibility for service redesign locally is diminishing and the repository will be the NHS CB. But there is no harm in having a repository for both just in case because things might change.” ^{CDPH6}

A participant mentioned potential disadvantages of too much openness and suggested the BASCD or the NHS as potential hosts: *“If it was entirely freely open, I think some people might feel a bit constrained...so you might not be awfully open about what you did and what worked and what didn't so I think it might be helpful if that was perhaps just made available to BASCD members only or something like that or to NHS Commissioning only or something like that.”* ^{CDPH1} However, a participant preferred *“...a more public website where it could be accessed by people outside of BASCD. BASCD website is mostly used by BASCD*

members....I think it would be better in terms of dissemination.” ^{CDPH4} and another preferred *“...to go beyond BASCD members in order that non-BASCD members could draw upon the innovations presented.”* ^{CDPH7}

The facility could become a “...mess....”, discouraging use:

“If you've got a database of innovations that are in all sorts of different forms and it's basically any bright new idea that anyone's come up with, you can end up with a terrible mess ... and you may not want to spend time trawling through endless lists of stuff that people have done.” ^{CDPH3}

The same participant contributed in a similar vein:

“If it existed then people like me would certainly look at it once, whether we looked at it twice depends on what we got out of it the first time or how interesting it was and how accessible it was, how easy it was to use and how applicable it felt to your personal situation.” ^{CDPH3}

A consultant felt that such a facility could be useful for dissemination if it was “...easy....” ^{CDPH7} and another consultant said that *“It's got to be well managed.”* ^{CDPH4} and that there was a risk of *“...a big bang when it starts off and everybody sends their pieces of work and then nobody accesses the website... and then after a few months everything just fizzles out.”* ^{CDPH4} A consultant indicated that having contributions to such a facility was *“...no guarantee that it will be activated on.”* ^{CDPH9}

Clear ownership of the facility and good communication would be needed:

“... somebody needs to own it, somebody needs to make sure that...whenever anybody has something that they wish to share they will know how to contact so that communication strategy has to be very good.” CDPH4

APPENDIX 17: COMMUNICATION FROM THE BRITISH ASSOCIATION FOR THE STUDY OF COMMUNITY DENTISTRY: DENTAL PUBLIC HEALTH IN ACTION. GUIDELINES FOR AUTHORS

Dental Public Health in Action

Guidelines for authors

The new section in Community Dental Health, entitled 'Dental Public Health in Action', is intended to meet the needs of a wide range members, but particularly practitioners in the fields of dental public health or clinical care of special groups. Short articles from DPH practitioners are being sought from members in all relevant fields which illustrate the application of principles of dental public health. In contrast to academic papers these shorter items will not describe research or standard epidemiological surveys, nor will they follow the format of such papers. Rather, they will describe a piece of work that has been undertaken by a DPH practitioner and their team that is likely to be of interest and relevance to other practitioners. These may cover such topics as service re-design or re-alignment, health needs assessments or equity audits, examples of good engagement with patients, population or professionals, health improvement activities or any other topic which would be of interest to fellow DPH practitioners

Authors are asked to structure their articles under the following headings;

Public health competencies being illustrated,

Initial impetus for action,

Solution(s) suggested,

Actual outcome,

Challenges addressed,

Future implications and

Learning points.

This structure may not be suited to all types of projects or commentaries but authors should bear in mind the aims of the initiative and the British and European membership. Authors will be encouraged to share setbacks or unexpected outcomes within their articles, as well as positive and successful actions, as these can have great benefit for others who can learn from other's experience. Articles should be limited to 2,500 words with no more than one table and one small figure. A reviewing system will be applied and editorial assistance will be freely available, particularly for those who may not have wide experience in reporting for a journal.

Clearly, articles of this length will not be able to explore issues in great depth. Rather the intention is to give readers an opportunity to read of projects undertaken elsewhere, gain some understanding of the key points to consider, and give author's details for individuals to follow up if they wish to undertake similar or related activities.

Any DPH practitioner, at whatever level, may offer suitable articles to [REDACTED],
Deputy Editor, at [REDACTED]

This table shows the structure that reviewers are asked to complete

		Yes / No	Comments if necessary
1	Does the title reflect the contents of the paper?		
2	Is the content of current interest to dental public health practitioners?		
3	Is the problem adequately described?		
4	Is the response described in sufficient detail to be of assistance to someone wanting to react similarly?		
5	Is there sufficient information about the outcomes for the reader to judge the merit of the activity?		
6	Are the challenges adequately described and discussed?		
7	Are the implications of future developments sufficiently described and discussed?		
8	Are the references relevant and up to date?		

**APPENDIX 18: RESPONSE FROM RESEARCHER TO THE
COMMUNICATION FROM THE BRITISH ASSOCIATION FOR
THE STUDY OF COMMUNITY DENTISTRY. SENT BY EMAIL
30TH AUGUST 2012.**

To [name deleted].

Regarding the recent communication, *Dental Public Health in Action, Guidelines for authors*, it is possible that I could be of assistance.

I am currently working towards a PhD in dental public health at the School of Dentistry, University of Birmingham, with the assistance of my supervisors Deborah White, John Morris, and Kirsty Hill.

A fundamental part of my research is analysing how dental public health innovation/new knowledge is transferred between locations. My research to date has identified a need for a repository of information, similar to that which you appear to be wishing to create, so that information gained can be disseminated more easily to other locations.

I am happy to assist BASCD in providing knowledge gained from my ongoing research and I could, if invited to do so, assist BASCD in developing a central repository of the information that you suggest.

I would be grateful for your thoughts and perhaps we could have a quick conversation on the phone at some point. I have recently become a member of BASCD and I would very much like to be involved in this worthwhile project.

Kind Regards,

Paul Kelly

PhD researcher, School of Dentistry, University of Birmingham

APPENDIX 19: PROPOSAL FROM THE RESEARCHER TO BRITISH ASSOCIATION FOR THE STUDY OF COMMUNITY DENTISTRY. SENT BY E-MAIL 2ND OCTOBER 2012

The following is a reproduced communication from the researcher to the BASCD, proposing the development of a facilitated network for knowledge sharing between members.

I am undertaking a PhD in the field of innovation in dental public health (with a particular focus on reducing oral health inequalities) at the School of Dentistry, University of Birmingham. My supervisors are D. White, J. Morris and K. Hill. Innovation is frequently defined as being the adoption of something new at a particular location, even if it has already been done somewhere else. The diffusion/dissemination of innovations is variable and a prerequisite for knowledge transfer is access by both the knowledge provider and the recipient to a means of communication.

I have identified from my ongoing research a need for a repository for pieces of dental public health work carried out such that others in different locations can easily learn from them. This is congruent with the new section in Community Dental Health called “Dental Public Health in Action”. My research to date has also shown that the amount of preparation required to submit a paper to an academic journal, in combination with the absence of a simpler repository, can result in no publication at all. I therefore suggest that the repository

will be based on submissions following the format as already broadly described in the “Guidelines for authors” for “Dental Public Health in Action”.

It is envisaged that the development of a repository would be best served by a facilitated network¹ with BASCD both as the facilitator and the hub (being the point where knowledge both arrives and departs) and with each individual BASCD member collectively making up the periphery. Research shows that the sharing of knowledge within a group is enabled where individuals identify themselves with that group or “community of practice”². I suggest that BASCD is therefore well placed to perform a knowledge transfer function. The messages’ target audience will be clearly identified as those with a special interest in dental public health in the UK, as demonstrated through membership of BASCD.

Issues regarding appropriability, attribution, intellectual property and copyright etc. will need to be attended to through the development of appropriate rules³. Indeed, it is envisaged that the maintenance of attribution and appropriability will promote contributions to the repository from the periphery³ and might help overcome any tendency to hold on to knowledge rather than share it¹. It will be preferable that the knowledge provider displays a means of communication (e.g. email address) to enable subsequent interactive engagement with other members of the periphery, as such interactive engagement has been shown to be helpful in knowledge transfer.⁴ Emphasis may need to be placed on the desire to have projects reported that were not successful as well as those that were successful, as research shows that knowledge transfer in the former instance is less likely.⁵ Implementation will need to be accompanied by a credible argument for sharing knowledge⁵.

The supporting communications infrastructure is already present in that there is a journal and a website. The content of both of these platforms could be supplemented to accommodate the hub function of the facilitated network. Publication to the journal and/or website will

allow knowledge transfer to individuals from a different organisational background (within BASCD) to the knowledge donor, thus potentially helping to overcome perceived inter-organisational barriers to knowledge transfer in the NHS.⁶

Through my ongoing research I can contribute knowledge about what consultants would like to see in such a repository, how they would like it to be structured, and use additional information gained from reviewing the academic literature in the relevant domains.

In my PhD submission I would want to show how the network was set up. Research based on analysis of usage, or successful dissemination, would most likely fall beyond the time-frame of my PhD.

As the work will be part of my PhD, it will be provided free of cost to BASCD. In accordance with my interest in dental public health, I have recently applied to join BASCD.

Paul Kelly, 2nd September 2012.

1. Bate SP, Robert G. Knowledge management and communities of practice in the private sector: lessons for modernizing the National Health Service in England and Wales. *Public Administration* 2002;80(4):643-63.
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**APPENDIX 20: SECOND PROPOSAL FROM THE
RESEARCHER TO BRITISH ASSOCIATION FOR THE
STUDY OF COMMUNITY DENTISTRY. SENT BY E-MAIL 3RD
OCTOBER 2012.**

The following is a reproduced communication from the researcher to the BASCD, proposing the development of a facilitated network for knowledge sharing between members.

I am undertaking a PhD in the field of innovation in dental public health (with a particular focus on reducing oral health inequalities) at the School of Dentistry, University of Birmingham. My supervisors are D. White, J. Morris and K. Hill. Innovation is frequently defined as being the adoption of something new at a particular location, even if it has already been done somewhere else. The diffusion/dissemination of innovations is variable and a prerequisite for knowledge transfer is access by both the knowledge provider and the recipient to a means of communication.

I have identified from my ongoing research a need for a repository for pieces of dental public health work carried out such that others in different locations can easily learn from them. This is congruent with the new section in Community Dental Health called “Dental Public Health in Action”. My research to date has also shown that the amount of preparation

required to submit a paper to an academic journal, in combination with the absence of a simpler repository, can result in no publication at all. I therefore suggest that the repository will be based on submissions following the format as already broadly described in the “Guidelines for authors” for “Dental Public Health in Action”.

It is envisaged that the development of a repository would be best served by a facilitated network¹ with BASCD both as the facilitator and the hub (being the point where knowledge both arrives and departs) and with each individual BASCD members collectively making up the periphery. Research shows that the sharing of knowledge within a group is enabled where individuals identify themselves with that group or “community of practice”². I suggest that BASCD is therefore well placed to perform a knowledge transfer function. The messages’ target audience will be clearly identified as those with a special interest in dental public health in the UK, as demonstrated through membership of BASCD.

Examples of material that might be included are: New modes of delivery of dental public health measures; new ways of communicating dental public health messages; new knowledge regarding public engagement; new knowledge regarding engagement between dental public health and primary care; new initiatives regarding service re-design; outcomes of attempts at “social marketing”; new methodologies in conducting surveys, developing strategies or developing needs assessments; use of IT/social media in disseminating dental public health messages. There will, of course, be more.

Issues regarding appropriability, attribution, intellectual property and copyright etc. will need to be attended to through the development of appropriate rules³. Indeed, it is envisaged that the maintenance of attribution and appropriability will promote contributions to the repository from the periphery³ and might help overcome any tendency to hold on to knowledge rather than share it¹. It will be preferable that the knowledge provider displays a

means of communication (e.g. email address) to enable subsequent interactive engagement with other members of the periphery, as such interactive engagement has been shown to be helpful in knowledge transfer.⁴ Emphasis may need to be placed on the desire to have projects reported that were not successful as well as those that were successful, as research shows that knowledge transfer in the former instance is less likely.⁵ Implementation will need to be accompanied by a credible argument for sharing knowledge⁵.

The supporting communications infrastructure is already present in that there is a journal and a website. The content of both of these platforms could be supplemented to accommodate the hub function of the facilitated network. Publication to the journal and/or website will allow knowledge transfer to individuals from a different organisational background (within BASCD) to the knowledge donor, thus potentially helping to overcome perceived inter-organisational barriers to knowledge transfer in the NHS.⁶ Although I cannot currently access the member area of the website, I would suggest that a stand-alone tab (with a title such as “knowledge bank” or “innovation”) would lead to a drop down menu of pages representing potential domains of new knowledge. Each page could then contain a “form” for the knowledge donor to complete. A contribution to any of these pages could trigger an email to all members.

Through my ongoing research I can contribute knowledge about what consultants would like to see in such a repository, how they would like it to be structured, and use additional information gained from reviewing the academic literature in the relevant domains.

In my PhD submission I would want to show how the network was set up. Research based on analysis of usage, or successful dissemination, would most likely fall beyond the time-frame of my PhD.

As the work will be part of my PhD, it will be provided free of cost to BASCD. In accordance with my interest in dental public health, I have recently applied to join BASCD.

Paul Kelly, 2nd September 2012.

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APPENDIX 21: FOLLOW UP LETTERS TO THE BASCD REGARDING THE PROPOSED INNOVATION HUB.

Sent by e-mail on 21st December 2012.

Dear [name deleted],

I enjoyed meeting you at the last BASCD event in London, which I found hugely informative and rewarding. It was great to be able to share my ideas with others, and also to learn so much from colleagues from all over Europe.

Time is passing by and I am now planning the subsequent stages of my Ph.D. programme.

You will recall that I made a proposal for assisting BASCD in setting up an electronic idea/innovation sharing facility for BASCD members, as a possible aspect of my Ph.D. I now have to decide whether to take the alternative plan that does not include this. I therefore need to know whether BASCD would like to go ahead on this proposal, or whether BASCD does not consider this appropriate at this time.

Whatever BASCD decides, please be assured of my ongoing support of the greater aims and ambitions of BASCD.

Kind Regards, Paul Kelly

Sent by e-mail on 28th February 2013.

Dear [names deleted],

owing to the passage of time I have decided to move on with my Ph.D. as I will no longer be able to accommodate the development of an information sharing facility with BASCD in the remaining time for my research before I enter my writing up period.

Please be assured that I continue to value the work of BASCD and I intend to continue as an active member in the future.

My research has included gathering of information relating to adoption and dissemination of innovations in dental public health, and if I can be of assistance in future in this regard, outside of my Ph.D., then I am happy to be contacted.

Kind Regards,

Paul Kelly.

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