A MIXED-METHODS EXPLORATION OF PRIMARY CARE AS A SETTING FOR DELIVERING SECONDHAND SMOKE HARM REDUCTION INTERVENTIONS

by

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ABSTRACT

There is no safe level of exposure to secondhand smoke (SHS). Many non-smokers in the UK remain at risk of exposure to SHS and the associated consequences. Healthcare professionals (HCPs) working in UK primary care settings are considered well placed to deliver interventions which would promote (and support) reductions in SHS exposure for non-smokers.

This thesis adopts a mixed-methods approach to explore the potential for using primary care settings to deliver SHS harm reduction interventions. Firstly, a systematic review highlights the need to conduct further research to explore primary care-based SHS harm reduction approaches. Subsequently presented are the results of: a national survey of HCPs (n=172); qualitative interviews with HCPs (n=25) and smokers (n=9); and a mixed-methods integration of these study findings. The COM-B Model of behaviour change underpins these studies. Motivation favouring SHS intervention delivery was evidenced by HCPs and smokers; both understood the negative consequences of SHS exposure. However, HCPs lacked the opportunities and capability to intervene in practice.

Overall, this thesis highlights a need to improve the educational training and physical opportunities available to primary care-based HCPs; thereby helping them to better deliver SHS harm reduction interventions to smokers in the future. Intervention considerations are suggested herein.

I DEDICATE THIS THESIS TO MY DAD, THE PROF.

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“Miracles happen all the time, the impossible just takes a bit longer.” (Dr Bhai Sahib Bhai Mohinder Singh Ji)

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LIST OF ABBREVIATIONS

C	**CI**	Confidence Interval
	COM-B	Capability, Opportunity, Motivation – Behaviour
D	**DeSSIP**	Delivering secondhand smoke intervention in primary care study
	DeSSHaRM	Delivering secondhand smoke harm reduction messages in primary care: a cross-sectional survey of healthcare professionals
	Dp	Decimal places
E	**EPPI-Centre**	Evidence for Policy and Practice Information Co-ordinating Centre
G	**GBD**	Global Burdens of Disease
	GCP	Good Clinical Practice
H	**HCP(s)**	Healthcare professional(s)
I	**IHME**	Institute for Health Metrics and Evaluation
J	**JBI**	Joanna Briggs Institute
L	**LRTI**	Lower Respiratory Tract Infection
M	**MRC**	Medical Research Council
O	**OR**	Odds Ratio
	PhD	Doctor of Philosophy
	PIL	Patient Information Leaflet
R	**RCP**	Royal College of Physicians
S	**SHS**	Secondhand smoke
	SHSe	Secondhand smoke exposure
	SUDI	Sudden Unexpected Death Syndrome in Infants
T	**TDF**	Theoretical Domains Framework

U	**UoB**	University of Birmingham
	UK	United Kingdom
	US/USA	United States of America

FORMAT OF THESIS

This thesis has been written and submitted in accordance with the University of Birmingham Alternative Thesis guidance.

CHAPTER 1:

THESIS INTRODUCTION AND BACKGROUND

Using a mixed-methods approach, this thesis explores the potential use of primary care services in the delivery of secondhand smoke (SHS) harm reduction interventions. The first chapter provides the background and rationale for the research questions addressed within this thesis. This chapter is structured to present a critical synthesis of considerations regarding SHS, encompassing: 1) the definition of SHS used within the thesis; 2) a description of the mortality and morbidity consequence subsequent to SHS exposure highlighting the need for preventative action; 3) the estimated global and national burden of SHS exposure demonstrating the scale of the associated public health burden; 4) a critical summary of currently tested interventions used to reduce non-smokers' exposure to SHS, and; 5) a discussion of the potential role of UK primary care in addressing the limitations of current approaches and how service implementation could take place in this setting. Following these points, the rationale of the thesis with associated aims, objectives and a summary of the empirical work undertaken are described.

1.1 What is secondhand smoke?

The World Health Organization (WHO) describe SHS as "one of the most important and widespread exposures in the indoor environment."[1] The most commonly adopted and accepted definition in recent time of SHS is taken from the Tobacco Free Initiative (TFI).[1] The

TFI describe SHS as a combination of 'mainstream smoke' which is the air exhaled by active smokers and 'sidestream smoke' which is produced when tobacco products are burned.[2,3]

Despite the currently adopted definition, there has been variation in the definitions used to describe SHS over time. For example, the term environmental tobacco smoke (ETS), introduced by the tobacco industry,[1] was previously used to describe an equivalent exposure to SHS. However, WHO have since advised against the use of ETS as it implies the 'environmental' exposure may not be involuntary in contrast to the more favourable term 'secondhand.'[1] Additionally, other terms exist where SHS has been referred to as 'tobacco smoke pollution', 'passive smoke' or 'involuntary smoking.'[1,4] Most likely as a result of the WHO adoption of the TFI definition, SHS has now emerged as the preferred term commonly reported within the literature.[1] Therefore, SHS will be used throughout this thesis.

1.2 Why is secondhand smoke a problem?

Health as defined by the WHO "is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity."[5] For those exposed to SHS, there is a vast burden of associated short and long-term negative consequences in each of the key domains for good health (physical, mental and social), as well as a substantial financial cost to global health services and the wider economy. [6–9] The proposed mechanism behind the ill health associated with secondhand smoke exposure (SHSe) relates to the chemical composition of toxins within tobacco smoke.[10] Tobacco smoke is estimated to contain over 7000 chemicals, many of which are known toxins (~100) and carcinogens (~70).[11] The

accumulation of causally tested evidence over the decades has clearly established that no level of SHSe is safe to health.[10]

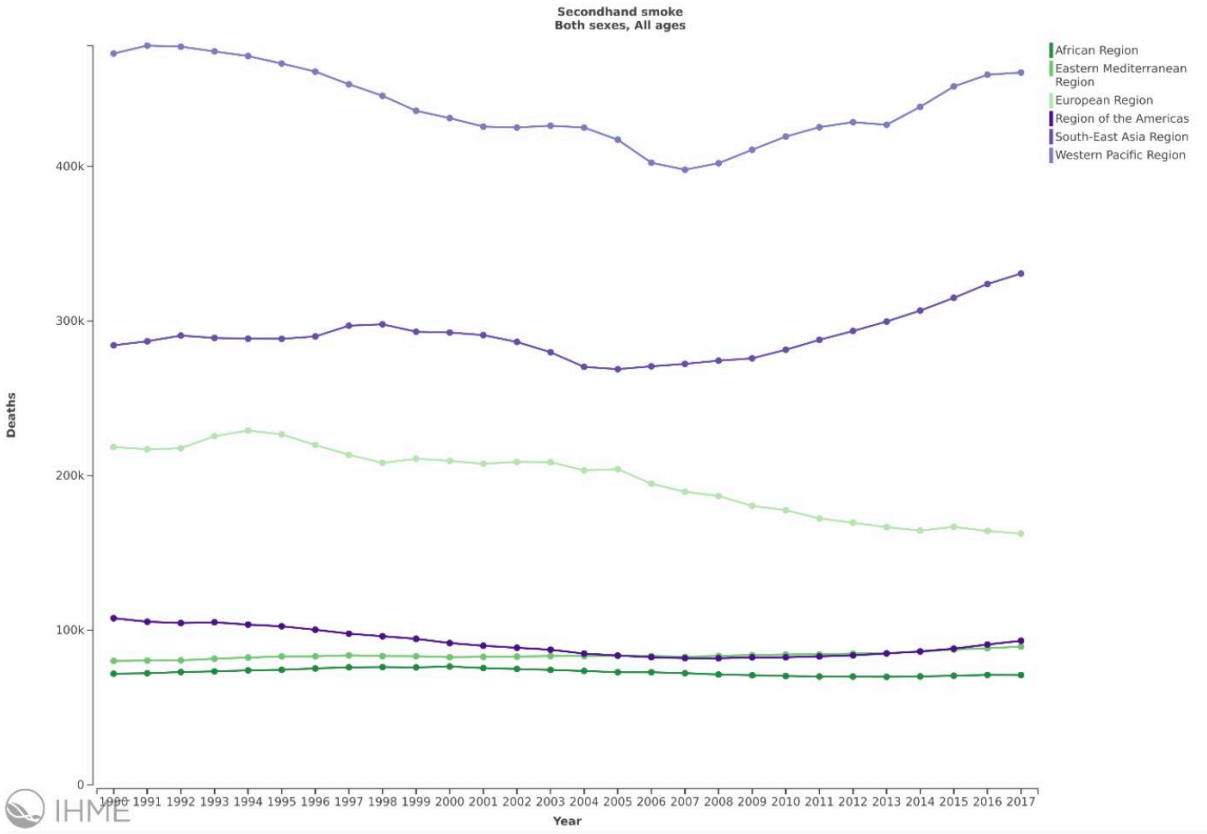
1.2.1 Mortality associated with secondhand smoke exposure

In 2004, it was estimated that SHSe contributed to 1% of global mortality, resulting in the death of approximately 603,000 non-smokers annually.[12] This global estimate was derived from retrospectively collected data across 192 countries. Unlike other estimates describing the mortality burden associated with SHSe, which often include other air pollutant data (such as biomass fuels[1]), these findings were specific to SHSe related mortality. However, as this study relied on published epidemiological estimates of SHSe, there was a selection/publication bias in the selection of studies highlighted by the under-representation of lower-middle-income countries (LMICs) compared to high-income countries (HIC) due to lack of suitable data. This may be due to improved surveillance methods in HICs. This is of particular note as SHSe is inherently related to population-level smoking rates, which since 2004, have shown variation between LMICs and HICs globally. Current trends suggest worsening rates of SHSe in some LMICs (due to increased rates of smoking uptake in these regions) in contrast to the average global decline.[13] Therefore, more recent studies are required to robustly quantify the mortality associated with SHSe.

An alternative approach to capture SHSe related mortality data is adopted by the more recent Global Burdens of Diseases (GBD) 2017. This study estimated 8 million smoking-related deaths each year, of which 1.2 million deaths were attributable to SHSe amongst non-smokers.[13,14] The approach adopted by the GBD collaborators integrated a more extensive and recent set of epidemiological data, across 195 countries worldwide, including

information derived from Global Adult Tobacco surveys, Eurobarometer surveys and WHO STEPwise approach to surveillance (STEPs) surveys which were able to give shed clarity in SHSe prevalence and related mortality rates including in WHO regional LMICs.[13] Using this approach, the global percentage change in the prevalence SHSe between 1990 and 2017 demonstrated an overall reduction of 21.43% (95% confidence intervals (CI) 19.30, 23.56). Due to reduced SHSe prevalence, we should anticipate a reduced mortality burden associated with SHSe. However, in reality it is not clear, which may be related to more recently changing patterns of tobacco use in some regions.[13] The breakdown of SHSe attributable mortality estimates across each of the WHO global regions between the years 1990 and 2017 is provided in Figure 1.1.

Figure 1.1 Trends in SHSe attributable mortality across the WHO global regions between 1990-2017 (Data were taken from the Institute for Health Metrics and Evaluation (IHME)[15])



It is possible to glean some insight from the broad regional trends suggesting more recent and marked increases in SHSe related mortality in regions such as the Western Pacific and South-East Asia. In contrast, the European region has shown the steepest decline across all of the captured years. However, the GBD is more granular and can show specific trends by country within Europe. Figure 1.2 describes the mortality attributed to SHSe by Western European country.

Figure 1.2 Trends in SHSe attributable mortality across Western Europe countries between 1990-2017 (Data adapted from the Institute for Health Metrics and Evaluation (IHME)[15])

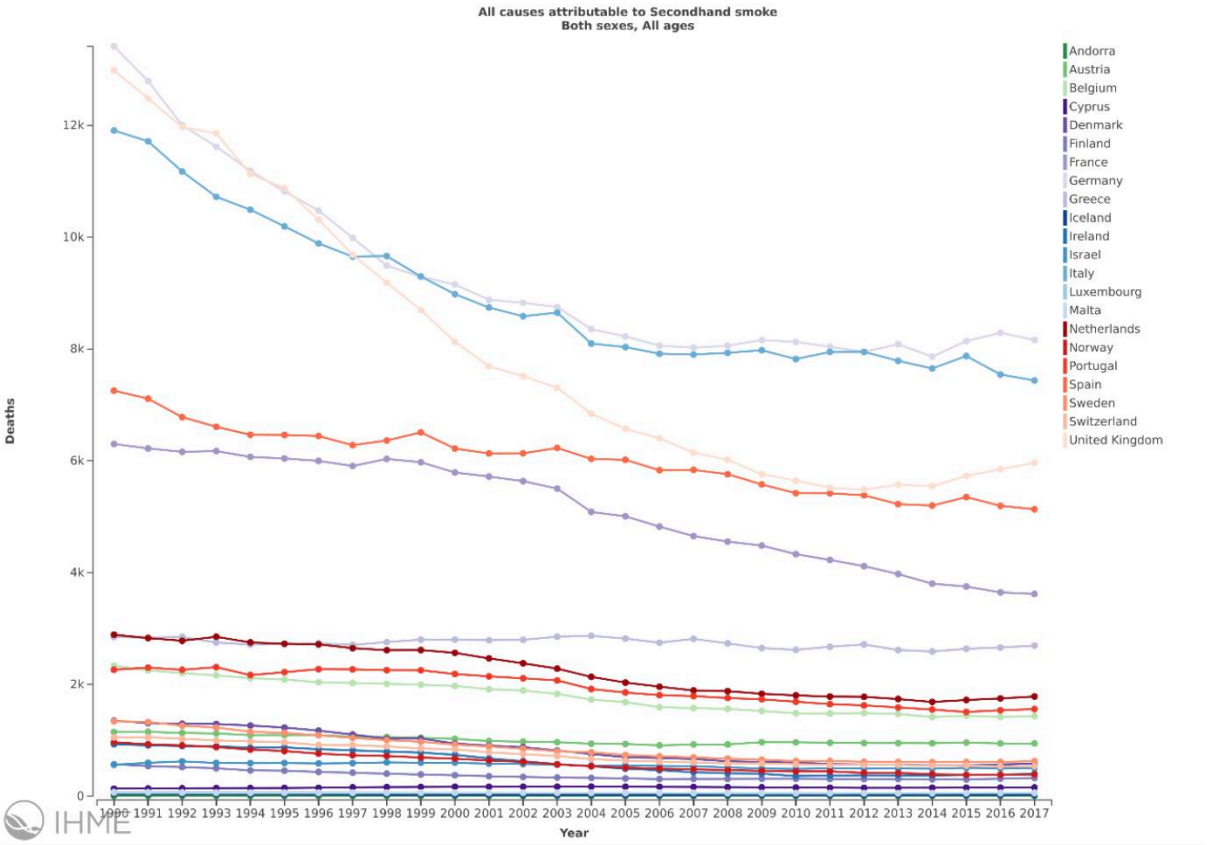


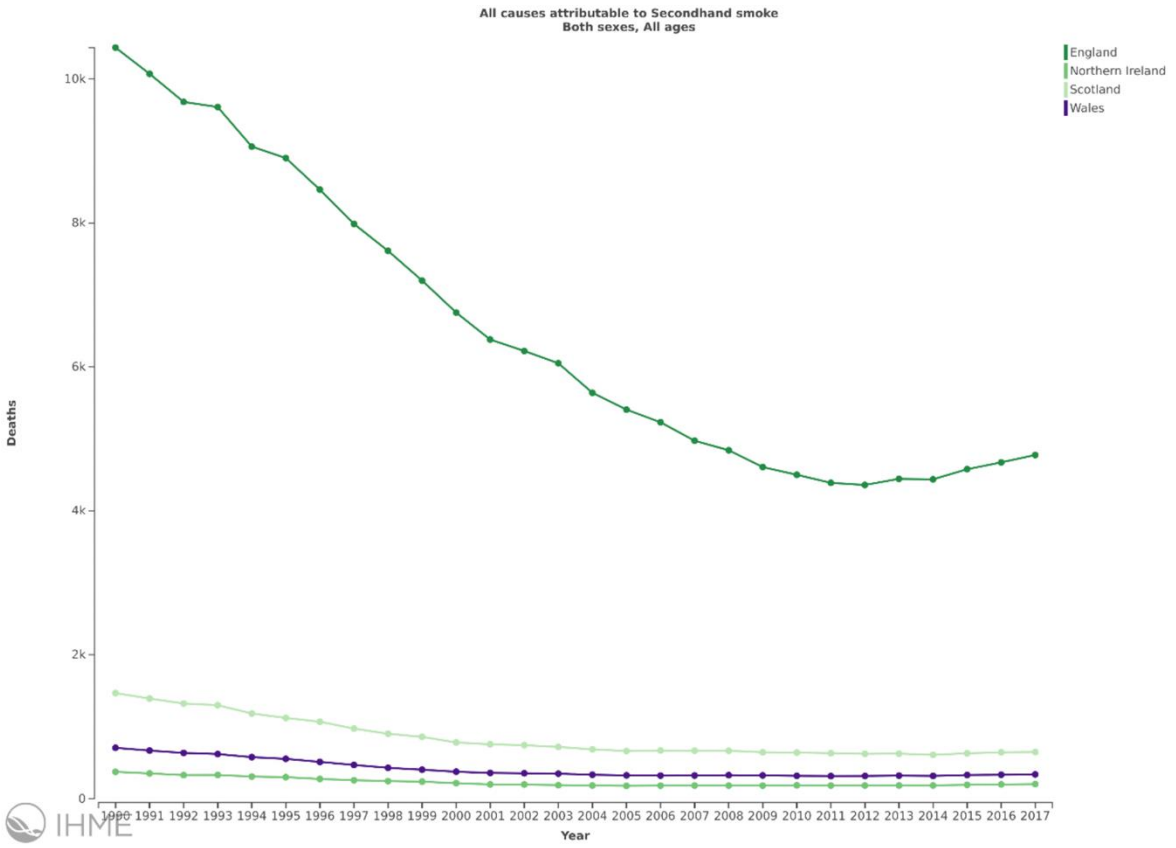
Figure 1.2 demonstrates a steep decline in attributable deaths from 1990 until the early 2000s in most Western European countries, likely associated with successful public health policies and activities focussing on smoking prevention.[16] The public health action aimed to raise awareness of the detrimental consequences attributed to smoking which, when combined with better provision of cessation support and statutory bans were likely responsible for the reductions in mortality over time.[17] Of note to the thesis, the trend corresponding to the United Kingdom (UK) data shows a worryingly converse pattern to

many other European HICs. Since 2012 there has been an increase in SHSe attributable mortality.

A limitation of the GBD approach to describing SHSe is that occupational and home exposure to SHS are combined into a single SHSe metric. When examining the impact separately, the most recent estimates from 2003 illustrate that in the UK there was estimated to be over 11,000 adult deaths each year as a consequence of SHSe in the home environment specifically.[18] Despite methodological limitations, the UK appears to have remained as having the third-highest number of deaths relating to exposure to SHS in Western Europe in 2017 and appears to still be increasing.

The UK has an interesting history relating to smoking prevention policies, as it has over time differed in each of the four constituent countries (England, Wales, Scotland and Northern Ireland).[19] Therefore, it is important to consider their SHSe related mortality separately (Figure 1.3).

Figure 1.3 Trends in SHSe attributable mortality in UK Countries between the years of 1990 and 2017 (Data adapted from the Institute for Health Metrics and Evaluation (IHME)[15])



On examination of the mortality data within the UK, it clear that the English data has shown the clearest upwards trend over recent years where it was estimated that in 2017 there were 4,776 (IQR: 3,540– 6,243) deaths attributed to SHSe in England alone.[15]. Following the plateau in the mortality rate in England around 2010-2012 (likely due to the impact of public health approaches and increased funding for support services), the recent rise in SHSe-related mortality is likely to be associated with changes funding cuts and loss of cessation

support services. For example, England has witnessed a recent and substantial decline in the number of local authorities funding stop smoking services.[20]

It is clear from the evidence described in this section that the attributable mortality associated with SHSe remains substantial globally and is a clear public health problem. Within Europe, the UK (England particularly) appears to be experiencing a recent increase in SHSe-related mortality. Thus, there is a need for research to explore the delivery of interventions in UK (mainly English) settings which might address and help prevent deaths from SHSe in the future.

1.2.2 Morbidity associated with secondhand smoke exposure

The substantial attributable mortality risk is a consequence of the vast morbidity burden in non-smokers due to SHSe.[11] Table 1.1 summarises the current evidence of causally linked and well-established subsequent disease associations which vary depending on the age of exposure and outcome development (prenatal, childhood or adulthood).

Table 1.1 Health conditions associated with SHSe from different sources for foetal, child and adult non-smokers (data extracted and synthesised from US Surgeon General Reports in 2006[10] and 2014[11] and RCP reports in 2010[21] and 2019[22])

Diseases which have an increased risk of developing following SHSe	**Timepoint of SHSe which predisposes the health risks**		
	Foetal SHSe from maternal active smoking and/or SHSe during pregnancy	**Childhood SHSe**	**Adult SHSe**
CONDITIONS DEVELOPED IN-UTERO/ INFANCY/ CHILDHOOD			
Childhood cancers (Brain & central nervous system tumours, lymphoma, and acute lymphoblastic leukaemia)	X	X	
Congenital heart defects at birth	X		
Defects of face and neck at birth (including orofacial clefts)	X		
Dental caries		X	

Disruptive behavioural disorders and attention deficit hyperactivity disorder	X		
Foetal mortality	X		
Incidence of wheeze		X	
Low birth weight	X		
Lower respiratory illnesses (including unspecified lower respiratory tract infections, bronchitis, bronchiolitis, acute respiratory infections)		X	
Meningococcal disease (Meningococcal or bacterial meningitis)		X	
Middle ear infection		X	
Musculoskeletal defects at birth	X		
Obesity	X		
Onset of asthma		X	
Pre-term birth	X		

Reduced lung function		X	
Respiratory complications after surgery		X	
Sudden unexpected death syndrome in infants		X	
CONDITIONS DEVELOPED IN ADULTHOOD			
Acute respiratory symptoms (including cough, wheeze, chest tightness, and difficulty breathing)			X
Cancers (lung cancer, nasal sinus cavity cancer)			X
Chronic Obstructive Pulmonary Disease			X
Chronic respiratory symptoms			X
Coronary heart disease			X
Declining lung function			X
Difficulty getting pregnant			X
Nasal irritation			X

Onset of adult asthma			X
Reproductive effects in women (including low birth weights, pre-term births)			X
Stroke			X
Subclinical vascular disease (Atherosclerosis)			X
Worsening of asthma control			X

SHSe: Secondhand smoke exposure

When examining table 1.1, it is clear the associated morbidity in adults largely mirrors those diseases subsequent to active smoking (caused by biochemical pathways triggered as a result of chemical exposure from tobacco smoke) which include: cardiometabolic disease, respiratory conditions and cancer.[10,11] Due to the differing morbidity patterns, the effects on children and adults are described in more detail below.

1.2.2.1 Childhood morbidity associated with secondhand smoke exposure

Although Table 1.1 described the associated morbidity burden in adults, the negative effects of SHSe also manifest in childhood (defined as under 18 years of age) morbidity. In order to further expand on the quantifiable risk of SHSe in childhood, Table 1.2 is a synthesis of the most recent systematic review and meta-analysis evidence concerning childhood morbidities commonly associated with SHSe, broken down by tobacco smoker within the household.

Table 1.2 Risks of developing health conditions in childhood following SHSe as published in the most recent systematic reviews and meta-analyses

Disease	**Risk of child developing disease following SHSe (OR (95%CI))**			
	Prenatal maternal smoking	**Postnatal maternal smoking**	**Paternal smoking**	**Household SHS**
Middle ear disease[21]	1.11 (0.55, 0.24)	1.46 (1.21, 1.76)	1.27 (0.97, 1.66)	1.35 (1.23, 1.49)
Asthma[23]	1.23 (1.12, 1.36)	1.20 (0.98, 1.44)	0.98 (0.71, 1.36)	1.30 (1.04,1.62)
Wheeze[23]	1.52 (1.23, 1.87)	1.18 (0.99, 1.40)	1.39 (1.05, 1.85)	1.32 (1.12,1.56)
Lower respiratory tract infections[24]	1.15 (0.97, 1.36)	1.62 (1.46, 1.79)	1.19 (1.10,1.29)	1.82 (1.51, 2.19)
Sudden unexpected death in infancy[21]	2.94 (2.58, 3.36)	3.15 (2.58, 3.85)	1.45 (1.07, 1.96)	

Meningococcal disease[25]	2.93 (1.52, 5.66)	N/A	N/A	2.18 (1.63, 2.92)

SHSe: Secondhand smoke exposure CI: confidence intervals; OR: odds ratio; SHSe: secondhand smoke exposure
An odds ratio (OR) with 95% confidence interval (95% CI) has been used to describe the association between SHSe and subsequent morbidity, not all of which reached significance (see Table 1.2).

In Table 1.2, it can be seen that maternal (during peri-natal and post-natal period) smoking behaviours displayed the largest highest effect size describing the increased risks of the subsequential childhood morbidity when compared to paternal or other household smoking behaviours. The greatest risk difference was seen across the groups related to sudden unexpected deaths in infancy (SUDI). [21]

This pattern may be due to length and proximity of exposure being increased in the case of the mother when compared to other household members, due to numerous factors including but not limited to breastfeeding or pre-school caring responsibilities. However, further research is needed to explore these pathways as there were high levels of heterogeneity possibly associated with variations in the definitions of SHSe and outcomes. Additionally, in the case of SUDI, a relatively rare occurrence in the UK, further research may be required to narrow the effect size and to increase the precision of the estimate of risk. Other biases may also be present which influence the findings for post-natal maternal smoking behaviour results as mothers may have additionally smoking during the peri-natal stage, so the cumulative risk of smoking and associated SHSe may not be captured in the current literature.

The detrimental health consequences are not limited to the incidence of morbidity but also the following indirect cascade of events. For example, the experience of middle ear disease in childhood can escalate if left untreated and can lead to hearing impairment.[26] Consequences of such disability may spread into the child's social life having implications for both relationship development and education.[27]

The consequential associated disability-adjusted life-years (DALYs) through such means have been estimated children exposed to SHSe.[12] For example, there were 651,000 DALYs reported as a consequence of SHSe-induced asthma in childhood.[12] The indirect effects transcend beyond the development of further comorbidity. They also relate to the development of negative lifestyle behaviours.[28] For example, children exposed to smoking by a household member are significantly more likely to themselves take up smoking in future (OR 1.92; 95% CI 1.70,2.16)[28] thereby predisposing them to the well-established detrimental health effects of active smoking (described in further detail table 1.3).[11]

Table 1.3 The detrimental health consequences of active smoking (Adapted from the US surgeon general report 2014)[11]

Autoimmune/ inflammatory conditions	Diabetes
	Periodontitis
	Rheumatoid arthritis
Bone-related conditions	Hip fracture

Cancers	Acute myeloid leukaemia
	Bladder
	Cervix
	Colon and rectum
	Kidney and ureter
	Larynx
	Liver
	Oesophagus
	Oropharynx
	Pancreas
	Stomach
	Trachea, bronchus and lung
Cardiovascular/ cerebrovascular conditions	Aortic aneurysm
	Coronary heart disease
	Peripheral vascular disease
	Stroke

Eye conditions	Age-related macular degeneration
	Cataract
Reproductive system/ pregnancy-related conditions	Congenital orofacial cleft
	Ectopic pregnancy
	Male erectile dysfunction
	Reduced fertility in women
Respiratory conditions	Asthma
	Chronic obstructive pulmonary disease
	Pneumonia
	Tuberculosis

Where previous definitions of SHS had suggested that exposure may be voluntary, there are few if any occasions due to the legal capacity of children where childhood exposure is ever voluntary.[1] Therefore, action is needed to prevent the development of morbidity in a setting appropriate for children.

1.2.2.2 Adulthood morbidities associated with secondhand smoke exposure

Similarly to exposure in childhood, SHSe has many detrimental effects on the health of adult non-smokers.[11]

Historically, based on the original findings of the British Doctors study, being a current smoker is causally linked with the development of lung cancer.[29] Subsequent studies have been able to replicate this relationship between SHSe and the development of lung cancer.[30] The International Agency for Research on Cancer (IARC), following systematic data synthesis, have estimated the risk of developing lung cancer in never-smoking men and women who reside with a smoker increases by ~30% and ~20% respectively.[30] However, the toxic burden of SHSe transcends lung cancer and is demonstrated to be associated with many other cancers such as cervical cancers in female non-smokers.[30,31]

In addition to the increased risk of lung cancer, SHSe in adults is also associated with an increased risk of other chronic respiratory conditions.[32] For example, there is evidence of a causal association between SHSe and chronic respiratory symptoms, as well as, the exacerbation of chronic obstructive pulmonary disease (COPD) and asthma.[32]

Beyond respiratory disease and cancer, SHSe is also associated with cardiovascular disease (CVD), a leading cause of death in the UK.[33] SHSe has been reported to increase non-smoking adults' risk of coronary heart disease (CHD) by at least 25% (relative risk (RR) 1.25; 95% CI 1.17, 1.32).[32,34] Although a limitation of the evidence showing the association between SHSe and the subsequent development of CHD is that the definitions of both CHD and SHSe have changed over time.[34] When examining a specific subtype of CVD, a strong dose-dependent association exists between SHSe and the subsequent development of stroke.[35] Although a strong association was present, within this analysis, there was again heterogeneity in the definitions and outcomes.[35] Despite the limitations, the authors conducted a random effects model and reported a 25 – 56% increase in risk dependent on SHSe level.[35]

1.2.3 Healthcare service and economic burden

In light of the above reported subsequent morbidity and associated DALYs, there is a consequential burden both in terms of demand and finances on the healthcare services and economies.[8] In the UK, an estimated 822 children per day are seen by a General Practitioner (GP) for symptoms and signs related to SHSe and 26 children per day are admitted to hospital for SHSe-related illnesses.[21] As a result, it is estimated that within a single year, there can be expected to be an additional 300,000 GP consultations and over 9,500 hospital admissions due to childhood SHSe.[21] Table 1.4 displays the estimated number of cases reported for SHSe-related childhood illnesses as a proxy for demand on services.

Table 1.4 The number of cases documented each year for UK childhood health conditions attributable to SHSe (Data were taken from the Royal College of Physicians 2010.)[21]

Childhood health condition	**Number of cases attributable to SHSe in the UK**
Lower Respiratory Tract Infections	>20,000
Middle Ear Infections	120,000
Asthma & Wheeze	22,000
Bacterial meningitis	200
Sudden Unexplained Deaths In Infants	40

SHSe: secondhand smoke exposure; UK: United Kingdom

The data seen in table 1.4 are likely to be an underestimate as it will not capture the total number of contacts with the NHS across all healthcare services (beyond contacts with the GP) for each patient case per year; nor does it indicate the resource and financial burdens placed on healthcare services as a result. In addition, it is likely that a child with a documented health condition will have multiple contacts with healthcare providers (beyond their GP) each year. Furthermore, the data presented relates only to childhood associated illnesses, it can be assumed that these burdens are likely to be higher when the societal costs attributed to adults' SHSe are also considered and accounted for. Currently, the number of contacts across healthcare professional groups and the number of cases of SHSe-related health conditions in adults are not reported for the UK.

It was estimated in 2010 that primary care consultations and treatment for asthma associated with SHSe cost the NHS an annual ~£9.7million.[21] Beyond service demand, financial estimates from 2018 suggest that SHSe during childhood costs the NHS in England between £5 million and £12 million per year solely for those cases where a child is admitted to secondary care settings (i.e. hospitalised cases).[22] When considering non-admitted day cases, outpatient appointments or emergency department attendances, this is likely to be a significant underestimate of the true cost of SHSe. Considering the costs in terms of both financial and service demand of associated illnesses related to SHSe, there is a clear need for interventions targeting those at the greatest risk.

1.3 Who is affected by secondhand smoke exposure?

The previous sections have provided insight into the definition of SHSe (Section 1.1) and the associated burden of ill health (physical, psychological and social) shown to be associated with SHSe, particularly for children (Section 1.2) suggesting the seriousness of the public health issue. However, before interventions can be implemented a greater understanding of the burden of SHSe is needed, as well as inequalities predisposing differential risk in society. Prior to understanding the nuances in SHSe epidemiology, it is important to understand how SHSe can be measured.

1.3.1 Measuring the level of secondhand smoke exposure in an environment

The level of exposure to SHS usually can be estimated using three various methods: environmental, self-reported and biological markers. These can involve indirect and direct measurement techniques providing objective or subjective estimations of SHSe.[3]

Environmental markers offer an objective measurement taken using an indirect approach.[3] These markers will typically give an estimation of the amount of SHSe that a person has been exposed to through the use of the proxy measurement of the concentration level of SHS in the environment; i.e. air sampling to quantify the presence of known SHS components.[3] Nicotine and solenasol are the recommended markers of choice as their presence is more unique to the SHS. Thus, the readings are more accurately reflective of SHSe and are less likely to be influenced by other sources of these chemicals.[3] Nicotine measurements are easier and therefore, cheaper to attain the solenasol readings.[3] There is a caveat to using environment markers for SHSe measurement – these proxy measures will not attest to levels of exposure across all environments in the testing period. It is possible the non-smoker may

be at risk of SHSe in additional settings other than those where samples of air have been tested.[3] In addition to this, non-smokers' level of exposure to SHS is likely to also be affected by the amount of time that they spend in a specified environment(s) as the frequency of smoking and consequential SHSe may be higher with a longer time spent in an environment where there is smoking activity.[7] These markers may possibly underestimate a person's total exposure to SHS due to these limitations.[3]

Self-reported measures, obtained through questionnaires, for example, are based on more subjective measurements and again adopt an indirect approach to SHSe measurement.[3] There are potential biases, such as social desirability bias or recall bias, which may make this clinically useful measurement less reliable. For example, the reporter may not fully disclose the level of exposure if they feel embarrassed about the truth or if they are unable to accurately recall the exposure level.[36] However, it has been demonstrated that self-reported exposure levels offer similar results to those obtained through measuring biologic markers.[2,36] Therefore, this proxy measurement of SHSe may offer a useful estimation in circumstances where other, more reliable measures are not available.

Biologic markers, such as cotinine and nicotine, give a direct measurement of SHSe and offer the most objective and reliable assessment of SHSe.[3] As such, measurements of biologic markers are often used in research studies to ascertain the accuracy and clinical usefulness of using indirect SHSe measures such as self-reported data.[36] By providing direct measurements of the absorbed levels of SHS following exposure, biological markers are useful for studies aiming to determine health effects according to doses of SHSe.[3,37] However, there may exist variation between individuals which can in turn influence the

amount of marker present following the same environmental exposures to reflect individuals' absorption and metabolism of the SHS and effect on the body.[3] Thus, biomarkers can offer useful comparisons at an individual level but not always on an environmental level unless the sample size is large enough for measurements to be considered representative of the group's SHSe levels.[37]

Nicotine, which is present in all tobacco products,[37] is metabolised within the human body to form cotinine among several other metabolites.[3,37] Cotinine can be detected in the blood, saliva and urine of patients' who are exposed to SHS and as such is the most commonly used biological marker of SHSe.[3,37] Blood-cotinine concentrations give an accurate measurement of the level of SHS that has been absorbed, as cotinine is released into the bloodstream by the liver following the metabolism of nicotine.[37] However, obtaining blood-cotinine concentrations involves an invasive method of data collection, resulting in other methods of data collection being more preferable.[37] The cost of blood-cotinine concentration analysis is a further disadvantage of this particular biological marker.[37] Measurement of the amount of cotinine present in patients' saliva or urine is easier and less invasive to access than blood-cotinine concentrations.[37] It has been established that salivary and urinary cotinine concentrations correlate with cotinine concentrations as determined by blood-serum measurements.[3,37]

1.3.2 Global epidemiology

As highlighted previously, a 2004 retrospective summary of epidemiological estimates evidenced that globally one-third (33% of males and 35% of females) of the non-smoking adult population are exposed to SHS on a regular basis.[7] At this point the global prevalence

of SHSe among children was higher than for adults; 40% of children reportedly being regularly exposed to SHS.[7] This is thought to reflect the lack of autonomy on the part of children being less able to control their location and the conditions of the environment than adults.[7] The highest rates of SHSe were recorded in European, Western Pacific and Southeast Asian countries.[7] The study included further data across sub-regions of the world which showed similar patterns, although minor variations were evident potentially due to the heterogeneity in the definition of SHSe, and the inability for granular extraction of demographic-specific profiles.[7] However, an updated prevalence profile was needed to best reflect the current global levels of SHSe.

Following the 2004 estimates, the Global Adult Tobacco Survey (GATS) published in 2016,[38] provided an updated prevalence profile for SHSe among children across 21 countries using data from 2009 to 2013. This study included data from 21 countries (two HICs and 19 LMICs) and only focussed on children's SHSe and so was not as comprehensive as the Oberg 2011 paper using data taken from 2004.[7] The authors reported that among the 21 countries included, over 507 million children under 15 years old were at risk of SHSe in the home environment; translating to 48.7% of the total study population.[38] The countries with the highest childhood SHSe rates were from the Asian and Australasian continents (namely, China, India, Bangladesh, Indonesia and the Philippines), which contributed to 84.6% of the childhood SHSe reported in this study.[38]. In addition to the above findings, the study authors identified that there was a higher prevalence of childhood SHSe in rural areas in comparison to prevalence in urban areas.[38] Furthermore, the prevalence was higher in countries with higher rates of active smoking in the adult population.[38] It is important to note that the findings of this study were based on self-reported data collected through individual and

household questionnaires. Although past research has suggested that there is a correlation between self-reported measurements and biological markers of SHSe,[36] it would strengthen the generalisability of these results if equivalent biomarker data were available and showed similar estimates (although this may not be feasible on such a large scale study). As the global data are not current, further attempts to understand the true burden of SHSe must be drawn from robust international, national and local data sources.

1.3.3 English epidemiology

Further to global estimates of SHSe prevalence, there have been a collection of studies which have provided estimates of SHSe levels specific to England over time.[39–42] The vast majority of these UK data relates to children's SHSe as they are often perceived to be the most at-risk category for being exposed to SHS in homes.[39–42] It has been acknowledged that younger children may show a higher level of exposure than adults following the same duration of exposure to SHS in the same setting due to a higher respiration rate and less control over their environments; thus they are at higher risk of exposure and the associated health consequences which may contribute to greater research interest in their outcomes.[1,43]

Between the years 1988 and 1998, Jarvis *et al.*,[41] demonstrated a decline (geometric mean cotinine levels reduced by almost a half) in children's biochemically validated SHSe levels. The data that were analysed in this study had been collected to measure childhood smoking prevalence via cross-sectional school-based surveys which measured the salivary cotinine concentrations of secondary school children aged 11-15 years.[41] Interestingly in this study, children whose parent(s) were smokers experienced little change in SHSe during this time

period. Instead, the reductions were mostly observed in those children who lived in non-smoking homes or where the child's parent(s) had ceased smoking.[41] Thus it seems that the observed reductions were not as a result of smoking parents adopting protective measures such as smoking outside the home, rather the reduction was a reflection of the decrease in the prevalence of smoking parents.

Following this study, Sims *et al.*,[42] examined data collected as part of the Health Survey for England (HSE) between the years 1996 and 2006. They looked at data which highlighted: the salivary cotinine concentrations for non-smoking children aged 4-15 years; parent/carer smoking status; and existence and extent of home smoking restrictions. A similar trend was seen to the aforementioned Jarvis et al. 2000 study, whereby there was an observed decline in the mean cotinine concentrations by roughly a half between 1996 and 2006 with average levels falling from 0.59ng/ml to 0.24ng/ml.[42] In this study, the largest declines in cotinine concentration levels were seen for those children who were reported at the outset as being most exposed to SHSe.[42] The authors of this study also noted the largest decline occurred between the years of 2005 and 2006, just prior to the implementation of smoke-free legislation in England (on 1st July 2007).[42] It has been hypothesised that this decrease was caused by changed smoking behaviours as part of general societal changes. These legislative changes occurred in response to an increased emphasis on the need to better protect citizens from the dangers associated with smoking and SHSe supporting the introduction of nationwide legislation.[39,42] Furthermore, this study highlighted the impact of health inequalities on the levels of SHSe for children, with those from a more deprived home being at higher risk of SHSe (see Section 1.3.4 for further discussion of inequalities and risk of SHSe). HSE data were also analysed by Jarvis et al.,[39] from the years 1996-2007. This study

reported a decrease in children's mean cotinine levels (0.29ng/ml to 0.10ng/ml for children with non-smoking parents; and 1.81ng/ml to 1.35ng/ml for those with one smoking parent; and 2.85ng/ml to 2.18ng/ml for those with two smoking parents) following an increase in the uptake of smoke-free home environments.

Upon further examination of 13,327 children participating in the HSE study between 1998 and 2012 by Jarvis et al. [40], there was a 79% decrease in children's exposure to SHS since 1998, where the child was a non-smoker, and their parents (one or both) were cigarette smokers. Using similar methods as in their previous study,[41] the authors reported a decrease in English children's geometric mean cotinine concentrations from 0.52ng/ml in 1998 to 0.11ng/ml in 2012.[40] Moreover, the authors noted that the decline in children's SHSe levels was not linear over this time period: a steeper decline in exposure levels was observed since 2005[40] which confirmed the findings of the studies which ended data collection earlier. This is likely to have coincided with an increase in national campaigning and debate concerning smoking and SHSe prior to the introduction of new smoke-free legislation, as discussed in Section 1.4.

Despite the declines in SHSe seen in the English population since the late 1980s, it is imperative to continue making efforts to protect non-smokers from the detrimental consequences associated with SHSe. It is apparent that those children living in homes which are not smoke-free remain at risk of SHSe in the home as these levels have not changed much over the years. Additionally, there appears within England in inequalities in the burden of SHSe, which should be considered in future public health activities.

1.3.4 Inequalities and risk factors for exposure to secondhand smoke

Numerous risk factors associated with children's risk of exposure to SHS in the home environment have been identified.[4] A recent review summarised these risk factors in five categories:[4] 1) socioeconomic status; 2) family and home characteristics; 3) parental characteristics; 4) parental smoking characteristics, and; 5) child characteristics. The systematic review was able to calculate a range of odds ratios which may include the true effect of the relationship between the risk factor and subsequent SHSe in children (Table 1.5).

Table 1.5 The range of odds ratios describing the association between risk factors and the risk of children's exposure to SHS in the home (data adapted from Orton et al. [4])

Risk factor category		**Risk factor associated with childhood SHSe in the home**	**OR range (1dp)**
(i)	Socioeconomic status	Children of parents in lower socioeconomic groups	1.1 to 3.3
(ii)	Family and home characteristics	Children whose mothers were unmarried or separated or children who were part of a step-family	1.1 to 2.1
(iii)	Family and home characteristics	Children whose parents had the lowest levels of education	1.1 to 10.4
(iv)	Parental smoking characteristics	Children of smoking mothers	2.1 to 6.9

(v)	Child's characteristics	Children of parents who both smoked	2.9 to 13.5

Dp: decimal places; OR: odds ratio

Further primary studies have been conducted since the completion of the Orton et al. systematic review which concurs with the original review findings. Self-reported data collected from middle- and high-school students in the US highlighted three factors which were associated with higher odds for SHSe including: current tobacco use; truant behaviour; and affiliations with household members or friends who use tobacco.[44] Data collected on a sample of hospitalised US children aged 6-10 years who were at risk of SHSe suggested that children of single mothers and children whose mothers had a lower level of education (high school level or lower) were more likely to have urine cotinine levels which evidenced SHSe (OR 1.67; 95%CI 1.03, 2.71 and OR 1.66; 95%CI 1.08, 2.56, respectively).[45] Children's urine cotinine levels also indicated that there was a higher risk of SHSe in cases where mothers were earning less than $2500 per month (OR 2.04; 95%CI 1.11, 3.75) or where fewer than 12 maternal prenatal visits had been attended during the pregnancy (OR 3.40; 95%CI 1.88, 6.18).[45] In contrast, reported increased satisfaction with parenting was associated with lower odds of SHSe for children (OR 0.57; 95%CI 0.36, 0.91).[45] In a recently published cross-sectional study of Spanish households with children under the age of 12 years, a further three factors were highlighted as potentially associated with an increased risk of SHSe.[46] These were: parents' origin(s) (adjusted prevalence ratio (aPR)=2.09 for children with one Spanish parent and one foreign parent); family structure (aPR=1.38 for children who did not

have a two-parent family structure); and lower educational attainment (aPR=1.74 for children with lower education attainment).[46]

This section has highlighted the vulnerable groups who may be at risk of SHSe. Due to variations in risk levels, as well as, population-based approaches aiming to bring down overall rates of SHSe, targeted approaches should be considered focussing on those subgroups of the population who are at the greatest risk.

1.4 Interventions which aim to protect non-smokers from secondhand smoke exposure

As detailed in previous sections, SHSe remains a significant public health burden in the UK. The evidence base suggests that the most significant effects of SHSe are seen in certain subgroups within society, including children from socially and economically disadvantaged groups. As the risk is not only in the immediate term, inequalities can widen if children from at-risk groups take up smoking and develop further negative downstream consequences.

Considering the public health burden, it is of utmost importance to develop, test and implement effective harm reduction interventions to benefit those at risk of SHSe in home environments. As viewpoints differ as to whether health is a collective or individual responsibility,[47] there are consequences in the uptake and success of population-based approaches versus targeted individual-level approaches.[48] On the whole, the UK tends to adopt a widely collective approach to public health matters, whereby a social responsibility doctrine encompasses the use of legislation, regulation, population-wide measures and progressive health service funding to target populations at risk.[47] Due to the global health

importance of SHSe many population-based and targeted interventions have been trialled and are discussed in this section.

1.4.1 Legislation protecting non-smokers from SHSe

A widely used population-based approach aiming to reduce SHSe is the introduction of smoke-free legislation. In 2003, the WHO issued its first treaty, the Framework Convention for Tobacco Control (FCTC), to their member states and parties.[49] As part of section 8 of this FCTC policymakers were instructed to:

"Adopt and implement in areas of existing national jurisdiction as determined by national law and actively promote at other jurisdictional levels the adoption and implementation of effective legislative, executive, administrative and/or other measures, providing for protection from exposure to tobacco smoke in indoor workplaces, public transport, indoor public places and, as appropriate, other public places." [1]

In addition to this, the WHO issued policy recommendations in 2007 to promote the "Protection from exposure to secondhand tobacco smoke".[1] Box 1.1 outlines the recommendations listed by the WHO.

Box 1.1 WHO Recommendations to promote the "Protection from exposure to secondhand tobacco smoke" (adapted from Oberg et al. [1])

1. Remove the pollutant – tobacco smoke – by implementing 100% smoke-free environments. This is the only effective strategy to reduce exposure to tobacco smoke to safe levels in indoor environments and to provide an acceptable level of protection from the dangers of SHS exposure. Ventilation and smoking areas, whether separately ventilated from non-smoking areas or not, do not reduce exposure to a safe level of risk and are not recommended;

2. Enact legislation requiring all indoor workplaces and public places to be 100% smoke-free environments. Laws should ensure universal and equal protection for all. Voluntary policies are not an acceptable response to protection. Under some circumstances, the principle of universal, effective protection may require specific quasi-outdoor and outdoor workplaces to be smoke-free;

3. Implement and enforce the law. Passing smoke-free legislation is not enough. Its proper implementation and adequate enforcement require relatively small but critical efforts and means;

4. Implement educational strategies to reduce SHS exposure in the home, recognising that smoke-free workplace legislation increases the likelihood that people (both smokers and non-smokers) will voluntarily make their homes smoke-free.

Many countries have responded to these policy recommendations with the introduction of legislation to encourage smoke-free environments and promote reductions in the prevalence of tobacco smoking.[1] The countries within the UK have also acted in response to this guidance, and those legislative changes made specifically in England are detailed below.

Since the late 1990s, English governments have been introducing legislation to protect citizens from the effects of smoking and SHSe. These legislative changes have been associated with a decline in prevalence.[50] Some key changes in the UK which contributed to these changes included: 1) The 1998 White Paper "Smoking kills" and subsequent funding for smoking cessation programmes; 2) Banning of large scale tobacco advertisements in 2003; 3) Prohibition of smoking in workplaces and enclosed public spaces in 2007; 4) an

increase in the legal minimum age to buy tobacco products in 2007; 5) Banning of point of sale retail tobacco displays in 2012 and 2015; and 6) Banning smoking in cars with children in 2015.[50,51] The most recent tobacco control plan was published by the English government in 2017 named, "Towards a smoke-free generation: a tobacco control plan" which outlines a five-year plan to protect citizens from the harms associated with tobacco smoking (included SHSe). [50,52] The UK government have outlined this most recent tobacco control plan in an attempt to work towards achieving: the first smoke-free generation; smoke-free pregnancies, parity of esteem for those who have been diagnosed mental ill-health; and evidence-based innovations to support smoking cessation.[53] The five-year plan has outlined targets to be achieved by the year 2022, which will carry the UK closer to these overall aims. For example, by 2022 the government aim to achieve a reduction in smoking prevalence amongst English adults from 15.5% to 12.0% or less and a reduction in the prevalence of smoking during pregnancy from 10.7% to 6.0% or less.[53]

Although the effects of legislative changes appear extensive and wide-reaching, the literature surmising the evidence of changes to SHSe resulting from the implementation of legislative changes is not definitive. An analysis of data from 10,825 children collected as part of the HSE showed a higher proportion of children, who had smoking parents, lived in a smoke-free home (SFH) following the introduction of legislation (35.5% in 2006 compared to 48.1% in 2008).[54] In this study, the authors observed a decrease in the geometric mean cotinine concentrations for children from 0.24ng/ml in 2006 to 0.21ng/ml in 2008.[54] Despite not being large reductions, these results dispelled concerns that the introduction of smoke-free legislation would result in increased smoking in home environments and a subsequent increase in SHSe.[54] Conversely, a 2012 study found no significant changes in children's

cotinine concentrations in comparison to the levels that would be expected without the introduction of these legislative changes (OR 0.98; CI 0.62, 1.5 for children from mostly non-smoking homes; and OR 1.1; CI 0.75, 1.6 for children living with one or more smokers).[55]

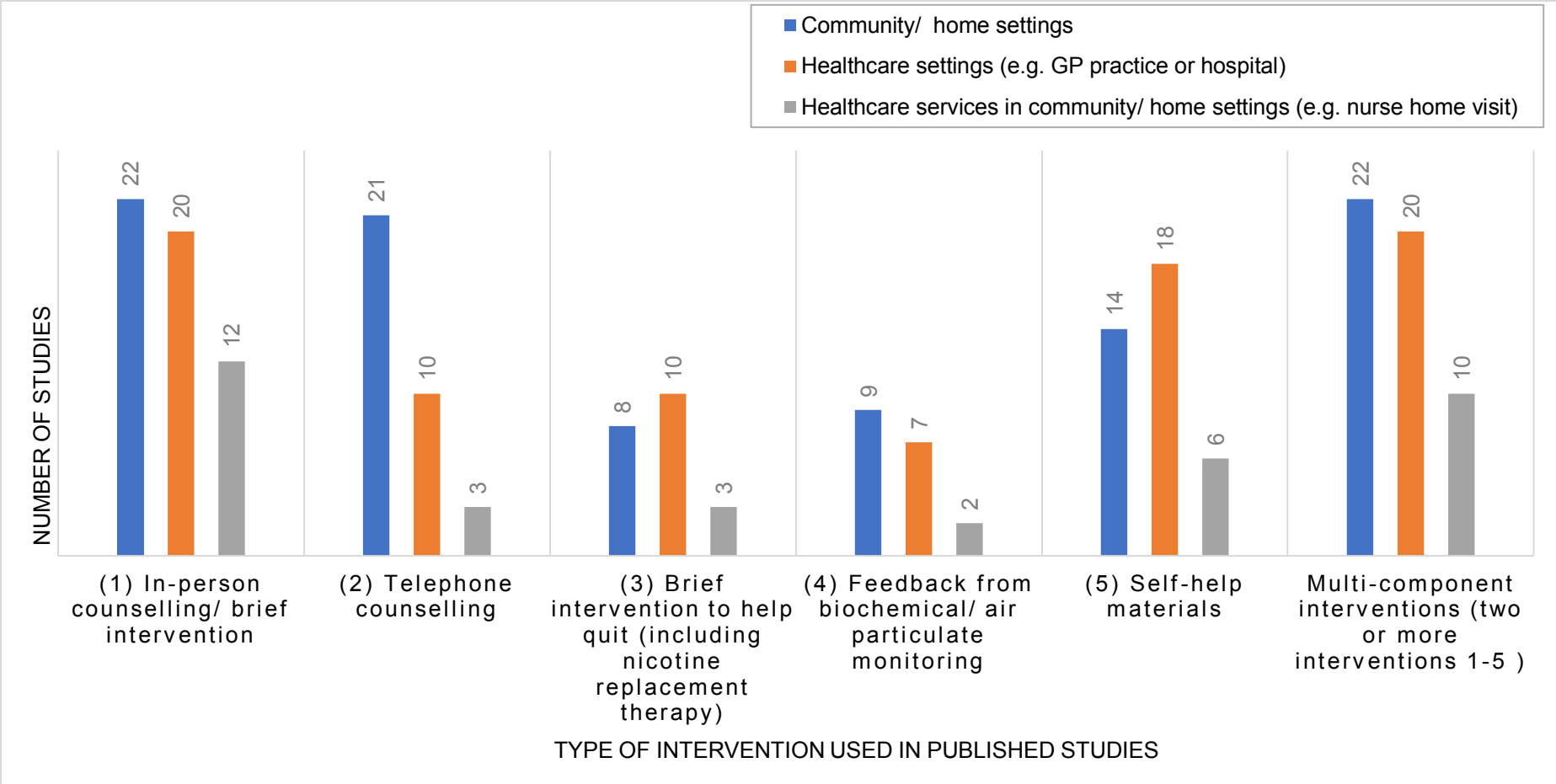
Although legislative changes (such as, the introduction of increasingly restrictive smoke-free legislation in England) have the potential to have a positive effect using a universal population-based approach, there are limitations with this method of intervention for the promotion of health.[48] Firstly, population-based approaches including legislative changes may have unintended consequences beyond the issue that was intended to be addressed.[47] The existing evidence suggests no clear rise in SHSe in home settings subsequent to the introduction of smoke-free legislation for public spaces.[54–56] We cannot draw from English population data from the same sources as the aforementioned studies (i.e. HSE data) as this is no longer available in the academic domain and therefore cannot be used to ascertain the true long-term effect of this legislative change on the SHSe levels for non-smokers in homes.

1.4.2 Targeted approaches to support the reduction of non-smokers' exposure to SHS

In contrast to population-based approaches to health promotion as seen through the introduction of legislation, targeted approaches, typically focussing on those most at risk, to health promotion are often also useful as they offer tailored messages and prioritised use of resources whilst also allowing patients to have more authority over their uptake and level of involvement in health promotion activities.[47] When examining SHSe interventions, it is clear that the majority of those designed have been developed using a targeted approach. Two relatively recent systemic reviews and meta-analyses have provided a summary of the current literature (including a total of 77 unique studies across both reviews) examining

interventions to reduce SHSe for non-smokers.[57,58] Table 1.6 outlines the settings and approaches adopted by studies which evaluated the effectiveness of targeted approaches for SHSe reduction. The approaches have also been summarised in Figure 1.4 using six broad categories of intervention approaches to describe study intervention components: 1) in-person counselling/brief intervention; 2) telephone counselling; 3) brief intervention to help quit including nicotine replacement therapy; 4) feedback from biochemical/air particulate monitoring; 5) self-help materials, and; 6) multicomponent interventions (where two or more components were used for the study intervention).

Figure 1.4 A summary of the targeted approaches settings and intervention types used in 77 published randomised controlled trials which aimed to reduce SHSe for non-smokers (data adapted from Behbod et al. and Rosen et al. [57,58])



As shown in figure 1.4, the delivery of interventions in community/home settings or in healthcare settings were the most common formats, with fewer interventions being trialled which used healthcare services in community/home settings, in comparison. Interventions that incorporated a counselling option (whether in-person or via telephone) were the most commonly delivered in community/home settings. A large proportion of the in-person counselling interventions were also delivered in healthcare settings. The use of brief interventions to encourage quitting, as well as the use of feedback from SHSe monitoring were the least common types of interventions used across the delivery settings. A large number of studies identified in these systematic reviews[57,58] used multicomponent approaches where self-help materials were given in conjunction with the intervention.[57,58]

It was clear in the reviews that of all the approaches attempted, only a minority of interventions or combination of interventions were able to demonstrate effectiveness in reducing non-smokers SHSe.[57,58] Although the targeted approaches have shown little to nil benefit (Rosen evidenced that 7% more children were protected in intervention groups relative to control groups, showing a 7% benefit[58]), further understanding of possible reasons as to why need to be understood. Firstly, the reviews highlighted methodological limitations with the quality of evidence ranging from low to very low suggesting that outcome and exposure measures were poorly recorded, sample sizes were low and follow up was too short for noticeable changes. Additionally, as many of the approaches were implemented in HICs and some at a cost to the patient, considering the socioeconomic factors which play a role in the risk of SHSe, the current interventions may not be transferable to other settings, such as specific areas in the UK. More research is required to inform our understanding of what solutions could potentially work to reduce SHSe. Further

details of intervention components and their effectiveness are discussed in relation to primary care interventions in Section 1.4.3 as this is of particular relevance to the overarching research aim.

Although the current evidence is insufficient to identify an intervention approach which would be effective in reducing non-smokers' SHSe, there is some evidence to indicate that multicomponent interventions have more success than single-arm interventions. Recently published studies investigating the efficacy of a SHSe intervention have opted for complex multicomponent approaches for their intervention of study.[59–61]

1.4.3 Primary care opportunities for intervention

Unique features of the UK health landscape include the public-privately funded healthcare partnership, and the integration between primary care and public health.[62] As a result, primary care within the UK has the opportunity for implementation of both population-based and targeted health promotion interventions. Of existing interventions highlighted in the reviews (noted in Table 1.6) many (n=33) made use of primary care settings and in some cases used primary care-based healthcare professionals (HCPs) in the identification of participants and/or intervention delivery. On examination of these published studies, there was not enough evidence to indicate which of the suggested trial components had the potential to work towards the development of a successful SHSe-related intervention. Considering the ability primary care may hold in the delivery of SHSe interventions, it must be explored as a potential avenue for further SHSe health promotion activities. The potential involvement of primary care in the delivery of SHS harm reduction is outlined below.

1.4.3.1 Definition of primary care

Prior to exploring potential involvement, it is important to define primary care. In the WHO alma mater declaration, primary healthcare was defined as:

> *"Primary health care is 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, and constitutes the first element of a continuing health care process."* [63]

Across the world, the level to which primary care services have met this definition is variable.[64] Many HICs within the European region, such as the UK, have actually surpassed this definition as their services often include preventative, curative and rehabilitative services which aim to integrate all aspects of healthcare service provision.[64]

Terms often synonymous with primary healthcare include: general practice, family medicine, primary care teams or primary care.[65] As a general practitioner covers all of the roles of primary care providers they are often seen as covering primary care; however, as described by the WHO when defining family medicine or primary care teams, there are many other HCPs who make up the multidisciplinary team within the primary healthcare system.[64] In the UK these may include dentists, opticians, pharmacists, nursing staff, health visitors and many others.[66]

1.4.3.2 Potential opportunities to deliver secondhand smoke harm reduction interventions

Due to the extensive public health burden described previously, primary care HCPs are likely to encounter patients who present with illnesses that are as a direct or indirect consequence of their SHSe or active smoking behaviours.[67] As seen in the current literature (see Section 1.4.3.3) interventions to reduce SHSe may be delivered to smokers themselves to effect changes to home smoking behaviours or to the smokers around non-smokers who are the identified patient. HCPs in UK primary care settings are recommended to ask patients about smoking behaviours when taking patient histories[68] They are, therefore, potentially uniquely placed to counsel patients and their families to promote the reduction of SHSe. As identified by Khoo et al. in 2008[69], general practitioners and pharmacists are the most trusted sources of information by parents consulting for information about their children's health. Thus, it is reasonable to suggest that these primary care HCPs roles' may be opportunely positioned to have an impact on parents smoking behaviours. In addition to providing SHSe harm reduction interventions during patient-initiated consultations, primary care HCPs often interact with patients who might be at risk of SHSe during planned routine appointments, such as children's routine developmental check-ups or immunisation appointments, or adults' annual asthma clinic review appointments or medication review appointments. These present further potential opportunities for primary care HCPs to promote the reduction of patients' SHSe.

A study conducted in the US that analysed electronic health records as documented by paediatricians in primary care practices found that parental tobacco use was recorded for 23.2% of adolescent patients.[70] Similarly, SHSe in the home was recorded for 33.1% of visits by the adolescent patient group.[70] This indicates that primary care-based paediatricians may

have opportunities and resources to be able to investigate and record patients' exposure levels to SHSe improving surveillance and identification of opportunities for intervention. In the UK, guidance has been issued by Public Health England (PHE) in the format of the 'Making Every Contact Count' (MECC) framework, to encourage all members of health organisations to work to promote the health of individuals at every opportunity[71,72]. Under this guidance, primary care HCPs may, therefore, be in a position to utilise any type of consultation to promote SHSe reduction, regardless of the original topic being discussed[71,72]. Considering the vast array of opportunities, there is a clear need to understand whether the role of primary care HCPs has been evaluated carefully when it comes to SHSe. Research is needed to understand the acceptability and feasibility of utilising primary care consultations for the delivery of SHSe interventions in routine practice. There is current evidence to suggest that less than a third of HCPs employed in the UK's NHS are aware of the MECC policy and only 50% of HCPs typically deliver an intervention following an identified need.[73]

1.4.3.3 Existing interventions based in primary care settings

Currently, harm reduction and smoking cessation guidance has been issued for use by primary care HCPs in England.[74–77] Asking about a patient's smoking status has become an incentivised practice in primary care as part of the 'Quality and Outcomes Framework.'[78] This has, in some instances, been evidenced to increase documentation of patients' smoking status in primary care records.[79] No such incentivisation or specific recording systems exist for SHSe. The use of this question to ascertain a patient's smoking status offers a potential pathway to then deliver smoking cessation advice. It is apparent that the delivery of brief advice to adult smokers attending clinical services for their health positively impacts the initiation of quit attempts.[80] It is unknown if this principle could be applied and effective for

reducing SHSe in cases where smoking cessation is established not to be a feasible option. However, in recognition of the need to achieve smoking cessation in the first instance, there may be potential for introducing SHS-focussed brief advice if the options for cessation is refused or unsuccessful.

When considering the potential for asking practices around SHSe to be introduced, asking practices can already be used to identify active smoking, it is important to understand the different levels of intervention involvement. Asking only constitutes one element of intervention by identifying the relevant population who could benefit from further interventions being delivered. Commonly advocated interventions for active smoking known as the 5As (Ask, Advise, Assess, Assist, Arrange)[81] or 3As (Ask, Advise, Act)[82] of brief intervention both start with this fundamental element of asking patients about the smoking behaviours or risk of SHSe. Follow-up once the relevant patients have been identified would involve some form of advice delivery and action taken to support behaviour changes promoting health and harm reduction. Should asking practices be implemented, mechanisms of further intervention to effect changes in SHSe should also be explored and used as they have been for smoking cessation as asking alone may not lead to follow-up of support for SHSe reduction.[83]

Many targeted approaches have been attempted using primary care settings as a site for delivery of SHS-focussed interventions.[57] However, there is currently no primary care-based intervention with demonstrable effectiveness in reducing SHSe for non-smokers.[57] The majority of the studies which looked at this were not conducted in the UK and therefore, involved a different healthcare structure; the results may therefore not be transferable to

the UK context. Research exploring the UK primary care structures is required to establish the opportunity for the delivery of SHSe interventions in this setting. A summary of those interventions which have been explored is outlined in Table 1.6 to illustrate the point of the primary care involvement in current literature as well as the intervention types adopted.

Thirty-three studies were identified, of which 27 recruited participants from a primary care setting (8 of these were identified by a primary care-based HCP) and 14 had an intervention delivered in a primary care setting, and 24 by a primary care practitioner. Of these 33 studies, 15 opted for a single component intervention, whereas 18 trialled a multicomponent intervention. In total, 15 studies involved delivering self-help materials, 23 used in-person counselling/brief intervention, 13 used telephone counselling, 7 used a brief intervention to help quit smoking and 7 used feedback mechanisms for their chosen study interventions.

The intervention components identified above are all focused on reducing levels of SHSe. Similar intervention components have also previously been explored and trialled for their use in promoting smoking cessation using primary care settings. A systematic review identified some promising intervention components for smoking cessation in primary care settings: adjunct counselling for smokers, counselling prompts for HCPs, and performance feedback for HCPs; however, none of these single intervention strategies have been shown to be significantly effective when used alone.[84] Brief intervention from physicians has been evidenced to have a small effect on cessation rates.[80] Multicomponent interventions have been evidenced to improve active smoking-related outcomes in primary care.[84] Thus, there may also be potential for multicomponent interventions to be effective in promoting SHSe

harm reduction from primary care settings. The use of self-help materials in conjunction with counselling (such as brief advice) from a HCP has been demonstrated to be successful in promoting smoking cessation.[85]

As shown in Table 1.6, the evidence regarding intervention strategies applied for the promotion of SHSe harm reduction is inconclusive to date. The intervention strategies currently explored encompass a mixture single and multicomponent interventions.

Table 1.6: A table summarising the components and effects of published randomised controlled trials for SHS-related interventions with a primary care element

Study	Subject at risk of SHSe	Primary care involvement				Type of Intervention					Effect of intervention on SHSe to the identified subject at risk
		Participants identification		Interventions delivery							
		In a primary	By a primary care HCP?	In a primary care setting?	By a primary care HCP?	Self-help materials	In-person counselling / brief intervention	Telephone counselling	Brief intervention to help quit (including nicotine replacement therapy)	Feedback from biochemical/ air particulate	
Abdullah[86]	Children	Yes	No	Unclear	Yes		X				Higher proportion adopted smoking restrictions at home and the total 7day exposure from all smokers indoor and outdoor was significantly lower in the intervention group

Pollak[87]	Expectant mothers	Yes	Yes	No	No	X	X	X	X		No measure was given for mother's SHSe levels
Schonberger[88]	Children	Yes	Yes	No	Yes		X				No measure was given for children's SHSe levels
Walker[89]	Infants	Yes	Yes	Yes	Yes		X				No significant effect
Yucel[90]	Children	Yes	No	No	No	X	X	X		X	No evidence of effect
Wilson[91]	Children	Yes	No	No	No		X	X		X	No significant effect
Conway[92]	Infants and Children	No	No	No	Yes		X	X			No significant effect
Harutyunyan[93]	Children	Yes	No	No	No	X	X	X			No significant effect

Kegler[94]	Children	Yes	No	No	No	X		X			Intervention group significantly more likely to successfully have and enforce a smoke-free home rule at 3months and 6months
Zakarian[95]	Children	Yes	No	Yes	Yes		X	X		X	No evidence of effect
Ortega[96]	Neonates and Infants	Yes	Yes	Yes	Yes		X				Home and car strategies to reduce SHSe improved significantly more in the intervention group
Severson[97]	Neonates	Yes	Yes	Yes	Yes	X	X				No measure was given for children's SHSe levels
Tyc[98]	Children with cancer	Yes	No	No	No		X				No evidence of effect
Curry[99]	Children	Yes	No	Yes	Yes	X	X	X			No measure was given for children's SHSe levels

Eriksen[100]	Infants and Children	Yes	Unclear	Yes	Yes		X				No evidence of effect
Fossum[101]	Neonates	Yes	Yes	Yes	Yes		X				Mean cotinine level reduced from 185ng/ml to 165ng/ml in the intervention group, whereas it increased from 245ng/ml to 346ng/ml in the control group
Vineis[102]	Neonates and Infants	Yes	No	Yes	Yes	X	X				No measure was given for children's SHSe levels
Hughes[103]	Children	Yes	Unclear	Yes	Yes	X	X		X		No evidence of effect
Kallio[104]	Infants	Yes	Unclear	Yes	Yes	X	X				No significant effect
Abdullah[105]	Neonates and Infants	Yes	No	No	No	X		X			No measure was given for children's SHSe or cotinine levels

Baheiraei[106]	Infants	Yes	No	No	No			X			Significantly larger decrease in the cotinine levels recorded from the intervention group after 3 months
Chilmonczyk[107]	Infants	Yes	Yes	No	Yes	X		X		X	No evidence of effect
Joseph[108]	Infants	Yes	No	Yes	No			X	X	X	No significant effect
Nuesslein[109]	Children	Yes	No	Yes	Yes	X			X	X	No evidence of effect
Van't Hof[110]	Neonates and Infants	No	No	Yes	Yes				X		No measure was given for children's SHSe levels
Hafkampf-de-Groen[111]	Infants and Children	Yes	No	Yes	Yes	X					No significant effect
Armstrong[112]	Neonates and Infants	No	No	No	Yes		X				No measure was given for children's SHSe levels

Wiggins[113]	Infants and Children	No	No	No	Yes		X				No significant effect
Culp[114]	Neonates and Infants	Yes	No	No	Yes		X				No measure was given for children's SHSe levels. Also, no significant difference in the number of hospital visits/ admissions
Emmons[115]	Infants	Yes	Yes	No	Yes	X	X	X		X	No significant effect
Krieger[116]	Children	No	No	No	Yes		X				No measure was given for children's SHSe levels
Irvine[117]	Children	Yes	No	No	Yes	X			X		No evidence of effect
Winickoff[118]	Neonates and Infants	No	No	No	Yes				X		No measure was given for children's SHSe levels

HCP: Health care professional; SHSe: Secondhand smoke exposure

Table 1.6 highlights the little to no effect of currently assessed interventions in primary care to reduce the SHSe of non-smokers (only 5 of the 33 studies identified evidenced some positive outcome from the intervention). Those primary care interventions which typically evidenced some effect on reducing SHSe for non-smokers often involved the delivery of counselling (either in-person or via telephone).[86,94,96,101,106]

The current literature around intervention components to reduce SHSe, as summarised in Table 1.6, highlighted the limited number of studies which explore the delivery of SHS-related interventions involving primary care settings. Many of these studies did not report the findings for outcomes which would indicate whether the tested intervention was significantly effective to reduce the SHSe for non-smokers (i.e. in cases where the intervention was targeted at the smoker).

Further detail of the individual intervention components as identified in Table 1.6 and their suggested usefulness for future interventions are briefly outlined below:

Self-help materials were only delivered as a single intervention in 1 of the 15 studies which included this intervention strategy. In most cases this strategy was only delivered as part of a multi-intervention approach. Only 1 of the studies which used self-help materials showed evidence of some significant effect in reducing SHSe. It is therefore, unclear whether this format may prove useful to incorporate into future SHSe harm reduction messages delivered in primary care settings.

Eighteen of the 23 studies which involved in-person counselling or brief intervention delivery to effect SHS intervention used a primary care-based HCP to deliver this intervention. It is currently inconclusive as to whether there is added benefit from using a primary care HCP

over another counsellor to deliver this intervention, given the findings summarised in table 1.6: the evidence is limited and needs to be strengthened before association studies can investigate this any further. Three of these 23 studies showed some significant effect benefiting the intervention group. All three of these involved single interventions. However, it should be noted that a further 6 studies which deliver this format of intervention as a single intervention did not report significant findings. The use of in-person counselling/ brief intervention to promote SHS harm reduction in primary care settings should be researched further to explore whether this may be an effective and feasible intervention to deliver in the future.

Only 2 of the 13 studies which used telephone counselling in their SHSe intervention showed benefit to the intervention group. Both of these studies used primary care settings to identify study participants but that was the extent of the level of involvement of primary care in these two interventions. It is possible that telephone counselling may show promise if used in a future SHSe-related intervention, although further evidence is required before such a conclusion can be decided.

Seven studies incorporated an intervention involving a brief intervention aiming to help a smoker to quit in order to reduce SHSe-related harms. Of these, 4 studies showed no significant effect in the findings and 3 did not report the relevant results to allow any conclusions to be drawn. Furthermore, there was a range of levels of primary care involvement in these seven studies. Overall, it is unclear whether offering a brief quit intervention using primary care settings/ service providers might be beneficial as part of a future SHS intervention.

There were again 7 studies which used biochemical/ air pollution feedback in their SHSe-related intervention. None of these studies showed significant effects regardless of the level of primary care involvement in the intervention delivery. Thus, this strategy is unlikely to be carried forward into future SHSe harm reduction interventions.

In summary the use of self-help materials, in-person counselling/brief intervention, and telephone counselling have shown some promise when delivered in primary care settings. However, when synthesised the literature remains inconclusive. Therefore, research is needed to successfully identify effective intervention strategies which will promote reductions in SHSe.

Furthermore, as highlighted as a limitation with existing studies, the relationship between HCPs and the children and their smoking parents is unknown (for example, the differences in outcome effect is unknown if the intervention was delivered by the family GP versus delivered by a nurse on a home visit who has not met the family before). Furthermore, the influence this relationship may have on the delivery of interventions to help protect children from SHSe at home is also unknown and has the potential to lead to negative consequences. Previous studies have shown consistently that most parents believe it is the role of their child's healthcare professional to intervene and offer smoking cessation advice and most would welcome such advice.[119–121] Limitations caused by poor outcome measurements or reporting may also influence the lack of knowledge gained from existing studies in relation to SHS harm reduction interventions. The limited samples reflective of UK healthcare systems (2 of the 33 identified studies were conducted in the UK)[113,117] also prevent the application of the current knowledge to the design of any future intervention to be delivered in UK primary care settings.

A deeper understanding is needed to explore the knowledge and practices of primary care-based HCPs in relation to SHSe, as well as, exploring the factors which influence HCPs' practising behaviours, needs to be studied before an evidence-based SHS harm reduction intervention can be designed in the future. The viewpoints of primary care-based HCPs and primary care service users need to be explored to ascertain the acceptability and suggest recommendations for any such intervention.

1.5 Rationale for this thesis

1.5.1 Rationale

Within this chapter, I have been able to critically reflect on the public health burden of SHSe and the urgent need for effective and sustainable interventions. It is clear that SHSe affects many individuals globally and within England, it appears to have a significant impact on mortality and morbidity, and a high societal cost. Additionally, although there are limitations in the measurement of the prevalence of SHSe, it is still evident that rates within the UK are not improving at a rate which the Government would hope for. After examining possible interventions, it is clear that limited literature exists relating to the efficacy of legislation on all at-risk groups, and where targeted interventions exist, their efficacy is low to negligible.

A potential opportunity is apparent as a result of the unique position of primary care in the emerging UK health promotion landscape. Due to its freely accessible nature, which can cater for hard to reach groups and often takes a family-based approach, primary care naturally appears to be an appropriate setting for effective SHSe harm reduction intervention(s). However, to date, no effective interventions have been identified for use in

UK primary care. Due to the scarcity of literature within this setting, it is also not clear as to how an intervention could be appropriately implemented within this setting. Therefore, this thesis aimed to conduct novel research to explore whether primary care may be a suitable setting to deliver SHS harm reduction interventions. The thesis specific aims and objectives are described below.

1.5.2 Aim

The aim of this PhD thesis was to explore the current and potential use of UK primary care settings for the delivery of SHS harm reduction interventions, in cases where smoking cessation is not a viable option.

1.5.3 Objectives

The following objectives were defined to achieve the thesis aim:

A. To ascertain the level of, and perceptions of, primary care-based HCPs' knowledge and skillset regarding SHSe interventions
B. To identify the current practices of HCPs working in primary care settings, in relation to SHSe
C. To explore beliefs, experiences and influencing factors which affect the current and potential delivery (and/or receipt) of SHS harm reduction interventions in primary care settings, from the perspectives of HCPs and service users
D. To identify approaches that UK healthcare professionals in primary care can use to deliver SHS harm reduction interventions.

1.5.4 Thesis structure

Chapter 1 of the thesis has outlined the current evidence base in relation to SHS, SHSe, harm reduction interventions and primary care services and clearly articulates the need to explore whether UK primary care is an appropriate setting for the delivery of SHS harm reduction interventions. The aim and objectives for this thesis have also been specified in Chapter 1.

Chapter 2 outlines the methodological approach that has been used to complete the thesis aim and illustrates how this approach has influenced the associated research study design, method and interpretation of the findings.

Chapter 3 presents a mixed-methods systematic review published in Nicotine and Tobacco Research in 2018[122]. The existing literature was systematically reviewed to ascertain primary care-based HCPs' knowledge, beliefs and experiences, and the factors influencing practices concerning SHSe. This review addressed thesis objectives A, B, and C as reported in global literature. Updated search results have also been presented in this chapter.

Chapter 4 presents a primary online survey study. This survey built on the results from Chapter 3 and assessed current practices amongst UK primary care-based HCPs, in relation to the delivering SHSe interventions. The survey also investigated HCPs' opinions and experiences which might affect behaviours determining SHSe intervention delivery. This study addressed thesis objectives A, B, and C with a UK sample of HCPs.

Chapter 5 presents a primary qualitative study exploring the delivery of SHSe interventions from the perspectives of both HCPs working in primary care and from smokers accessing primary care services (service users). This study addressed thesis objectives A, B, C, and D, from a West Midlands-based sample.

Chapter 6 presents an integration of the findings from Chapters 4 and 5 in the form of an integrated mixed-methods synthesis. This synthesis answers all of the thesis objectives (A-D) and highlights the similarities and differences seen across the quantitative and qualitative data from the perspective of HCPs.

Chapter 7 presents a summary of the key thesis findings with a discussion to contextualise these findings within the wider literature. The strengths and limitations of each of the studies are also presented and discussed. Additionally, the suggested considerations (as determined in Chapter 5) for intervention delivery in primary care settings are discussed, with suggestions made for the future directions of research to further develop and test these findings. Finally, the implications of this research on future policy and practice are highlighted.

CHAPTER 2:

METHODOLOGY

This chapter discusses the methodology underlying the work of this thesis, including the rationale for the choice of mixed-methods research and the choice of theoretical grounding. Additionally, a reflection on myself as a researcher beginning these research studies is given here.

2.1 Mixed-methods approaches

2.1.1 Definition of mixed-methods research

There are a number of different definitions of “mixed-methods” research in the literature. One definition which has been commonly used to describe mixed-methods broadly explains that:

> *Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone.*[123]

After reviewing the key literature on this topic, [124–131] I would describe "mixed-methods" research from the perspective of this Ph.D. thesis as follows:

> *A research project which comprises of independent quantitative and qualitative elements which are later integrated to inform the overall research project objectives.*

I have compared how I have used “mixed-methods” research with those definitions posed by some of the key researchers in the field. My definition was similar to that outlined by

Tashakorrie and Teddlie in that it required the collection of both quantitative and qualitative data.[128,132] Furthermore, it was similar to Creswell's definition as it involved a separate step in which both datasets were integrated.[133] However, my definition was dissimilar to Bryman's definition[124] as the data were collected in two separate studies, which then formed part of the same project, whereas Bryman had advocated the collection of multiple datasets as part of a singular study.

The processes involved in the data analysis stage (namely, the order of analysis for the separate data types and, whether/how the separate datasets should be integrated) are key elements of the methodological discussion around what constitutes a "mixed-methods" research study.[128] Researchers are generally encouraged to develop study designs that suited their research questions.[134] Research projects, such as this thesis, which involve the separate collection of datasets are said to use "inter-method mixing" (as reasoned later in this Section 2.1).[132] The alternative would involve collecting both quantitative and qualitative data in a single method of data collection, which is known as "intra-method mixing".[132]

The terms "multi-method", "multiple methods" and "multi-strategy" research have also been coined in reference to research projects which involve the generation and analysis of more than one type of data.[127,129] Typically, "multi-methods" rather than the term "mixed-methods" would be used in instances where the same type of data were collected by different methods as part of a single project (i.e., the project involved two separate studies which both collected quantitative datasets using different study designs).[132] It is important to note, "inter-method mixing" would also be different to a "multi-strategy" research project as the latter would not necessarily incorporate an integration stage of data analysis.[132]

Sandelowski et al. (2006) have advocated that a third stage of integration is a necessary step in any mixed-methods synthesis.[135] However, "purists" who believed that quantitative and qualitative data were too different to be transformed often disagree with the use of an integration stage.[135] The level of integration needed to qualify research as being mixed-methods studies has been contested and was thought to be influenced by the theoretical paradigm adopted by the researcher for their studies and subsequent assumptions that the researcher makes when designing their aim and interpreting their findings in answer of this. However, the identification of a paradigm for the conduct of mixed-methods research has also been debated in the literature.[124,128,132,136]

2.1.2 Brief history of the use of mixed-methods research

Mixed-methods research can be used in the context of both empirical research as well as in the review and synthesis of existing literature.[137] The use of more than one type of data to answer research questions has been increasing in popularity since the early 2000s, although mixed-methods research has been in development and use since the 1950s.[138] Key authors in the field of mixed-methods research have since provided guidance on how to practice and apply these methods to empirical research.[137] The guidance on the application of mixed-methods to review and synthesise existing literature is comparatively sparse; however, this too is beginning to become more widely studied and reported.[137] Research pertaining to health services has been shown to be particularly suited to mixed-method research, and increasingly more mixed methods studies are being undertaken in this field.[138]

2.1.3 Strengths of mixed-methods research

Mixed-methods study designs offer researchers the opportunity to combine the strengths of more than one research design and to use the combination of methods to overcome the weaknesses of each individual element,[139,140] in addition to adding meaning to the singular components.[139] For example, the rich and subjective insights that may be generated from qualitative data can be combined with the generalisable and standardised quantitative data to draw conclusions in answer of a broad research aim.[141]

Published strengths of using a mixed-methods approach include:

1. Enabling broader questions to be asked: This use of a combination of data collection methods as part of the overall research design enables researchers to pose and answer broader research questions. When combined, datasets can be used to explore ideas rather than simply testing effects.[139,140] Additionally, mixed-methods facilitates the incorporation of data collected from different stakeholder groups; thereby, aiding the examination and/or exploration of the research objectives from multiple perspectives.[141]
2. Improving generalisability: Using mixed-methods may also increase the generalisability of the results.[139] When rich data is combined with findings from broad datasets that have been collected from a large and representative sample group, the generalisability of the conclusions may be improved.
3. Improving validity: The integration of independent datasets increases the perceived validity of research findings[134]. The external validity of the results are strengthened because combining datasets helps researchers to interrogate the data before

concluding findings.[138] The combination and interrogation of data also help to support researchers' in their interpretation of the data.[138]

4. Strengthening conclusions: The integration of datasets allows for comparison and convergence of the results, which in turn strengthens the conclusions drawn from the data in combination.[139]

2.1.4 Weaknesses of mixed-methods research

The combination of more than one dataset, as required to conduct mixed-methods research, brings with it disadvantages:

1. More resources (e.g., time) needed: can In contrast to a mono-method study, mixed-methods research will involve an extra two research elements in order to answer the overarching research question: one added research element to generate the second dataset and another added element for the integration of the two datasets.[138] This process of including and integrating more than one component of research demands more time and requires a wider range of expertise to assist in the research design and conduct.[138,139] Additional time and funding is often needed to be sought to accommodate the incurred larger resource burden.[138,139]
2. Potential for temporal effects limiting conclusions: It should also be noted that differences in temporality regarding the two datasets have the potential to undermine the integrated interpretation of the findings.[142] Differences in temporality can occur in many respects limiting the study findings, particularly when the datasets are collected reflecting the research objectives at different tie points, thereby making integration of the data difficult and these findings less reliable.

2.1.5 Why have I chosen mixed-methods for this PhD

A mixed-methods study design was useful to answer the thesis' aim for pragmatic reasons,[134] as is further explored when addressing its application in Section 2.1.6.

Primarily, this thesis has explored the use of primary care settings for the delivery of SHS harm reduction interventions. This encompassed using the mixed-methods research findings to explore the possibility of delivering a (current or potential) intervention aiming to instigate behaviour changes in service users, thereby achieving the final outcome of reduced SHSe for non-smokers in home environments. Moreover, this thesis' aim also considered any aspects of behaviour change required on the part of HCPs to be able to deliver an intervention to service users in primary care settings, for the ultimate purpose of supporting reductions in SHSe of non-smokers. As described herein, the pragmatic mixed-methods approach used and described in detail in Section 2.1.6 (in addition to the use of theory as described in Section 2.2) in this thesis was well suited to answering the overarching research aim, achieving its purpose and respective research objectives.

The views of primary care-based HCPs were investigated using both quantitative and qualitative methods. The quantitative data enabled the capture of views from a large and diverse group (across region and specialties) through a method (online survey), which was easy to access and not time-consuming, thus increasing the expected probability of receiving data. As HCPs have been evidenced to be very limited in time,[138] they may be more likely to participate in an online survey for up to ten minutes in comparison to an interview for up to an hour. Capturing the responses of as many HCPs as possible with a cross-sectional survey enabled the opinions of more HCPs to be represented in the data and findings.[140] A

complementing qualitative study was appropriate to independently explore in-depth HCPs' experiences and perspectives, providing richness and context to the HCP viewpoint in relation to the thesis aim. Furthermore, qualitative data collected from service users provided insight from the perspective of intervention recipients. Combined the two sets of qualitative data (from the viewpoints of service providers and service users) could inform suggestions for future intervention recommendations and development.[136]

Therefore, I felt that in the context of my Ph.D. research project, mixed-methods improved the overall project response rates, transferability, and the representativeness of the output following the integration of the two datasets. The survey and interview data supplemented each other: the interview data provided rich data with an in-depth exploration of views and ideas, which supplemented the earlier survey data which offered breadth and context.[124]

2.1.6 How I have selected and applied appropriate mixed-methods for this PhD

A mixed-methods approach was applied to this Ph.D. across four stages. Firstly, a mixed-methods systematic review and synthesis of the existing literature was conducted. Independent and concurrent qualitative and quantitative studies were then conducted after this review. The results of these two empirical research studies were then integrated by triangulation using a convergent design of mixed-method synthesis to integrate and interpret the results (see Section 2.1.6.2).

Creswell (2011) outlines ten advances that should be incorporated into all mixed-methods study irrespective of their chosen approach and design.[143] Table 2.1 outlines how these ten advancement markers have been incorporated into this thesis.

Table 2.1 The ten advances of mixed-methods as outlined by Creswell (2011)[143] and with a justification of how this Ph.D. thesis endeavoured to achieve these advancements in methodology

Ten advancements in mixed methods as summarised by Creswell[143]	**How this has been incorporated into this thesis' research**
Include information about your quantitative, qualitative, and mixed methods skills	A reflexive account has been given in section 2.3.4 of the thesis.
Create study aims for the quantitative, qualitative, and mixed methods components.	The study aims have been outlined in each of the respective thesis chapters (3, 4, 5, and 6)
Write a justification for using mixed-methods.	The rationale for using a mixed-methods research design has been provided in sections 2.1 and 6.1 of the thesis.
Advance a mixed-methods design for your procedure	This has been demonstrated in Chapter 6 of the thesis and reasoned in Chapter 2
Portray this design with a diagram and/or implementation matrix	Diagrams outlining the data integration and data interpretation processes have been provided in Chapter 6 of this thesis. A brief overview of mixed-methods designs also given in this Chapter (Section 2.1.6)
Be specific about your point of integration in your design.	Integration occurred following the initial independent analysis of each of the parallel (concurrent data collection and analysis) research studies and as described in Chapters 2 and 6

Create joint display tables to show integration and draw inferences	See table 6.1 in Chapter 6 of this thesis.
Select a conceptual framework for your project that links into the design	The COM-B model of behaviour change was used to guide the design, conduct, and analysis of the quantitative (Chapter 4) and qualitative studies (Chapter 5) and also provided a structure for the presentation of the results from the mixed methods synthesis (Chapter 6)
Advance mixed-methods validity (research integrity) in your design	The explained rationale and methods used in this mixed methods Ph.D. thesis demonstrate the validity and integrity that has been built into the research design and conduct.
Create multiple publications from your mixed methods project	I endeavour to publish this novel Ph.D. research in academic journals. These publications will hopefully follow the completion and examination of the Ph.D. thesis.

2.1.6.1 Systematic review

A systematic review and synthesis was needed at the first stage to begin this research to examine the existing literature base. This review summarised the knowledge, attitudes, practices, and determinants of practice behaviours among primary care-based HCPs in relation to promoting reductions in SHSe according to the existing global literature. A mixed-methods approach was decided to be the most suitable approach for this review as

synthesising the relevant quantitative and qualitative evidence was believed to provide the most comprehensive answer to this complex review question.[137,140]

The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) develops useful methodology and offers a source of many mixed-methods systematic reviews. Many of their review questions have more commonly been including multiple syntheses to answer increasingly complex questions, often incorporating multiple sub-questions.[137] The systematic review question and aims defined for this Ph.D. were similarly complex and encompassed four sub-questions(as objectives). The EPPI-Centre's demonstration of the appropriateness for this systematic review design and use across varied research fields supported the planned successful application of this thesis' mixed-methods approach to the systematic review.[137]

Prior to conducting the systematic review, it was anticipated that the quantitative data would likely provide evidence for the current practice of HCPs in relation to delivering SHSe interventions, including the quantifying the prevalence of particular HCP's beliefs and other factors concerning HCPs' delivery of SHSe interventions. To complement the quantitative data, the qualitative data were synthesised exploring the reasoning behind practices and to give a deeper understanding of the beliefs and current practices of HCPs in relation to SHSe and related interventions. Ultimately, it was understood from the outset that the ability to capture beliefs and practices would be dependent on the availability of data. Heyvaert et al.(2011) explained that for mixed-methods primary studies, the data types collected for each aspect of the research could be controlled.[144] However, in a mixed-methods synthesis,

the researcher would be limited by the nature of the primary research that already existed within the chosen field for review.[144]

As highlighted by the Joanna Briggs Institute (JBI) in 2014, a well conducted mixed-methods systematic review goes further than simply including quantitative and qualitative data in the same review.[145] An overarching synthesis of all the data would be required. JBI has identified two main approaches to conducting mixed-methods systematic reviews: the realist synthesis[146,147] and the alternative frameworks.[135]

The realist synthesis would require the hypothesis of a theory (intervention) and would entail a highly iterative pathway of analysis that could alter the direction of the study. This approach was unsuitable for the Ph.D. review question, which had been predefined and was not focussed on one particular intervention. Additionally, as the objectives of this review were not necessarily dependent on each other, an iterative process was not preferable. Moreover, the realist synthesis is an approach to reviewing research evidence of complex social interactions.[146,147] It is commonly used to provide and explanatory analysis of how and why these interventions do or do not work in particular contexts or settings.[146,147]

Sandelowski et al. (2006) have offered approaches aligned to the alternative frameworks, which may be used instead of adopting the realist approach to a mixed-methods systematic review and synthesis. These approaches include: segregated, integrated and contingent methods.[135]

Sandelowski's segregated method involves individual analyses of the quantitative and qualitative data before an overall mixed-methods synthesis is then performed.[135] In the synthesis, the two forms of data syntheses are then seen to either complement (or refute)

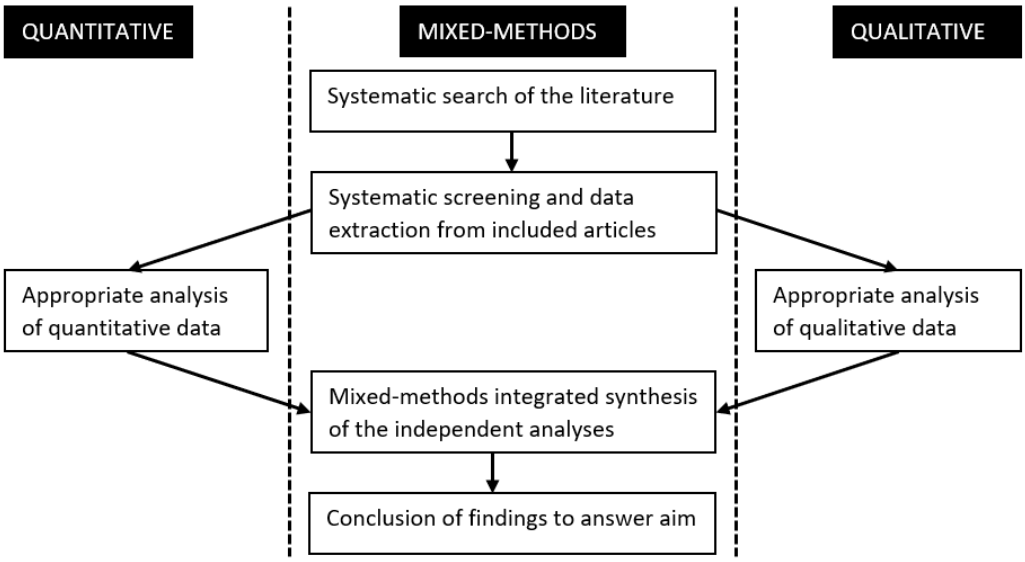
one another.[135] Given the uncertainty regarding the nature of the existing relevant literature and the advanced definition of the review objectives, the segregated method was advantageous in its use of separate analyses before data integration and mixed-methods analysis was completed(ref). It was understood that an overall conclusion encompassing all of the data could be drawn through "the integration of conclusions from the qualitative and quantitative strands" following the initial independent analysis of the datasets.[131] Conducting individual syntheses offered flexibility and ensured that all of the data were analysed in their own right (so no data were overlooked and inadvertently ignored). By undertaking separate analyses of each part of the collected data, the chosen methods attempted to preserve the fidelity of the data and thus enhanced the rigor of this review.[145]

Harden and Thomas(2005) have provided a guide to the segregated method of synthesis for systematic reviews.[137] They advocate employing a statistical meta-analysis for the quantitative data; thematic analysis followed by aggregation of the qualitative data; and finally, both qualitative and statistical analysis of the previous two syntheses.[137]

The other alternative frameworks outlined by Sandelowski (2006), bypass this separate analysis stage for each of the data types.[135] The integrated method combines all of the data and then conducts an overarching analysis, once all of the data are in a format which enables comparisons to be made.[135] However, this method may obscure some of the results, and consequently render some findings less apparent.[135] Similarly, the contingent method combines all of the data (both quantitative and qualitative) and then applies individual types of data synthesis, but this time in an iterative manner.[135] This entails conducting multiple syntheses to answer each of the review objectives; each synthesis should generate a new

question to be analysed until the overarching objective has been achieved. Integrated or segregated designed syntheses can also be used within the contingent method.[145] However, this method was considered to be unnecessarily complex for this Ph.D. systematic review; a segregated design alone was thought to be sufficient to answer the Ph.D. review question.

Figure 2.1 The ordering and elements of quantitative, qualitative, and mixed-methods research involved for the conduct of the systematic review and synthesis



Having opted to use a segregated approach (outlined in Figure 2.1) to the mixed-method systematic review and synthesis, a separate synthesis was conducted as the final data analysis stage which configured and encompassed all of the data by using the 'bottom-up' approach as described by Sandelowski (2012).[148] This approach involved “data-derived” configuration:[148] the observations taken from the collected data drove the development of concepts and the interpretation of the research. The integration of the two syntheses was guided by a Bayesian approach, which allowed the themes generated from cross-sectional

and descriptive quantitative data to be synthesised with the themes identified from the qualitative data. The findings were presented as an overall narrative synthesis. Although this was not considered to be as rigorous as other methods such as meta-analysis,[145] it was appropriate for a segregated-design methodology.[135]

2.1.6.2 Using a mixed-methods approach to synthesise the empirical research elements included in this Ph.D. thesis

The systematic review and synthesis was followed by two empirical research studies. The reasoning for the choice to use mixed-methods in answering this thesis's aim has been outlined above. In this thesis, a convergent method[142] was adopted. This involved concurrent data collection and analysis for the two independent research studies.

As in the case of the mixed-methods systematic review, there were various approaches which could have been adopted for the design and conduct of the mixed-methods synthesis. The method priority (whether one study held dominance or both were equally dominant to answer the thesis aim), the sequence of methods (order in which the studies were conducted), and the point of data integration of the two studies were all important deciding factors in the rationale for choosing the type of mixed-methods approach.[142,149]

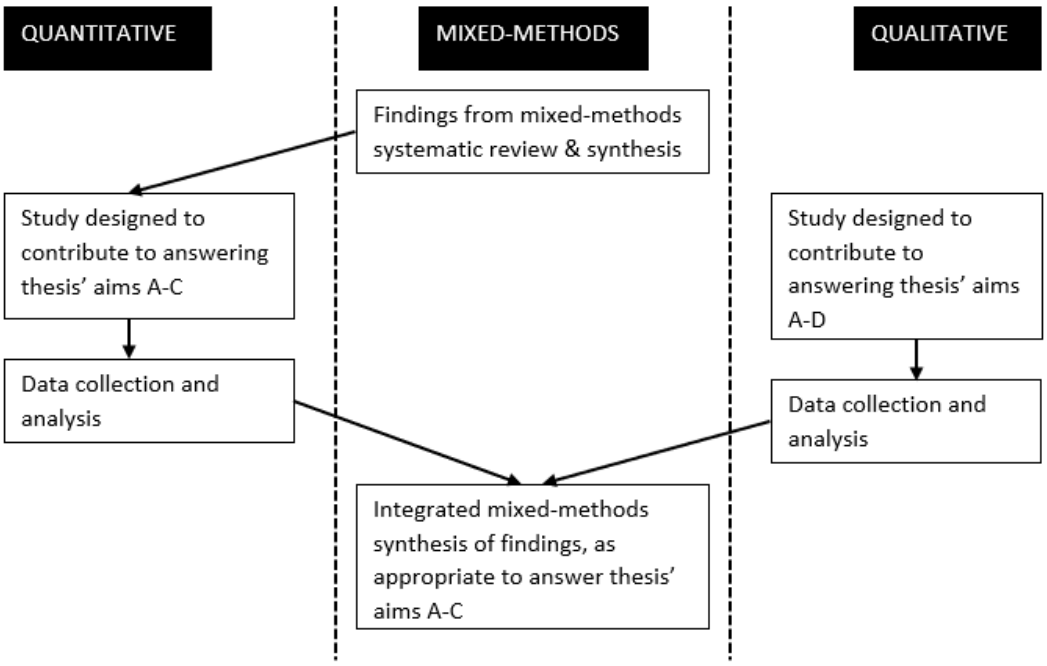
Intention for using mixed-methods is also an important aspect that informs the decision of which approach should be adopted for data synthesis.[142] These intentions consider how the two datasets are going to be used to achieve the research objectives and to justify the use of mixed-methods to achieve these. Five intentions were posed by Greene et al.:[150] triangulation (seeking convergence and corroboration), complementarity (seeking elaboration and clarification), initiation (seeking contradiction and new perspectives),

expansion (seeking to extend the range and breadth of inquiry), and development (seeking to inform or develop the methods).

Since then, Creswell, in collaboration with other researchers, has furthered the field of mixed-methods uses and applications over the past two decades.[123,130,133,142,143,151] Where previously, the term 'concurrent triangulation' would have been applied, later replaced by the term "concurrent parallel", the term 'convergent' is now preferred. This term refers to studies which are integrated with a comment on the level of convergence or divergence of the datasets.[123,142]

Most recently, seven mixed-methods designs have been proposed by Creswell: convergent design, explanatory sequential design, exploratory sequential design, mixed methods experimental design, mixed-methods case study design, mixed methods participatory-social justice design, and mixed methods evaluation design.[142] The justifications made for the use of any of these seven designs differ according to the design chosen.[142] The approach adopted in this thesis is aligned to Creswell's convergent design and is outlined in Figure 2.2.

Figure 2.2 The ordering and elements of quantitative, qualitative, and mixed-methods research (incorporating the empirical research elements) to achieve the thesis' aims



2.2 Theoretical grounding

As expanded in Chapter 1 and further discussed in Section 2.1, this thesis' has explored the use of primary care settings for the delivery of SHS harm reduction interventions. Encompassed within this, was an exploration of the possibility for delivering a (current or potential) intervention, which would instigate behaviour changes in service users (supporting the reduced SHSe levels for non-smokers in home environments), as well as the aspects of behaviour change required on the part of HCPs to be able to deliver such an intervention to service users in primary care settings. A pragmatic worldview was adopted for this research (see Section 2.2.1). The COM-B Model of Behaviour Change was used to theoretically ground this thesis and its research, as described in Section 2.2.3.

2.2.1 Theoretical position

I chose to adopt a pragmatic approach for the empirical research studies which contributed to this thesis. Whilst there exist variations in pragmatic approaches to research, pragmatism is broadly concerned with finding and applying solutions to problems.[140] Thus, the problem or in this case, the research question, becomes the focus of the study rather than the study methods. Pragmatism works well with mixed-methods research projects, which are also problem-focused and are often designed to improve the applicability of research findings into practice.[139] Adopting pragmatism as a worldview for this thesis' research was considered well suited to the thesis' aim and objectives.

Both the pragmatic paradigm and mixed-method study designs enable the optimisation of the use of both quantitative and qualitative research and are, therefore, not limited to any particular theoretical stance in their approach to research. Indeed mixed-methods research is thought to have bolstered the argument for pragmatism as a research paradigm in its own right, thereby rendering the definition of ontological and epistemological perspectives unnecessary.[152] Assumptions regarding axiology are also arguably unnecessary as the principle of value would be inherently explored whilst seeking to define the research question (i.e., the problem which is to be solved by the pragmatic approach).[152]

Neither pragmatic nor mixed methods approaches would assume that the data belong to a single truth. Instead, pragmatism allows researchers to explore the reasons that determine reality and the results of these influences.[139] Pragmatism's "high regard for the reality of and influence of the inner world of human experience in action" and focus on "endors[ing] a strong and practical empiricism as the path to determine what works" supported the

applicability of the pragmatic approach to this particular Ph.D. research project.[139] Thus, it is understandable that pragmatism is the most popular framework chosen for mixed-methods research.[153]

2.2.2 Importance of using theory to underpin research

In recognition of the thesis' aim and objectives, a theory relating to behaviour change was considered appropriate for underpinning the study development, conduct, and analysis.[154]

The definition of a theory as used in this context was *"a set of concepts and/or statements with specification of how phenomena relate to each other".*[154] The use of a theoretical underpinning in this thesis, enhanced the validity and reliability of the findings by providing a comparable structure to guide each stage of the Ph.D. research and to shape the study designs from a singular perspective, thereby enhancing the integrated synthesis of the findings.[155,156]

It was important to identify an appropriate theory in advance to ensure the rigour of the chosen methods and strengthen the credibility of the study findings.[155,156] This was of particular importance to the qualitative component of this research project. Qualitative research is generally interpretative[157] by nature and is consequently at risk of being subjectively variable. However, it should be noted that theories are often not identified in advance for qualitative studies.[155,158] The theoretical framework was transferable to the quantitative research component. This transfer of the same perspective used to design the study and analyse the results maximised the benefits of using a mixed-methods synthesis of the two sets of empirical research findings to contribute to the overall Ph.D. project objective.[155,159]

2.2.3 COM-B model

2.2.3.1 What is the COM-B model?

The COM-B model of behaviour change was identified and selected as the underpinning theory for this thesis's empirical research.[160] This model was developed by Michie et al. (2011), a team of psychologists and health service researchers, as part of a wider behaviour-change intervention development system known as the 'Behaviour Change Wheel'.[161] The COM-B model arose following synthesis of existing behaviour change theories, which highlighted that behaviours (B) were influenced by three factors: capability (C), opportunity (O), and motivation (M).[162,163] These three conditions (COM) are necessary to result in a change in behaviour and are, therefore, important to explore and understand.[164] The components of this model can interact to promote or inhibit behaviour display.[164] Motivation to undertake a task can be influenced by an individual's level of capability or the presence of an opportunity to potentiate that particular behaviour.[164] The display of a particular behaviour may then feedback to influence the individual's capability, opportunity, and/or motivation further.[164] Ultimately, Michie et al. (2014) have explained that in order for a particular behaviour to occur, a person must have the required knowledge and skillset (psychological and physical capability) to enact the behaviour; their physical and social surroundings must offer them the chance (physical and social opportunity) to carry out the behaviour, and; they need to choose (both automatically and after conscious reflection) to display that behaviour over the alternative options (i.e., to have a greater automatic and reflective motivation for that particular behaviour).[164]

This model is considered well suited to studies that aim to explore the development and/or implementation of behaviour change interventions and has been successfully applied in

healthcare settings in the past; it was, therefore, an appropriate choice for this thesis' research.[162,165]

2.2.3.2 How was the COM-B model developed?

Michie et al. (2014) systematically identified all of the existing theories pertaining to the field of behaviour change. They used the following definition to identify these theories:

> *"In the context of behaviour change, theories seek to explain why, when and how a behaviour does or does not occur, and the important sources of influence to be targeted in order to alter the behaviour. They should reflect an integration of the knowledge accumulated about the relevant mechanisms of action and moderators of change".*[164]

All of the identified theories were available for researchers worldwide to use in their own research studies across various disciplines wherever behaviour change might have been of relevance to the projects. However, many of the theories had common elements, which made it difficult for researchers to select and then adequately justify their choice of theory for use in their research.[161,164] Additionally, many of the existing behaviour change theories were focussed on particular subsets of behaviour and their corresponding influencers and did not consider wider issues, which could also have an effect on behaviours.[164] For example, one such identified theory was the Consumption as Social Practices Theory, which concerns explorations of consumer behaviour in society and, therefore, would not be directly relevant to a behaviour change intervention that aims to improve public and individual health.[164] Nonetheless, the exploration of time, rules and resources, and lifestyle would all be relevant to health-related behaviour change interventions and indeed are encompassed under the umbrella terms of the chosen COM-B model.[164]

Choosing a theory with the right focus to explore the influencers of behaviour seemed problematic as it may have resulted in the researcher not considering potential revelations. Therefore, Michie et al. (2014) conducted a synthesis of the existing behaviour change theories in response to this identified myriad of overlapping or focus-specific existing theories.[164] They originally identified the key domains across the identified theories as 128 constructs from 33 theories. They then refined this synthesis resulting in 84 components, which were further refined as part of a 3-step validation process. The final product, known as the 'Theoretical Domains Framework' (TDF), consisted of 14 domains, which were the result of a synthesis of 33 identified behaviour change theories.[161,164] It's fourteen domains to describe the determinants of behaviour as identified by the existing literature include: 1. Knowledge, 2. Skills, 3. Social/professional role and identity, 4. Beliefs about capabilities, 5. Optimism, 6. Beliefs about consequences, 7. Reinforcement, 8. Intentions, 9. Goals, 10. Memory, attention, and decision processes, 11. Environment context and resources, 12. Social influences, 13. Emotion, 14. Behavioural regulation.[164]

The TDF has been used in qualitative studies and quantitative survey studies and has been applied to healthcare research and intervention development previously.[166–168] Of particular note, the TDF has previously been successfully applied to gain an understanding of a range of health behaviours including, the provision of smoking cessation advice.[162,164,169–172]

The TDF was a pre-cursor to the COM-B model, which was also developed from the 33 theories that had been identified by Michie et al.[162,164] The development process for the COM-B model was, therefore, deliberately designed to draw from the fields of psychology, anthropology, sociology, and economics; enabling the exploration and development of

interventions which could be applied in healthcare settings.[164] Like the TDF, the COM-B Model has a clear advantage over the pre-existing behaviour change theories as it is a synthesis product of many of the available theories.[164] Furthermore, the COM-B Model can be understood and applied to research by HCPs and researchers from different disciplines, whereas some theories would not be appropriate to be used by those without a background in psychology.[173]

The COM-B model can be described as a "variant" of the TDF as it further synthesises the domains into three broad categories: Capability, Opportunity and Motivation.[162] These categories offer a less prescriptive and broader ranging guidance for informing the data collection tools used in this research project, in comparison to the 14 TDF domains. As such, the COM-B was preferred for use in the empirical research presented in this thesis.

2.2.3.3 How can it be used?

The COM-B model can be used to gain an understanding of the target behaviour. As such, this model may be used as the first step in the development of a complex intervention, in compliance with the MRC guidance.[162,174]

The model provides a structure to breakdown the determinants of behaviour, thereby allowing researchers to explore behaviour characteristics and understand behaviour in terms of each of the components: capability, opportunity, and motivation (ref). A COM-B analysis enables the identification of capability, opportunity, and/or motivation to be identified as a barrier(s) to the desired behaviour. Thus, it is possible to target these (as identified as barriers) in a future behaviour change intervention.[162]

Overall, the COM-B Model can be used by researchers to promote public health by supporting the development of health promotion interventions, which are theory-informed and are, therefore, more likely to lead to a change in behaviour. Behaviour change interventions which were guided by the use of the COM-B Model have been successful in improving the provision of healthcare and public health at the individual, community and population levels.[162,165,175–181] Use of this structured approach to intervention development has improved the transparency of the development process and enabled better implementation and evaluation of the intervention.[182]

2.2.3.4 How I have used the COM-B model in my empirical research

After understanding the use of theory in the context of behaviour change, this thesis accumulates the existing knowledge in the literature around the knowledge-base, behaviours, beliefs, and the influencing factors of behaviours of HCPs in promoting SHS harm reduction to service users in primary care settings. Subsequently, the COM-B model is applied to the development, conduct, and analysis of the empirical research studies, thereby using theory appropriately to ensure a thorough exploration of the research question.

Michie et al. (2014) explain that changing behaviour is complicated by the difficulty in identifying a single component as a barrier or to be changed in order for the target behaviour to be achieved successfully. Instead, behaviour change (including the identification of barriers and target behaviours) will involve "interrelated components".[162] Moreover, the target population is often so varied within the category of exploration, which further complicates behaviour change(86). For example, within the HCP sample group for both the quantitative and qualitative studies, it was anticipated that there would have been

a variety of types of HCPs who had different roles in the provision of healthcare and who had different levels of training and therefore knowledge of SHSe. Target population variation, such as this, demonstrates the complexity of identifying a singular component that acts as a barrier to a target behaviour. The COM-B model allows for the exploration within the COM categories in account of the anticipated complex nature of the target behaviours and barriers to achieving them.

Michie et al. (2014) also pointed out that health-related behaviour change can be implemented at a range of levels from those influencing the behaviours of individuals up to those involving legislative actions to affect change at a societal level.[162] Therefore, it is reasonable to assume that the barriers to displaying target behaviours (HCPs' delivery of SHS harm reduction intervention to service users in primary care settings) also exist at levels ranging from individual to societal. In this thesis, I have explored the influences on the behaviours and perceived behaviours of individual HCPs and service users.

In the case of this study, we explore the possibilities for an intervention which would be to change the behaviour of individuals (both the HCPs in terms of their clinical practices and from the service users in terms of receiving the intervention and the influence of this on their home smoking behaviours). A further complexity involved with health-related behaviour changes is the fact that the outcome of the behaviour change may be seen at a different level to that where the intervention was implemented.[162] Any resultant intervention (developed as a follow-on project to this thesis) would aim to encourage HCPs to modify existing or to incorporate new behaviours as necessary to affect the delivery of SHS harm reduction messages to service users as appropriate. As it would be HCPs who

would implement a future intervention, it was crucial that their views and needs be adequately explored and incorporated into any future work. Service users were also sampled for the qualitative study, which offered an in-depth exploration of the perspective of those who would be receiving the interventions for SHSe. These viewpoints complemented the views of the interviewed HCPs, as described in Chapter 5 (DeSSIP study). The results of the service users' data contributed to the data analysis and interpretation.

Using the COM-B model from the development of this study through to the analysis of the results has enabled me to ensure the research studies are theoretically grounded from the outset through to the interpretation of the results. Therefore, I have used the theory in the way described by Michie et al. (2014): reporting how it was used to design the study, how it was used to identify barriers to target behaviour display (delivery of SHS harm reduction intervention in primary care settings), to describe the relationship between the results and the chosen model of behaviour which has theoretically grounded the empirical research.[162] This echoed the advocated practice around the use of theory to guide study development, conduct and analysis.[155]

In summary, two independent, concurrent research studies used the COM-B model in this Ph.D. project. In the qualitative study, the COM-B model was used to inform the development of interview topic guides and to provide a structure for the interpretation (offering an overarching deductive codebook) and presentation of the study results. The use of the COM-B model across all of the interviews allowed for comparisons to be made across the groups and subgroups of participants. In the quantitative survey study, the COM-B Model was used to structure the survey questions and to select the key areas that should be

explored by asking for respondents' opinions on those questions. Again, the COM-B model was also used to structure the presentation of the data analysis. Furthermore, the overall results of the completed Ph.D. thesis are directly transferable for application into the wider frameworks, such as the Behaviour Change Wheel, in any future feasibility study to develop and design interventions according to this COM-B presentation of the Ph.D. results.[161,162]

2.3 Reflection of myself as a researcher

2.3.1 Importance of reflexive practice

Although research aims and methods are systematic, predefined, and attempt to be objective, it is inevitable that the background of a researcher will influence their research activities.[183] Both the personal and professional backgrounds of a researcher can shape the research questions that are asked, as well as influencing data collection, analysis, and interpretation.[156] It is, therefore, important for researchers to be aware of their own backgrounds and to take these into consideration whilst conducting research. Such reflexive practice is important factors when designing research questions particularly for topics that may be sensitive,[184] such as the issue of parents/carers exposing non-smokers at home (e.g., their children) to SHS. Reflexive practice is important as "knowledge and understanding are contextually and historically grounded, as well as linguistically constituted".[185] The process of recording and reflecting on my own interpretations as the researcher illuminated my own potential influence on the data and the resulting conclusions and outputs; the validity of both was strengthened by this transparency (as discussed in Chapter 7).

2.3.2 Researcher's background

I have never smoked and I come from a family of non-smokers. However, I have experienced regular SHSe during childhood in the homes and cars of friends and neighbours. I can, therefore, appreciate how the smoking behaviours of a single resident can affect the health of all those who regularly spend time in the same home environments. Following discharge from the hospital for a respiratory complaint in childhood, my parents and I were advised by HCPs to stay away from areas where people were smoking cigarettes. This proved to be difficult advice to follow as it was impractical in reality, and it was not feasible for a child or a guest to implement any action to reduce their exposure levels when in the home or car of a person who was a smoker. The need to provide practical advice to support smokers to reduce the harms caused by SHSe was, therefore, a matter that I have reflected on in adulthood.

My professional background as a pharmacist with experience working in both community and hospital environments has shown me the importance of offering lifestyle advice in promoting and maintaining health. Over the course of my education, I have been repeatedly told of the detrimental health effects caused by directly smoking tobacco products. During my pharmacy training, the effects of SHSe were also discussed as part of the training around smoking cessation counselling. I have completed smoking cessation training both as an undergraduate pharmacy student (in theory, which was taught during lectures and small group taught sessions and workshops, as well as in practical sessions with assessments in the form of workshops and Objective Structured Clinical Examinations). This learning was reinforced during my pre-registration pharmacy training year by the same methods. During placements in community pharmacies across Birmingham, I had the chance to shadow and

offer smoking cessation counselling to patients who were attempting to quit smoking. However, these training experiences focussed predominantly on smoking cessation. I became more aware of the health consequences of SHSe through the 'Smokefree' campaign, which was led by Public Health England.[186] To build on this, I have since completed the training on providing Very Brief Advice to smokers to help them to reduce smoking in the home.[187] This training was made available by the UK Department of Health and is accessible to pharmacists via the Centre of Postgraduate Pharmacy Education or via the National Centre for Smoking Cessation and Training (which allows free access to the training to all HCPs). In addition to gaining awareness on the topic of SHSe through my role as an HCP, I always had some insight into some of the barriers and challenges that HCPs may encounter with regards to intervening to support SHSe reductions. It was, therefore, essential that during data collection, I did not project my experiences or thoughts on those of the interviewees.

Additionally, in my role as a pharmacist, I regularly consult with service users who have addictive behaviours. I also regularly engage with the family members of this service user group and can appreciate how SHSe, as a result of nicotine addiction, can be one of many problems that affect the lives of those who live with someone who smokes in the home. I recognise that for many people quitting their addictive behaviour can be a daunting and unappealing prospect. Therefore, I believe that research looking to help empower service users with addictions to be able to adapt their behaviours would be of benefit to those who live them, especially when removing the addictive substance is not considered to be a viable option at that point in time.

2.3.3 Possible effects of my biography and work on this study

The possible effects of my biography and work on this study are discussed further in Chapter 7, together with a discussion of strengths and limitations.

2.4 Summary

Mixed-methods research is a continually growing approach to research.[123] It is particularly suited to applied health research questions such as those being answered in this thesis. Mixed-methods approaches are applied to this thesis in four stages, as described in this chapter. Chapters 3 to 6 present each of the stages of this mixed-methods research. After reasoning above (Section 2.2.2) the importance of using theory, the research presented in Chapters 4 to 6 are underpinned by the COM-B model of behaviour change, in addition to being built upon the systematic review (Chapter 2) findings. The COM-B model is well-suited for application in answer to this thesis' objectives. A pragmatism paradigm has been adopted for the conduct of this Ph.D. research, aligning to the mixed-methods approach.

CHAPTER 3:

PRIMARY CARE HEALTHCARE PROFESSIONALS' KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS PROMOTING THE REDUCTION OF CHILDREN'S SECONDHAND SMOKE EXPOSURE: A MIXED-METHODS REVIEW AND SYNTHESIS

As described in Chapter 1 (background) the detrimental health effects of secondhand smoke exposure (SHSe) for children are well established, and there is evidence to suggest that healthcare professionals (HCPs) may be well placed to intervene with smoking parents. However, the evidence base around HCPs' practice, knowledge and attitudes to delivering SHSe harm reduction messages had not been robustly synthesised. Therefore, this chapter of the PhD thesis presents a mixed-methods systematic review and synthesis of the global literature on how SHSe is being addressed in primary care settings. The findings of this chapter contribute to answering thesis objectives A, B and C (see Section 1.5.3).

3.1 Systematic review and synthesis

The systematic review and synthesis has been presented in this chapter in the format of the manuscript as was published (in December 2017) and later made available online as an Editor's Choice article (in April 2019) in the Nicotine and Tobacco Research journal.[122] The editor has provided written permission for the paper to be included, as published, in the thesis.

Publication number: 1

Publication title: Primary care healthcare professionals' knowledge, attitudes, and practices towards promoting the reduction of children's secondhand smoke exposure: a mixed-methods review and synthesis

Page number of thesis: 88

3.2 Update of the literature since the publication

Given that this systematic review (available online from December 2017) was published earlier on in my PhD research and that the initial searches only included literature published until February 2016, I have undertaken a further rapid search on Medline and also using forward citation searching to find any new literature which may be relevant to my review question. Although I have not undertaken a further systematic search, a rapid review of the evidence would indicate that only a further three studies have been published that would meet the inclusion criteria for my systematic review and synthesis.

This first additional paper[188] reported the findings of a cross-sectional, descriptive survey of French GPs with regards to the management and prevention of recurrent respiratory tract infections for children. Of the 358 survey participants, 205 reported secondhand smoke exposure as an important risk factor for the occurrence of recurrent respiratory tract infections in children. Indeed, this was reported to be the second most important of the identified risk factors; thereby echoing HCPs' awareness of the detrimental health effects of SHSe as identified in the systematic review. Smoking cessation was the only practice which the surveyed GPs reported to be an action to address SHSe for the purpose of preventing the recurrence of respiratory tract infections in children. This lack of identification of other harm reduction techniques to prevent SHSe effect coincides with the lack of knowledge which was identified in the systematic review. For example, HCPs were unsure of how to intervene in practice to support patients and smokers to reduce SHSe levels having an awareness of the need to do this. Finally, the survey highlighted that GPs' perceptions of their patients' attitudes in response to receiving smoking cessation advice posed as a barrier to intervening and promoting cessation for the purpose of SHS harm reduction. Therefore, the results of

this later publication concur with the findings presented in this chapter's systematic review and synthesis.

The further additional two papers[70,189] both presented baseline "practice" data taken from electronic health records prior to the implementation of an intervention. Their data echoed the findings of those reported in the systematic review, whereby HCPs were seen to Ask more than they do Advise or Act around SHSe in practice. Furthermore, referral to smoking cessation programmes was again the only method of SHSe reduction referred to as seen in my review findings.

3.3 Summary

This systematic review highlighted a lack of research in this area with only 20 studies included in the analysis and a further three relevant papers having been published since 2016. The review findings highlighted that HCPs provide little practical action despite showing an understanding of the consequences of SHSe. The findings identified a number of barriers that prevented intervention, even when HCPs were aware of the need to intervene. Some of the key barriers included: time pressures which affected prioritisation of the issue; a perception of negative reactions from parents of exposed children which affected HCPs' relationships with patients and their carers; lack of training delivered to HCPs on how an intervention might be delivered in practice. Thesis objectives A, B, and C have been addressed in the completion of this systematic review. The findings of the review have then been explored further in the UK setting in the subsequent primary research studies (Chapters 4 and 5) to achieve the thesis aim.

CHAPTER 4:

DELIVERING **S**ECONDHAND **S**MOKE **HA**RM **R**EDUCTION **M**ESSAGES IN PRIMARY CARE: A CROSS-SECTIONAL SURVEY OF HEALTHCARE PROFESSIONALS (**DESSHARM** STUDY)

This chapter presents the methods and results of an online cross-sectional survey, which aimed to understand UK healthcare professionals (HCPs) current secondhand smoke exposure (SHSe) related practices as well as their capability, opportunity, and motivation to intervene around SHSe in primary care. This primary quantitative research study builds on the evidence gaps highlighted in Chapter 1 and the findings of the systematic review[122] (Chapter 3), and also complements the data presented in the qualitative component of this thesis (Chapter 5). The findings of this study contribute to answering thesis objectives A-C (see Section 1.5.3).

4.1 Study overview

4.1.1 Study aim

This research study aimed to (i) assess the current practices of UK primary care-based HCPs in relation to SHSe, and (ii) to investigate the influencing factors shown to determine these HCPs' intervention delivery behaviours concerning SHSe (i.e., HCPs' level of capability, opportunity and motivation to intervene).

4.1.2 Study objectives

To achieve the study aim, the study objectives were pre-defined as:

1. To assess the frequency of occurrence of SHS-related interventions based on participants' self-reported current practices.

2. To investigate participants' level of agreement in response to statements concerning their capability, opportunities, and motivation to provide SHSe harm reduction interventions in primary care settings.
3. To further explore the findings of a systematic review of the global literature base with UK survey participants[122].

4.1.3 Theoretical framework

The COM-B Model[162] of behaviour change, as described in detail in Chapter 2 (Methodology), was chosen to guide the design and analysis of this study. In addition to capturing a snapshot of reported practices in relation to SHSe, the survey tool captured HCPs' self-reported capability, opportunity, and motivation to intervene in practice. The results of the systematic review[122] (Chapter 3) were used to shape the final survey questions and to guide the selection of questions for inclusion in the final survey data collection tool from those which had been developed in alignment with the COM-B Model,[160] as detailed below (Section 4.2.4).

4.2. Methods

4.2.1 Study design

A quantitative study using an online cross-sectional survey, with questions informed by the COM-B Model[160] and the findings of an earlier systematic review.[122]

4.2.2 Sample & recruitment

4.2.2.1 Inclusion criteria

The study included respondents who were HCPs working in primary (including community) care settings in the UK.

4.2.2.2 Exclusion criteria

Participants were excluded from this study if they worked in primary care settings but were aged under 18 years old or if they were a student HCP. The rationale for excluding students who worked in primary care settings was that they were likely to have a different remit of actions and responsibilities to their fully-qualified colleagues. Many of the survey questions were specifically applicable to qualified members of the primary healthcare team.

4.2.2.3 Sample size

Healthcare professionals may have had limited capacity to undertake the survey.[190,191] As seen in other studies, convenience sampling was used supported by online survey distribution.[192,193] Therefore, the survey was developed via an online platform and with a completion time of around 10 minutes. With the aim of maximising recruitment within the proposed timeframe of the Ph.D., no formal sample size calculation was conducted.

4.2.2.4 Recruitment methods

Due to a lack of direct pathways to access potential participants, a wide range of recruitment pathways was employed to maximise the sample. Respondents were self-selected volunteers who had chosen to participate after seeing the study advertisement material (Appendices 4.2, 4.3, 4.5). A hyperlink giving access to the survey was widely distributed. The methods of distributing the advertisements to potential participants across the UK included circulation via: professional/membership bodies (e.g., Royal College of General Practitioners); Vocational Training Schemes and affiliated professional support networks; Clinical Commissioning Groups; and University-based opportunities (e.g., appropriate University email mailing lists, as permitted); as well as via the research team's personal

networks. Advertisements were also delivered in-person (e.g., at conferences, or electronically via the social media platforms of the specified groups for recruitment). The study advert was also used as a poster to be physically displayed/distributed as well as an image for an electronic advertisement. These posters were physically displayed in work settings, such as GP practices, in addition to being displayed at conference events. A Twitter account was set up specifically for this study to generate interest in the study and to facilitate recruitment by electronic advertisement.

This range of advertisement distribution methods were employed to maximise study recruitment. The distribution methods involving professional bodies or vocation-specific events were targeted at the recruitment of GPs, nurses and pharmacists. Recruitment methods encompassing the researcher's own network, snowballing and advertisements distributed through social media were used to aid the recruitment of other HCP groups working in primary care settings.

4.2.2.5 Screening

Potential participants who were interested in the study and accessed the online survey were screened for eligibility to participate prior to the consent screen and the start of the questions (Appendix 4.06). No data were collected from those who did not meet the pre-defined eligibility criteria. The survey was designed to automatically redirect respondents who were not eligible and did not give consent for participation to a page that explained this and thanked the respondent for their interest with a pre-set statement. Thus, effectively ensuring the a priori consent and ethical requirements (Section 4.2.3) were upheld throughout the data collection stage.[194]

4.2.3 Ethical and regulatory compliance

4.2.3.1 Consent

Electronic consent was sought from all participants prior to the start of the survey. The potential participants were first provided with a brief overview of the study, a link to the participant information sheet, and the contact details (email addresses) of two members of the research team. The study overview included an explanation to inform participants that by answering a question, the research team would assume consent was given to use this response in the survey data analysis. An explicit request for consent was then asked following the successful completion of the eligibility screening questions. The electronic survey was designed to ensure that participants were unable to proceed to answer the survey questions if consent had not been provided.

4.2.3.2 Confidentiality

No identifiable information was collected from participants. Therefore, all participants remained anonymous, and this was clearly explained in the study overview, which preceded the survey questions and also in the participant information sheet.

All data were treated as confidential information. SmartSurvey was chosen to host the electronic surveys to ensure all data were held in the strictest confidence. Furthermore, SmartSurvey uses UK/EU-based servers and is ISO27001 accredited.[195]

4.2.3.3 Participant withdrawal

Participation in this study was entirely voluntary and was reliant on respondents' own interest in this research in addition to the encouragement that is given to HCPs to partake in research activities. Respondents were informed at the beginning of the survey that any

answers that they gave would be used for the purposes of this research. As no identifiable data were requested from respondents, it was not possible to remove data at the respondents' request, once it had been collected by SmartSurvey.

4.2.3.4 Storage, access and disposal of data

All members of the research team had up to date Good Clinical Practice (GCP) training and were compliant with the core principles outlined by the Data Protection Act 1998, including those relating to the collection, storage, access, and disposal of data. In addition to this, the University of Birmingham's data protection policies and procedures were upheld by all members of the research team.

Computer-held data were securely stored on encrypted and password-protected machines/ devices which were approved for use in research by the University of Birmingham.

In accordance with the University of Birmingham's policies for the storage of anonymous data, the study data are being stored for ten years after the publication of the study findings. Only the study team, the sponsor, and relevant authorities had and continue to have access to the datasets as appropriate.

4.2.3.5 Study approval

This study was reviewed and granted approval by the University of Birmingham Central Ethics Committee (Appendix 4.1).

4.2.4 Data collection

4.2.4.1 Data collection tool

An online cross-sectional survey was deemed the most appropriate method for data collection. This method of data collection offered a snapshot of the current practices and self-reported capability, opportunity, and motivation to intervene around SHSe in primary care. The benefits of using an online platform meant that the survey could be easily distributed to HCPs across the UK; completed at the HCP's own convenience (time and location) and the results would be collected and collated automatically.[194]

4.2.4.2 Survey question development

No validated surveys that were relevant to answering the study objectives were identified within the literature. However, previous studies involving COM-B- or TDF-focussed questionnaires as a tool for data collection were available and were used to provide guidance on the use of behaviour change theories in the development of survey questions.[165,168,171,176,196] The questions that had been used in these previous studies[165,168,171,176,196] were collated and adapted to suit the research objectives of this study. Additionally, the reference textbook describing the COM-B Model[162] and its use in research studies was used to compile a list of questions that could be incorporated into the research survey. The 14 domains of the TDF[197] were also used to guide the question development and ensure that all aspects of the COM-B Model were being covered as appropriate.

The systematic review[122] findings were also used in the question development stage to guide the focus of the questions within the practice, capability, opportunity, and motivation domains. This helped to ensure that the survey results would be comparable in the

outcomes to those found in the review[122] findings and also would complement the outcomes from a parallel qualitative research study.

An overall list of potential survey questions were collated in this way. Reviewing this list enabled the final survey questions to be developed through a process of amalgamation of any similar questions; elimination of those questions which were deemed unnecessary; and adaptation of those questions which were important to include but needed to be tailored to specifically address this research study's objectives.

A mixture of positively and negatively worded statements was used in the survey to prevent the occurrence of and also to highlight instances of forced choice or social desirability biases.[198] The number of questions was limited to five per domain to keep the time needed for completion of the survey as short as possible whilst still gathering sufficiently rich data to answer the aims of this research.

An outline of the survey questions for each of the four domains of interest (practice, capability, opportunity, and motivation) is provided in Table 4.1. Five statements were firstly posed to respondents to ascertain a snapshot of their self-reported clinical practices. The questions around capability were designed to investigate respondents' knowledge base and reported skill set with regards to addressing the issue of SHSe in their usual clinical practice. The opportunity-focussed questions examined the situations in which SHS might be addressed in addition to questioning the potential facilitators and barriers to these situations. The questions around HCPs' motivation to address the issue of SHS, investigated HCPs' own beliefs about SHSe intervention as well as their perceptions of the consequences of intervening.

Table 4.1: Survey questions and statements as aligned to practice, capability, opportunity, and motivation

Domain	Five-point Likert scale for response	Survey questions
Current practices	Please indicate the level of occurrence of the following tasks in your usual clinical practice: • Never • Rarely • Sometimes • Often • Always	Asking non-smokers about their exposure to SHS
		Asking smokers about others who may be exposed to SHS at home
		Providing information on the health effects of SHSe
		Delivering SHS harm reduction messages to smokers
		Acting (e.g., referrals or medication prescription) to support smokers to reduce the exposure levels of those around them to the SHS
Capability	Please indicate your level of agreement with the following statements: • Strongly disagree • Disagree • Neutral • Agree • Strongly agree	I understand what the health effects of SHS are
		I have had sufficient training on the topic of SHSe.
		I do not know how to ask smokers about the SHSe of others in their home(s)
		I know enough to be able to answer any questions that patients (and their carers) might have around SHSe.
		I do not know how to support smokers to reduce the levels of SHSe of those they live with, when they are not ready or not able to quit smoking.
Motivation	Please indicate your level of agreement with the following statements: • Strongly disagree • Disagree • Neutral	It is important to intervene with smokers to help reduce others' exposure to SHS.
		Smokers want HCPs to support them in reducing the health effects of SHSe of those they live with
		I would feel uncomfortable intervening with smokers to help reduce others' exposure to SHS.

	• Agree • Strongly agree	Raising the issue of SHSe with smokers would create a problem in my professional relationship with them.
		Smokers will not engage in interventions to reduce others' exposure to the SHS.
Opportunity	Please indicate your level of agreement with the following statements: • Strongly disagree • Disagree • Neutral • Agree • Strongly agree	It is easier to intervene around SHSe during follow-up appointments with patients rather than in the first consultation.
		I have insufficient time to intervene around SHSe.
		I will only intervene around SHS when it causes an apparent or a worsening medical problem.
		SHS is often a lower priority as smokers have other problems (e.g., social problems) which need to be addressed
		I feel well supported to be able to intervene with smokers and help them to reduce others' exposure to SHS

HCPs: healthcare professionals; SHS: secondhand smoke; SHSe: secondhand smoke exposure

4.2.4.3 Survey piloting

The online survey was tested by five individuals from a mixture of professional backgrounds (including three public sector employees (n=2 from NHS and n=1 from Police) and two postgraduate researchers at the University of Birmingham). The process of piloting during the development of the survey instrument was used to ensure that the questions were easily understood; the available responses were sufficient, and; the online survey interface worked well and was easy to use and complete.[194] As the survey instrument was designed specifically for this study and had not been previously validated, the piloting process was particularly important. The pilot respondents also reported the length of time taken to complete the survey (the average time was 13 minutes -reported to the nearest minute).[194] This measurement was taken to inform the recommended time for completion stated in advertisements during recruitment. However, some pilot respondents explained that they had completed the survey whilst also completing other tasks, which meant it took them longer to finish the survey questions. Thus, in advertisements, the survey was said to take approximately 5-10 minutes to complete.

Testing and revision continued until no new errors, queries, or suggestions were identified. One key change that was requested concerned the chosen terminology. The term “primary care” was updated to "primary/community healthcare" in all study material, which would be seen by HCPs. Feedback indicated that although managers typically use the term “primary care”, patient-facing staff (to whom the survey would be targeted) may not associate themselves with this terminology and would instead describe their work setting as “community care”. This amended terminology was used solely to aid respondents’ understanding of the study information and survey questions. However, the term “primary

care" is otherwise considered sufficient to describe the healthcare sector of interest for this project. No other significant changes were suggested by the pilot respondents outside of the sentence structuring to make some statements easier to read and understand.

4.2.5 Data analysis

4.2.5.1 Data management and cleaning

All of the electronic survey data were downloaded from the host server onto the University of Birmingham (encrypted and password-protected) computers used by members of the research team. Microsoft Word (for free text responses) and Microsoft Excel (for numeric responses) packages were used to manage the downloaded data.

The software package, SPSS (versions 23 and 24), was used to conduct statistical analysis of the results. The data were analysed using descriptive statistics and also using regression analysis to explore if respondents' characteristics were associated with particular practices or capability, opportunity or motivation to intervene around SHSe.

The data were cleaned in Microsoft Excel to remove responses from participants who had completed the screening questions but then later indicated they were ineligible to have completed the survey. For example, one respondent disclosed that they were a hospital doctor in their answer to the demographic question concerning their occupation. Additionally, responses were reviewed for questions where 'Other' was selected as the answer, and further information was given. Duplicate responses were looked for, but none were identified. The data from respondents who had only completed the screening questions but did not answer any research questions were excluded from any further analysis at this stage. In cases where a respondent had answered one or more of the

research questions in addition to the screening questions, the data were carried forward for descriptive analysis. However, respondents with incomplete survey responses were later excluded from some of the regression analysis stages, as appropriate (the number of respondents included for each stage of analysis has been specified in the results presented later in this chapter).

4.2.5.2 Analysis method

The survey responses were grouped and analysed by the domain (i.e., current practice and capability, opportunity, and motivation to intervene). Furthermore, the questions pertaining to the current practice domain were divided into the individual ask, advise, and act categories; the results for each of these categories were analysed independently in addition to analysis of the results for the overall practice domain. The results were first descriptively analysed. Frequencies and percentages were calculated for each of the background questions relating to participants' characteristics, to provide a summary of the sample demographic profile. Frequencies, means, and standard deviations were calculated for each question. Composite scores were then calculated for each of the domains by assigning the values of 1 to 5 to the Likert responses (as detailed in the Results section) and calculating a total score. In cases where statements were negatively worded, the data were reverse coded for analysis. Each domain had a maximum possible score of 25, except for 'opportunity', which had a maximum score of 20 to account for the exclusion of one statement from the composite score calculation. This excluded opportunity statement related to the easiest type of appointment for intervening around SHSe and so would not have been associated with a high or low level of opportunity to intervene. The mean composite score and the standard deviation was calculated for each domain. For all domains, respondents who had scored 4 or

5 for all of the statements in that domain were reported as having a 'high' level (of capability, opportunity, or motivation) to intervene. For example, if a respondent scored 4 or 5 across all of the motivation questions, they would be considered to have a 'high' level of motivation to intervene around SHSe. For the purpose of this thesis, 'good practice' was defined in the same manner with those scoring 4 or 5 for all of the practice-related statements classified as demonstrating ‘good practice’ towards SHSe. There was no definition of ‘poor practice’, only simply the lack of ‘good practice’ when respondents did not score 4 or 5 in their answers.

Associations between the mean score in each domain and respondent characteristics were investigated using unadjusted and adjusted linear regression analyses. Descriptive statistics were used to check for (close-to) normal distribution in the data sets prior to conducting the linear regression analyses. Collinearity was tested for by generating Variance Inflation Factor values via SPSS. No significant collinearity was identified, and the analyses were adjusted for all of the following respondent characteristics: gender, age, ethnicity, highest qualification, type of HCP, current work setting, length of employment in primary/community care sector, and smoking status.

The HCP groups which were defined in the analyses were: General Practitioner, Nurse or Health Visitor, Pharmacist, or Other. Conducting sub-analyses with these HCP groups allowed for exploration of any potential differences in their current practices or their capability/ opportunity/ motivation to intervene around SHSe. Any potential differences would help to inform the development of any future intervention involving HCPs in the promotion of SHS harm reduction based on the sub-analyses findings. Additionally, these

sub-analyses findings would help to identify any particular target groups for an intervention. These named four HCP groups were chosen for the sub-analyses as these represented the main vocational groups of the survey respondents, see Table 4.2.

Binary logistic regression was used to help identify which, if any, of the respondent characteristic variables were associated with the achievement of high levels for each of the domains. However, the small number of respondents who were identified as having a high level for each of the domains meant that this analysis lacked power. Hence, the confidence intervals were often very wide, and it was not appropriate to conduct adjusted analyses.

4.3 Results

4.3.1 Respondent characteristics

4.3.1.1 Number of responses

Overall, a total of 230 survey responses were received from the UK population of primary and community care-based HCPs and health-related workers between August 2017 and May 2018. Fifty-eight responses were not eligible for inclusion in the study data analysis (due to not meeting the consent and eligibility criteria for participation or where respondents had opened the survey but not answered any of the research questions beyond the consent and screening stage). Therefore, 172 responses were included in the final sample. Of these 172 survey responses, 138 provided complete data, 12 had some missing demographic data, and 22 had some other data item(s) missing. As the survey was distributed electronically across a range of platforms, it was not possible to calculate a response rate.

This final sample of 172 responses which were incorporated into the data analysis stage is a small number in comparison to the total population of eligible HCPs working in UK primary

care settings. This limits the transferability of the study findings. Furthermore, the low number of respondents and also the low respondent numbers in each of the sub-groups for analyses may result in some of the statistical tests being underpowered as is discussed in section 7.4.2 of this thesis.

4.3.1.2 Summary of respondent characteristics

Table 4.2 presents a summary of the survey respondent characteristics. The majority of respondents were female (n=104, 60.5%), aged 25-54 years (n=130, 75.6%), of white ethnicity (n=105, 61.1%), and had some type of degree of professional qualification (n=105, 61.1%). General practitioners were the main group of HCPs to respond to the survey (n=55, 32.0%) followed by nurses and pharmacists (both n=25, 14.5%). There were a similar number of respondents who reported that they were working in primary care (n=80, 46.5%) and community care settings (n=73, 42.4%). Most respondents were working in England (n=153, 89.0%). The majority of respondents were never smokers (n=127, 73.8%). The largest group of ex-smokers reported having last smoked a cigarette over a decade ago (n=11, 37.9%). Only 1.2% of respondents (n=2) stated they were a current smoker and reported smoking 1-10 cigarettes per day on average.

Table 4.2: Summary of respondent characteristics

Respondent characteristics	**n (%)** **Total n = 72 (%)**
GENDER	

Male	54 (31.4)
Female	104 (60.5)
Missing	14 (8.1)
AGE	
24 or less	4 (2.3)
25-34	40 (23.3)
35-44	42 (24.4)
45-54	48 (27.9)
55-64	23 (13.4)
65 or over	2 (1.2)
Missing	13 (7.6)
ETHNICITY	
White	105 (61.1)
Asian or Asian British	36 (20.9)
Black or Black British	10 (5.8)
I do not wish to disclose my ethnic origin	5 (2.9)
Missing	16 (9.3)
HIGHEST QUALIFICATION	
O Levels/ CSEs/ GCSEs/ Foundation Diploma	1 (0.6)
AS or A Levels/ Advanced GNVQ	6 (3.5)
Degree (e.g. BA/ BSc)	60 (34.9)
Higher Degree (e.g. MSc/ PhD)	45 (26.2)
Professional Qualification (e.g. nurse/ teacher)	46 (26.7)
Missing	14 (8.1)
TYPE OF HEALTHCARE PROFESSIONAL	
General Practitioner	55 (32.0)
Nurse	25 (14.5)
Health Visitor	8 (4.7)
Healthcare Assistant	7 (4.1)

Dentist	1 (0.6)
Pharmacist	25 (14.5)
Other:	36 (20.9)
Speech and language therapist	8 (22.2)
Community paediatrician	7 (19.4)
Occupational therapist	5 (13.9)
Dietician	4 (11.1)
Physiotherapist	3 (8.3)
Physician associate	2 (5.6)
Pharmacy technician	2 (5.6)
Clinical psychologist	1 (2.8)
Podiatrist	1 (2.8)
Dental assistant	1 (2.8)
Assistant practitioner	1 (2.8)
Not specified	1 (2.8)
Missing	15 (8.7)
CURRENT WORK SETTING	
Primary Care (your work is mainly based in a GP practice)	80 (46.5)
Community Care (you see patients in clinics and home visits)	73 (42.4)
Missing	19 (11.1)
LENGTH OF TIME IN CURRENT POST	
Less than 1 year	20 (11.6)
1-3 years	36 (20.9)
4-10 years	39 (22.7)
More than 10 years	62 (36.1)
Missing	15 (8.7)
LENGTH OF EMPLOYMENT IN PRIMARY/COMMUNITY CARE SECTOR	
Less than 1 year	13 (7.6)
1-3 years	24 (14.0)

4-10 years	35 (20.4)
More than 10 years	86 (50.0)
Missing	14 (8.1)
WORKING IN WHICH PART OF THE UK	
England	153 (89.0)
Ireland	1 (0.6)
Scotland	0 (0.0)
Wales	1 (0.6)
Missing	17 (9.9)
CURRENT SMOKING STATUS	
Current Smoker	2 (1.2)
Ex-Smoker	29 (16.9)
Never Smoked	127 (73.8)
Prefer not to say	1 (0.6)
Missing	13 (7.6)
(Of the current smokers, n=2) HOW MANY CIGARETTES SMOKED PER DAY?	
1-10	2 (100.0)
11-20	0 (0.0)
21+	0 (0.0)
Missing	0 (0.0)
(Of the ex-smokers, n=29) WHEN WAS THE LAST TIME SMOKED?	
In the last year	5 (17.2)
2-5 years ago	4 (13.8)
6-10 years ago	6 (20.7)
More than 10 years ago	11 (37.9)
Missing	3 (10.3)

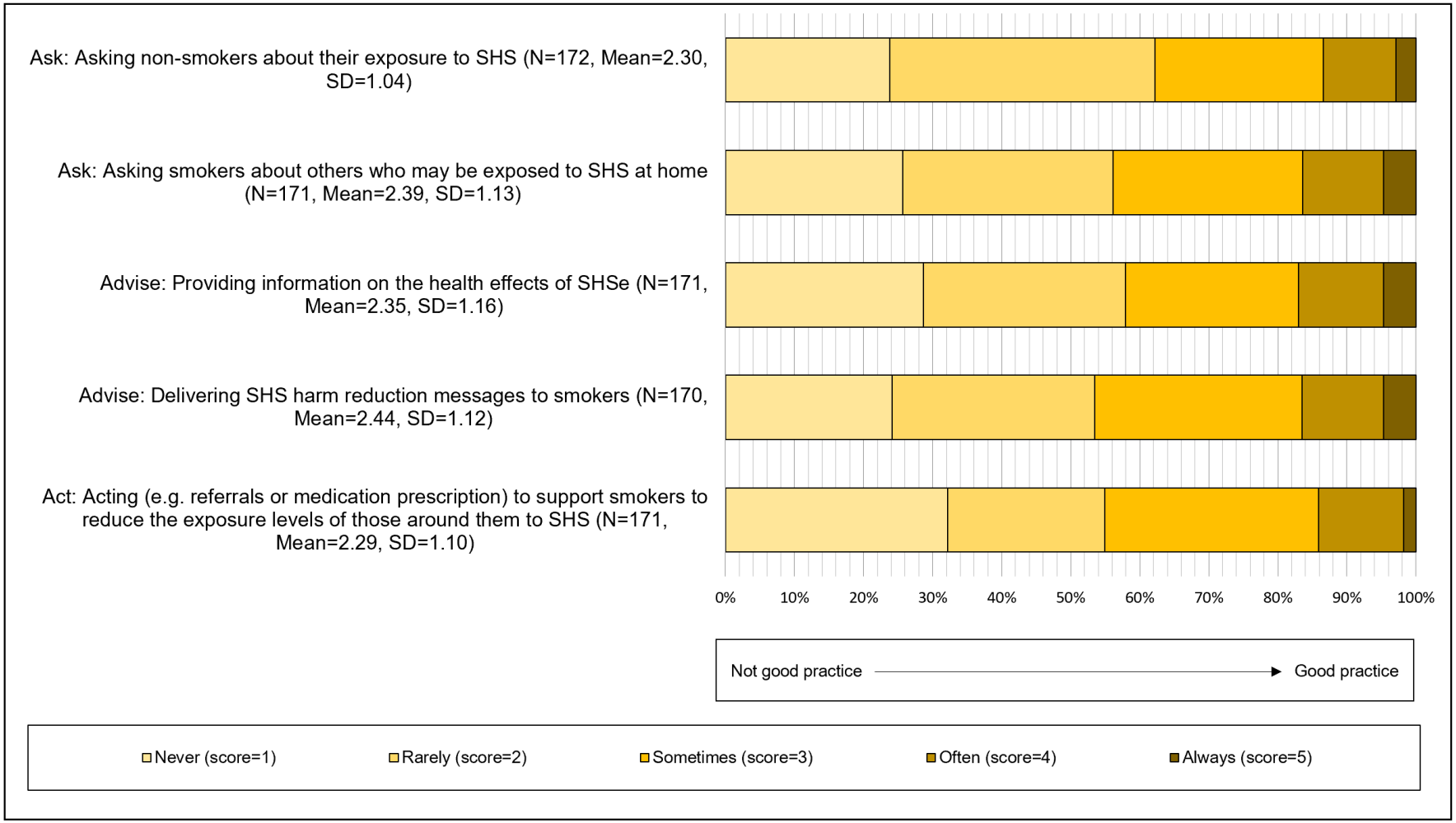
GP: General Practitioner; MSc: Master of Science; Ph.D.: Doctor of Philosophy; UK: United Kingdom

4.3.2 Overall Practice

4.3.2.1 Descriptive statistical analysis

Participants were asked to rate five statements (see Figure 4.1) regarding their usual clinical practice using a 5-point Likert scale, which ranged from never to always practising an intervention. Questions fell into three categories: ask, advise, and act. The results for these categories are also presented individually in this chapter. The median response selected was 'rarely' for all five practice statements, and the mean composite score for all of the practice statements was 11.7 (SD 4.5) of a total possible score of 25. Only 6 (3.6%) of the 172 respondents scored a composite value, which indicated 'good' practice having reported 'often' or 'always' to all five practice statements (asking, advising, and acting to intervene around SHSe).

Figure 4.1: Summary of responses to statements concerning secondhand smoke exposure intervention practices



N: number of respondents; SD: standard deviation

4.3.2.2 Association between respondent characteristics and mean practice score

Three respondent characteristics were found to be associated with mean practice score (see Table 4.3). The mean practice score was significantly lower for respondents without a higher degree compared with those with a higher degree (unadjusted mean difference -1.64 (95% CI -3.15, -0.13)). The combined group of nurses and health visitors reported significantly higher SHS practice scores than GPs (unadjusted mean difference 2.25; 95% CI 0.43, 4.07). Healthcare professionals who reported being a current or ex-smoker had a significantly lower mean practice score than HCPs who reported never smoking (unadjusted mean difference -1.91; 95% CI -3.63, -0.20).

These observations remained statistically significant after the model was adjusted for all respondent characteristics and strengthened the associations in some cases compared to the unadjusted model. The mean composite practice score was seen to be 1.97 lower than the mean score for those respondents with a higher degree compared to those with other levels of their highest qualification (adjusted mean difference -1.97 (95% CI -3.54, -0.39)). The adjusted mean difference in practice composite score remained statistically significant for the group of nurses and health visitors compared to the groups of GPs (adjusted mean difference 3.32; 95% CI 0.99, 5.65). These results suggested that all other HCP groups (nurses/ health visitors, pharmacists, and other) had lower mean practice scores than GPs. The practice mean score was -2.78 (95% CI -4.54, -1.03) lower for current or ex-smokers compared to never smokers in the adjusted model.

Table 4.3: Mean composite score for overall practice and the association with respondent characteristics

Characteristic	**Mean composite overall practice score out of 25 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	11.70 (4.52)	N/A	N/A
Gender			
Female (n=104)	11.97 (4.58)	Reference	Reference
Male (n=54)	11.83 (4.05)	-0.14 (-1.60, 1.32)	0.42 (-1.19, 2.03)
Age			
≤34 years (n=44)	11.73 (4.63)	Reference	Reference
35-54 years (n=90)	12.01 (4.22)	0.28 (-1.32, 1.89)	-1.14 (-3.37, 1.09)
≥55 years (n=25)	11.84 (4.70)	0.11 (-2.07, 2.29)	-1.35 (-4.23, 1.52)
Ethnicity			
White (n=105)	11.82 (4.02)	Reference	Reference
All other (n=46)	12.09 (5.24)	0.27 (-1.28, 1.81)	-0.17 (-1.78, 1.44)
Highest qualification			
Higher degree (n=45)	13.09 (4.76)	Reference	Reference
All other (n=113)	11.45 (4.17)	-1.64 (-3.15, -0.13)*	-1.97 (-3.54, -0.39)*
Type of HCP			
General Practitioner (n=55)	11.87 (3.16)	Reference	Reference
Nurse or Health Visitor (n=33)	14.12 (5.12)	2.25 (0.43, 4.07)*	3.32 (0.99, 5.65)**
Pharmacist (n=25)	11.36 (4.76)	-0.79 (-2.81, 1.23)	-1.10 (-3.57, 1.38)
Other (n=44)	10.50 (4.25)	-1.37 (-3.04, 0.30)	-0.86 (-3.01, 1.29)
Current work setting			
Primary care (n=80)	12.03 (3.80)	Reference	Reference
Community care (n=92)	11.41 (5.06)	-0.61 (-1.98, 0.75)	-0.52 (-2.23, 1.19)
Length of employment in primary or community care sector			
>10 years (n=86)	12.20 (4.28)	Reference	Reference
4-10 years (n=35)	11.80 (4.55)	-0.40 (-2.14, 1.35)	-0.38 (-2.27, 1.52)

≤3 years (n=37)	11.41 (4.55)	-0.79 (-2.50, 0.92)	-1.61 (-3.96, 0.75)
Smoking status Never smoked (n=127) Current or Ex-smoker (n=31)	 12.27 (4.23) 10.35 (4.78)	 Reference -1.91 (-3.63, -0.20)*	 Reference -2.78 (-4.54, -1.03)***

CI: confidence interval; HCP: healthcare professional, N: number; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.2.3 Association between respondent characteristics and 'good' practice

Unadjusted binary logistic regression analysis did not identify any respondent characteristics which were statistically significantly associated with 'good' overall practice around SHSe (see Table 4.4).

Table 4.4: Number of respondents with composite scores indicative of 'good' overall practice and the association with respondent characteristics

Characteristic	**N (%) 'good' overall practice**	**Unadjusted OR (95% CI)**
All	6 (3.60)	N/A
Gender Female (n=102) Male (n=54)	 4 (3.92) 2 (3.70)	 Reference 0.94 (0.17, 5.32)
Age ≤34 years (n=42) 35-54 years (n=90) ≥55 years (n=25)	 2 (4.76) 4 (4.44) 0 (0.00)	 Reference 0.93 (0.16, 5.29) N/A
Ethnicity White (n=104) All other (n=45)	 2 (1.90) 3 (6.00)	 Reference 1.16 (0.21, 6.59)
Highest qualification		

Higher degree (n=45)	3 (6.67)	Reference
All other (n=111)	3 (2.65)	2.57 (0.50, 13.25)
Type of HCP		
General Practitioner (n=55)	1 (1.82)	Reference
Nurse or Health Visitor (n=32)	2 (6.25)	3.60 (0.31, 41.37)
Pharmacist (n=25)	1 (4.00)	2.25 (0.14, 37.49)
Other (n=43)	1 (2.33)	1.29 (0.08, 21.16)
Current work setting		
Primary care (n=80)	3 (3.75)	Reference
Community care (n=89)	3 (3.37)	0.90 (0.18, 4.57)
Length of employment in primary or community care sector		
>10 years (n=86)	3 (3.49)	Reference
4-10 years (n=35)	2 (5.71)	1.68 (0.27, 10.50)
≤3 years (n=35)	1 (2.70)	0.81 (0.08, 8.10)
Smoking status		
Never smoked (n=125)	4 (3.20)	Reference
Current or Ex-smoker (n=31)	2 (6.45)	2.09 (0.36, 11.95)

CI: confidence interval; HCP: healthcare professional; N: number; OR: odds ratio

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

4.3.3 'Ask' Practices

4.3.3.1 Descriptive statistical analysis

The majority of respondents reported that they 'never' or 'rarely' asked non-smokers (62.2%) or smokers (56.1%) about SHSe and SHS in the home. Some respondents reported 'sometimes' asking non-smokers (24.4%) or smokers (27.5%) about SHSe and SHS in the home (see Figure 4.1). The mean composite score for the 'ask' statements was 4.7 (SD 1.9) out of a maximum score of 10. Only 15 respondents (8.8%) reported 'good' practice (i.e. 'often' or 'always' asking about SHS with both non-smokers and smokers).

4.3.3.2 Association between respondent characteristics and mean score for 'Ask' practices

As with overall practice, the level of qualification, type of healthcare profession, and smoking status of the respondents were seen to affect the mean scores on asking practices (see Table 4.5). Respondents who did not have a higher degree had a lower mean score compared to those with a higher degree (unadjusted mean difference -0.78 (95% CI -1.44, -0.12)). Nurses and health visitors' scores were significantly higher for asking practices compared to GPs (unadjusted mean difference 1.05 (95% CI 0.27, 1.83)). Current and ex-smokers' mean score was significantly lower than never smokers (unadjusted mean difference -0.80; 95% CI -1.56, -0.05).

The difference in mean score showed a strengthened association for all three of these factors when the model was adjusted for the other respondent characteristics. Respondents who did not have a higher degree had a lower mean score in comparison to those with a higher a degree according to the adjusted model as well (adjusted mean difference -1.00 (95% CI -1.67, -0.33)). Nurses and health visitors' scores were significantly higher for asking

practices compared to GPs (adjusted mean difference 1.49 (95% CI 0.50, 2.47)). In addition, pharmacists' mean score for asking-related practices became statistically significant in the adjusted model (-1.10 (95% CI -2.15, -0.05)). Current and ex-smokers' mean score was significantly lower than the never smokers in the adjusted models (adjusted mean difference -1.22 (95% CI -1.96, -0.48)).

Table 4.5: Mean composite score for 'Ask' practices and the association with respondent characteristics

Characteristic	**Mean composite 'Ask' score out of 10 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	4.68 (1.95)	N/A	N/A
Gender			
Female (n=104)	4.82 (2.06)	Reference	Reference
Male(n=54)	4.61 (1.68)	-0.21 (-0.85, 0.44)	0.12 (-0.57, 0.80)
Age			
≤34 years (n=44)	4.82 (1.93)	Reference	Reference
35-54 years (n=90)	4.73 (1.92)	-0.09 (-0.79, 0.62)	-0.73 (-1.67, 0.22)
≥55 years (n=25)	4.68 (2.01)	-0.14 (-1.10, 0.82)	-0.76 (-1.98, 0.46)
Ethnicity			
White (n=105)	4.72 (1.76)	Reference	Reference
All other (n=46)	4.76 (2.27)	0.04 (-0.64, 0.71)	-0.14 (-0.82, 0.55)
Highest qualification			
Higher degree (n=45)	5.31 (1.98)	Reference	Reference
All other (n=113)	4.53 (1.88)	-0.78 (-1.44, -0.12)*	-1.00 (-1.67, -0.33) ***
Type of HCP			
General Practitioner (n=55)	4.80 (1.25)	Reference	Reference
Nurse or Health Visitor (n=33)	5.85 (2.31)	1.05 (0.27, 1.83)**	1.49 (0.50, 2.47)***
Pharmacist (n=25)	4.12 (1.92)	-0.84 (-1.71, 0.03)	-1.10 (-2.15, -0.05)*

Other (n=44)	4.18 (1.96)	-0.62 (-1.34, 0.10)	-0.47 (-1.38, 0.44)
Current work setting Primary care (n=80) Community care (n=92)	 4.80 (1.66) 4.58 (2.17)	 Reference -0.22 (-0.81, 0.37)	 Reference -0.17 (-0.89, -0.56)
Length of employment in primary or community care sector >10 years (n=86) 4-10 years (n=35) ≤3 years (n=37)	 4.79 (1.90) 4.69 (1.97) 4.76 (1.99)	 Reference -0.11 (-0.87, 0.66) -0.03 (-0.79, 0.72)	 Reference -0.05 (-0.85, 0.76) -0.51 (-1.50, 0.49)
Smoking status Never smoked (n=127) Current or Ex-smoker (n=31)	 4.90 (1.88) 4.10 (2.04)	 Reference -0.80 (-1.56, -0.05)*	 Reference -1.22 (-1.96, -0.48) ***

CI: confidence interval; HCP: healthcare professional, N: number; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.3.3 Association between respondent characteristics and 'good' practice to 'Ask'

Nurses and health visitors were six times more likely to have 'good' asking practices than GPs (adjusted OR 6.12 (95% CI 1.15, 32.41)). However, it should be noted that the confidence intervals were very wide due to the low number of respondents (Table 4.6).

Table 4.6: Number of respondents with composite scores indicative of 'good' practice to 'Ask' and the association with respondent characteristics

Characteristic	**N (%) 'good' practice to 'Ask'**	**Unadjusted OR (95% CI)**
All	15 (8.80)	N/A
Gender Female (n=103) Male(n=54)	 11 (10.58) 4 (7.41)	 Reference 0.67 (0.20, 2.21)

Age		
≤34 years (n=43)	4 (9.09)	Reference
35-54 years (n=90)	10 (11.11)	1.22 (0.36, 4.13)
≥55 years (n=25)	1 (4.00)	0.41 (0.04, 3.85)
Ethnicity		
White (n=105)	10 (9.52)	Reference
All other (n=45)	4 (8.89)	0.93 (0.28, 3.13)
Highest qualification		
Higher degree (n=45)	7 (15.56)	Reference
All other (n=112)	8 (7.08)	2.40 (0.81, 7.05)
Type of HCP		
General Practitioner (n=55)	2 (3.64)	Reference
Nurse or Health Visitor (n=32)	6 (18.18)	6.12 (1.15, 32.41)*
Pharmacist (n=25)	3 (12.00)	3.61 (0.56, 23.14)
Other (n=44)	3 (6.82)	1.94 (0.31, 12.15)
Current work setting		
Primary care (n=80)	7 (8.75)	Reference
Community care (n=91)	8 (8.79)	1.01 (0.35, 2.91)
Length of employment in primary or community care sector		
>10 years (n=86)	8 (9.30)	Reference
4-10 years (n=35)	4 (11.43)	1.26 (0.35, 4.48)
≤3 years (n=36)	3 (8.11)	0.89 (0.22, 3.55)
Smoking status		
Never smoked (n=126)	12 (9.52)	Reference
Current or Ex-smoker (n=31)	3 (9.68)	1.02 (0.27, 3.85)

CI: confidence interval; HCP: healthcare professional; n: number; OR: odds ratio

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

4.3.4 'Advise' Practices

4.3.4.1 Descriptive statistical analysis

Two of the survey statements assessed respondents' practices in providing advice related to SHS: providing information on the health effects of SHSe and delivering harm reduction messages to smokers (Figure 4.1). Over half of the respondents reported 'never' or 'rarely' offering information (57.9%) or delivering harm reduction messages (53.5%). Some respondents reported they only 'sometimes' gave information on the health effects (25.1%) or 'sometimes' delivered SHS harm reduction messages (30.0%). The mean composite score calculated for both statements relating to advising on SHS was 4.8 (SD 2.1) out of a maximum score of 10. Of the 172 respondents, only 20 (11.8%) scored a composite value indicative of 'good' advising practices (i.e., 20 respondents indicated they 'often' or 'always' advised in response to the survey statements posed, giving them a score of 4 or 5 to each of the two statements).

4.3.4.2 Association between respondent characteristics and mean score for 'Advise' practices

Similar to the overall practice mean scores, the mean scores for advising practices were lower for those without a higher degree (unadjusted mean difference -0.71 (95% CI -1.42, -0.00)) and for those who reported being a current or ex-smoker (unadjusted mean difference -1.05 (95% CI -1.85, -0.25)). Nurses and health visitors showed a higher mean score than GPs (unadjusted mean difference 1.35 (95% CI 0.23, 2.46)). These associations were seen to strengthen when the model was adjusted for all of the respondent characteristics (Table 4.7). The mean difference remained lower for those without a higher degree (adjusted mean difference -0.81 (95% CI -1.56, -0.05)); and for those who reported

being a current or ex-smoker (adjusted mean difference -1.38 (95% CI -2.22, -0.54)). The higher mean score estimated for nurses and health visitors was also strengthened compared to GPs (adjusted mean difference 1.35 (95% CI 0.23, 2.46)).

Table 4.7: Mean composite score for 'Advise' practices and the association with respondent characteristics

Characteristic	**Mean composite 'Advise' score out of 10 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	4.77 (2.09)	N/A	N/A
Gender			
Female (n=104)	4.88 (2.16)	Reference	Reference
Male(n=54)	4.81 (1.81)	-0.07 (-0.75, 0.61)	0.12 (-0.65, 0.89)
Age			
≤34 years (n=44)	4.84 (2.11)	Reference	Reference
35-54 years (n=90)	4.81 (1.98)	-0.03 (-0.78, 0.72)	-0.36 (-1.43, 0.70)
≥55 years (n=25)	4.96 (2.26)	0.12 (-0.90, 1.14)	-0.20 (-1.58, 1.17)
Ethnicity			
White (n=105)	4.74 (1.88)	Reference	Reference
All other (n=46)	5.17 (2.43)	0.43 (-0.29, 1.15)	0.15 (-0.62, 0.92)
Highest qualification			
Higher degree (n=45)	5.35 (2.22)	Reference	Reference
All other (n=113)	4.65 (1.96)	-0.71 (-1.42, -0.00)*	-0.81 (-1.56, -0.05)*
Type of HCP			
General Practitioner (n=55)	4.73 (1.64)	Reference	Reference
Nurse or Health Visitor (n=33)	5.79 (2.39)	1.06 (0.19, 1.93)*	1.35 (0.23, 2.46)**
Pharmacist (n=25)	4.76 (2.17)	-0.02 (-0.98, 0.95)	-0.28 (-1.47, 0.90)
Other (n=44)	4.30 (1.96)	-0.43 (-1.23, 0.37)	-0.36 (-1.39, 0.66)
Current work setting			
Primary care (n=80)	4.80 (1.75)	Reference	Reference

Community care (n=91)	4.75 (2.37)	-0.05 (-0.69, 0.58)	-0.13 (-0.94, 0.69)
Length of employment in primary or community care sector			
>10 years (n=86)	4.93 (2.05)	Reference	Reference
4-10 years (n=35)	4.74 (2.02)	-0.19 (-1.01, 0.63)	-0.21 (-1.11, 0.70)
≤3 years (n=37)	4.76 (2.14)	-0.17 (-0.98, 0.63)	-0.44 (-1.57, 0.68)
Smoking status			
Never smoked (n=127)	5.05 (2.00)	Reference	Reference
Current or Ex-smoker (n=31)	4.00 (2.08)	-1.05 (-1.85, -0.25)**	-1.38 (-2.22, -0.54)***

CI: confidence interval; HCP: healthcare professional; n: number; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.4.3 Association between respondent characteristics and 'good' practice to 'Advise'

Unadjusted binary logistic regression (see Table 4.8) showed that nurses and health visitors were six times more likely to report 'good' advice-related practices in relation to SHS than the reference group of GPs (OR 6.50; 95% CI 1.61, 26.18). This was statistically significant, although the estimate lacked precision given the wide confidence interval.

Table 4.8: Number of respondents with composite scores indicative of 'good' practice to 'Advise' and the association with respondent characteristics

Characteristic	**N (%) 'good' practice to 'Advise'**	**Unadjusted OR (95% CI)**
All	20 (11.80)	N/A
Gender		
Female (n=102)	15 (14.42)	Reference
Male (n=54)	4 (7.41)	0.46 (0.15, 1.48)
Age		
≤34 years (n=43)	6 (13.95)	Reference

35-54 years (n=89)	9 (10.11)	0.69 (0.23, 2.09)
≥55 years (n=25)	4 (16.00)	1.18 (0.30, 4.64)
Ethnicity		
White (n=103)	10 (9.52)	Reference
All other (n=46)	9 (19.57)	2.26 (0.85, 6.01)
Highest qualification		
Higher degree (n=45)	7 (15.56)	Reference
All other (n=111)	12 (10.62)	1.52 (0.56, 4.15)
Type of HCP		
General Practitioner (n=55)	3 (5.45)	Reference
Nurse or Health Visitor (n=33)	9 (27.27)	6.50 (1.61, 26.18)**
Pharmacist (n=25)	2 (8.00)	1.51 (0.24, 9.64)
Other (n=42)	4 (9.09)	1.83 (0.39, 8.63)
Current work setting		
Primary care (n=79)	6 (7.50)	Reference
Community care (n=90)	14 (15.56)	2.24 (0.82, 6.15)
Length of employment in primary or community care sector		
>10 years (n=86)	11 (12.79)	Reference
4-10 years (n=35)	4 (11.43)	0.88 (0.26, 2.98)
≤3 years (n=35)	4 (10.81)	0.88 (0.26, 2.98)
Smoking status		
Never smoked (n=125)	17 (13.60)	Reference
Current or Ex-smoker (n=31)	2 (6.45)	0.44 (0.10, 2.01)

CI: confidence interval; HCP: healthcare professional; N: number; OR: odds ratio

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

4.3.5 'Act' Practices

4.3.5.1 Descriptive statistical analysis

The final practice statement (see Figure 4.1) asked respondents to indicate the frequency of acting to support smokers to reduce SHSe levels (e.g., prescription of smoking cessation medication). Similar to the other practices, over half of the respondents reported 'never' and 'rarely' acting (32.2% and 22.8%), with 31.0% reported 'sometimes' acting. The mean score was 2.3 (SD 1.1) out of a maximum score of 5. Only 24 respondents (14.0%) had a mean score indicative of 'good' practice, i.e., they 'often' or 'always' acted.

4.3.5.2 Association between respondent characteristics and mean score for 'Act' practices

Few differences were seen in the mean scores for acting-related practice between the different respondent characteristic groups (see Table 4.9). There was a small reduction in acting mean score for those who had been employed in either the primary/community sectors for 3 years or less in comparison to those with longer employment lengths (unadjusted mean difference -0.59; 95% CI -1.01, -0.17). This remained significant after the model was adjusted for all of the other respondent characteristics (adjusted mean difference -0.65; 95% CI -1.28, -0.03).

Table 4.9: Mean composite score for 'Act' practices and the association with respondent characteristics

Characteristic	**Mean composite 'Act' score out of 5 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	2.29 (1.10)	N/A	N/A
Gender Female (n=104) Male (n=54)	 2.27 (1.05) 2.41 (1.19)	 Reference 0.14 (-0.23, 0.50)	 Reference 0.18 (-0.25, 0.61)

Age			
≤34 years (n=44)	2.07 (1.19)	Reference	Reference
35-54 years (n=90)	2.47 (1.09)	0.40 (0.00, 0.79)*	-0.05 (-0.64, 0.54)
≥55 years (n=25)	2.20 (0.87)	0.13 (-0.41, 0.67)	-0.39 (-1.15, 0.37)
Ethnicity			
White (n=105)	2.35 (1.06)	Reference	Reference
All other (n=46)	2.15 (1.19)	-0.20 (-0.58, 0.18)	-0.19 (-0.62, 0.24)
Highest qualification			
Higher degree (n=45)	2.42 (1.16)	Reference	Reference
All other (n=113)	2.27 (1.08)	-0.15 (-0.53, 0.24)	-0.15 (-0.57, 0.27)
Type of HCP			
General Practitioner (n=55)	2.35 (1.09)	Reference	Reference
Nurse or Health Visitor (n=33)	2.48 (0.87)	0.14 (-0.33, 0.61)	0.48 (-1.14, 1.10)
Pharmacist (n=25)	2.48 (1.26)	0.07 (-0.45, 0.60)	0.29 (-0.37, 0.95)
Other (n=44)	2.02 (1.13)	-0.32 (-0.76, 0.11)	-0.02 (-0.59, 0.55)
Current work setting			
Primary care (n=80)	2.43 (1.12)	Reference	Reference
Community care (n=91)	2.16 (1.07)	-0.26 (-0.59, 0.07)	-0.23 (-0.68, 0.23)
Length of employment in primary or community care sector			
>10 years (n=86)	2.48 (1.10)	Reference	Reference
4-10 years (n=35)	2.37 (1.06)	-0.11 (-0.53, 0.32)	-0.13 (-0.63, 0.38)
≤3 years (n=37)	1.89 (1.05)	-0.59 (-1.01, -0.17)**	-0.65 (-1.28, -0.03)*
Smoking status			
Never smoked (n=127)	2.32 (1.10)	Reference	Reference
Current or Ex-smoker (n=31)	2.26 (1.09)	-0.07 (-0.50 – 0.37)	-0.18 (-0.65, 0.28)

CI: confidence interval; HCP: healthcare professional; n: number; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.5.3 Association between respondent characteristics and 'good' practice to 'Act'

In unadjusted binary logistic regression (Table 4.10), HCPs who reported working in community settings were significantly less likely to act (on an often or always basis) than those based in primary care settings (unadjusted OR 0.39; 95% CI 0.16, 0.97).

Table 4.10: Number of respondents with composite scores indicative of 'good' practice to 'Act' and the association with respondent characteristics

Characteristic	**N (%) 'good' practice to 'Act'**	**Unadjusted OR (95% CI)**
All	24 (14.10)	N/A
Gender		
Female (n=104)	11 (10.58)	Reference
Male(n=54)	12 (22.22)	2.42 (0.99, 5.92)
Age		
≤34 years (n=44)	7 (15.91)	Reference
35-54 years (n=90)	15 (16.67)	1.06 (0.40, 2.82)
≥55 years (n=25)	1 (4.00)	0.22 (0.03, 1.91)
Ethnicity		
White (n=105)	14 (13.33)	Reference
All other (n=46)	7 (15.22)	1.17 (0.44, 3.11)
Highest qualification		
Higher degree (n=45)	8 (17.78)	Reference
All other (n=113)	15 (13.27)	1.41 (0.55, 3.61)
Type of HCP		
General Practitioner (n=55)	9 (16.36)	Reference
Nurse or Health Visitor (n=33)	3 (9.09)	0.51 (0.13, 2.04)
Pharmacist (n=25)	6 (24.00)	1.61 (0.50, 5.17)
Other (n=44)	4 (9.09)	0.51 (0.15, 1.79)
Current work setting		
Primary care (n=80)	16 (20.00)	Reference

Community care (n=90)	8 (8.89)	0.39 (0.16, 0.97)*
Length of employment in primary or community care sector		
>10 years (n=86)	15 (17.44)	Reference
4-10 years (n=35)	5 (14.29)	0.79 (0.26, 2.37)
≤3 years (n=37)	3 (8.11)	0.42 (0.11, 1.54)
Smoking status		
Never smoked (n=127)	19 (14.96)	Reference
Current or Ex-smoker (n=31)	4 (12.90)	0.84 (0.27, 2.68)

CI: confidence interval; HCP: healthcare professional; N: number; OR: odds ratio

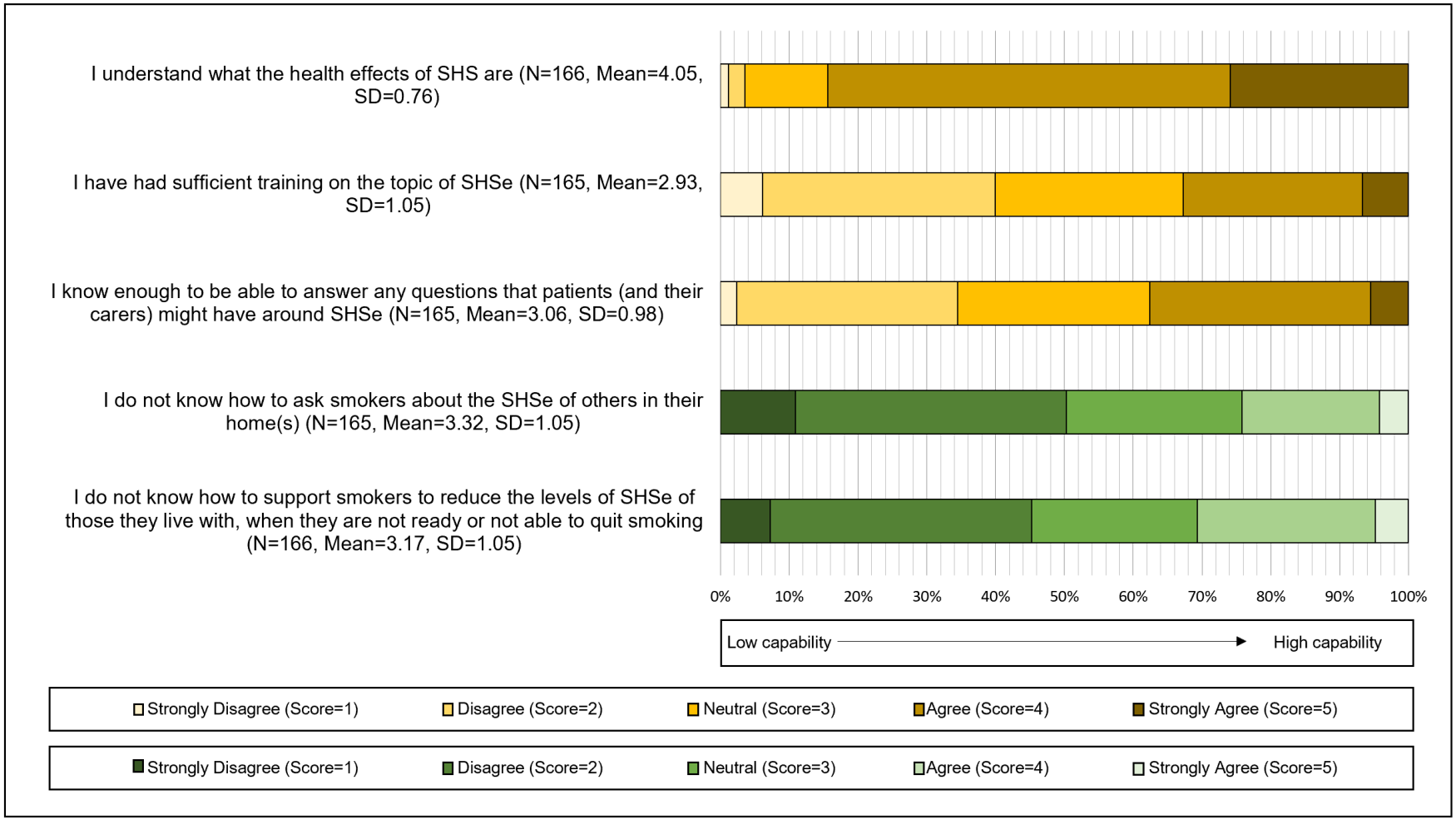
*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

4.3.6 Capability

4.3.6.1 Descriptive statistical analysis

Five statements assessed the capability to intervene around the topic of SHSe (see Figure 4.2). The mean composite score for capability statements was 16.5 (SD 3.5) out of a total possible score of 25. Only 28 (17.2%) of respondents reported having a 'high' level of capability to intervene around SHSe. The majority of respondents (74.1%) either 'agreed' or 'strongly agreed' that they understood what the health effects of SHS are. The responses were split between 'agree', 'neutral' and 'disagree' (26.1%, 27.3% and 33.9% respectively) for the statements concerning whether they have had sufficient training on the topic of SHSe, as well as, for the statement around being able to answer any questions around SHS (32.1%, 27.9%, and 32.1% respectively). Most respondents disagreed with the proposed statement about not knowing how to ask smokers about SHSe. However, there remained a large number who responded with 'neutral' (25.5%) or 'agree' (20.0%) to this statement. Similarly, most respondents (38.0%) disagreed with the statement concerning not knowing how to support smokers to reduce SHSe levels for those they live with. There were a large number of respondents who answered 'neutral' (24.1%) and 'agree' (25.9%) in response to this statement.

Figure 4.2: Summary of responses to statements concerning the capability to intervene around SHSe



N: number; SD: standard deviation; SHSe: secondhand smoke exposure

4.3.6.2 Association between respondent characteristics and mean capability score

Those who did not have a higher degree as the highest qualification reported lower mean scores in relation to their capability to intervene around SHSe (unadjusted mean difference -1.25; 95% CI -2.49, -0.02). This was the only statistically significant factor in the unadjusted models (Table 4.11). This observation remained statistically significant in the adjusted model (adjusted mean difference -2.06; 95% CI -3.40, -0.73).

Table 4.11: Mean composite score for capability level and the association with respondent characteristics

Characteristic	**Mean composite capability score out of 25 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	16.49 (3.54)	N/A	N/A
Gender			
Female (n=104)	16.14 (3.41)	Reference	Reference
Male (n=54)	17.26 (3.80)	1.12 (-0.06, 2.29)	1.15 (-0.21, 2.51)
Age			
≤34 years (n=44)	16.50 (4.11)	Reference	Reference
35-54 years (n=90)	16.52 (3.41)	0.02 (-1.28, 1.33)	-0.94 (-2.82, 0.94)
≥55 years (n=25)	16.56 (3.20)	0.06 (-1.72, 1.84)	-0.84 (-3.26, 1.59)
Ethnicity			
White (n=105)	16.34 (3.32)	Reference	Reference
All other (n=46)	17.24 (3.94)	0.90 (-0.33, 2.13)	0.98 (-0.38, 2.34)
Highest qualification			
Higher degree (n=45)	17.42 (3.95)	Reference	Reference
All other (n=113)	16.17 (3.37)	-1.25 (-2.49, -0.02)*	-2.06 (-3.40, -0.73)***
Type of HCP			
General Practitioner (n=55)	16.93 (3.47)	Reference	Reference

Nurse or Health Visitor (n=33)	16.88 (3.84)	-0.05 (-1.61, 1.52)	0.23 (-1.74, 2.19)
Pharmacist (n=25)	16.48 (2.87)	-0.51 (-2.25, 1.23)	-1.62 (-3.70, 0.47)
Other (n=44)	15.77 (3.87)	-1.16 (-2.59, 0.28)	-1.21 (-3.02, 0.60)
Current work setting			
Primary care (n=80)	16.64 (3.45)	Reference	Reference
Community care (n=86)	16.36 (3.64)	-0.28 (-1.37, 0.81)	-0.05 (-1.49, 1.39)
Length of employment in primary or community care sector			
>10 years (n=86)	16.81 (3.33)	Reference	Reference
4-10 years (n=35)	16.09 (3.51)	-0.73 (-2.14, 0.68)	-0.44 (-2.03, 1.16)
≤3 years (n=37)	16.41 (4.08)	-0.41 (-1.79, 0.97)	-1.17 (-3.16, 0.81)
Smoking status			
Never smoked (n=127)	16.69 (3.54)	Reference	Reference
Current or Ex-smoker (n=31)	16.06 (3.56)	-0.62 (-2.02, 0.78)	-0.59 (-2.07, 0.89)

CI: confidence interval; HCP: healthcare professional; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.6.3 Association between respondent characteristics and 'high' capability level

Unadjusted binary logistic regression did not identify any variables that had a significant effect on the odds of respondents reporting good levels of capability (Table 4.12).

Table 4.12: Number of respondents with composite scores indicative of 'high' capability level to intervene around SHSe and the association with respondent characteristics

Characteristic	**N (%) 'high' capability**	**Unadjusted OR (95% CI)**
All	28 (17.20)	N/A
Gender		
Female (n=102)	16 (15.69)	Reference

Male(n=53)	12 (22.64)	1.57 (0.68, 3.63)
Age		
≤34 years (n=44)	10 (22.73)	Reference
35-54 years (n=88)	14 (15.91)	0.64 (0.26, 1.59)
≥55 years (n=24)	4 (16.00)	0.68 (0.19, 2.46)
Ethnicity		
White (n=103)	15 (14.29)	Reference
All other (n=45)	12 (26.67)	2.13 (0.90, 5.03)
Highest qualification		
Higher degree (n=44)	9 (20.45)	Reference
All other (n=111)	19 (17.12)	1.25 (0.52, 3.01)
Type of HCP		
General Practitioner (n=53)	11 (20.00)	Reference
Nurse or Health Visitor (n=33)	7 (21.21)	1.03 (0.35, 2.99)
Pharmacist (n=25)	2 (8.00)	0.33 (0.07, 1.63)
Other (n=43)	8 (18.18)	0.87 (0.32, 2.41)
Current work setting		
Primary care (n=79)	15 (18.75)	Reference
Community care (n=84)	13 (15.48)	0.78 (0.35, 1.77)
Length of employment in primary or community care sector		
>10 years (n=84)	12 (14.29)	Reference
4-10 years (n=34)	8 (23.53)	1.85 (0.68, 5.02)
≤3 years (n=37)	8 (21.62)	1.66 (0.61, 4.47)
Smoking status		
Never smoked (n=124)	24 (19.35)	Reference
Current or Ex-smoker (n=31)	4 (12.90)	0.62 (0.20, 1.93)

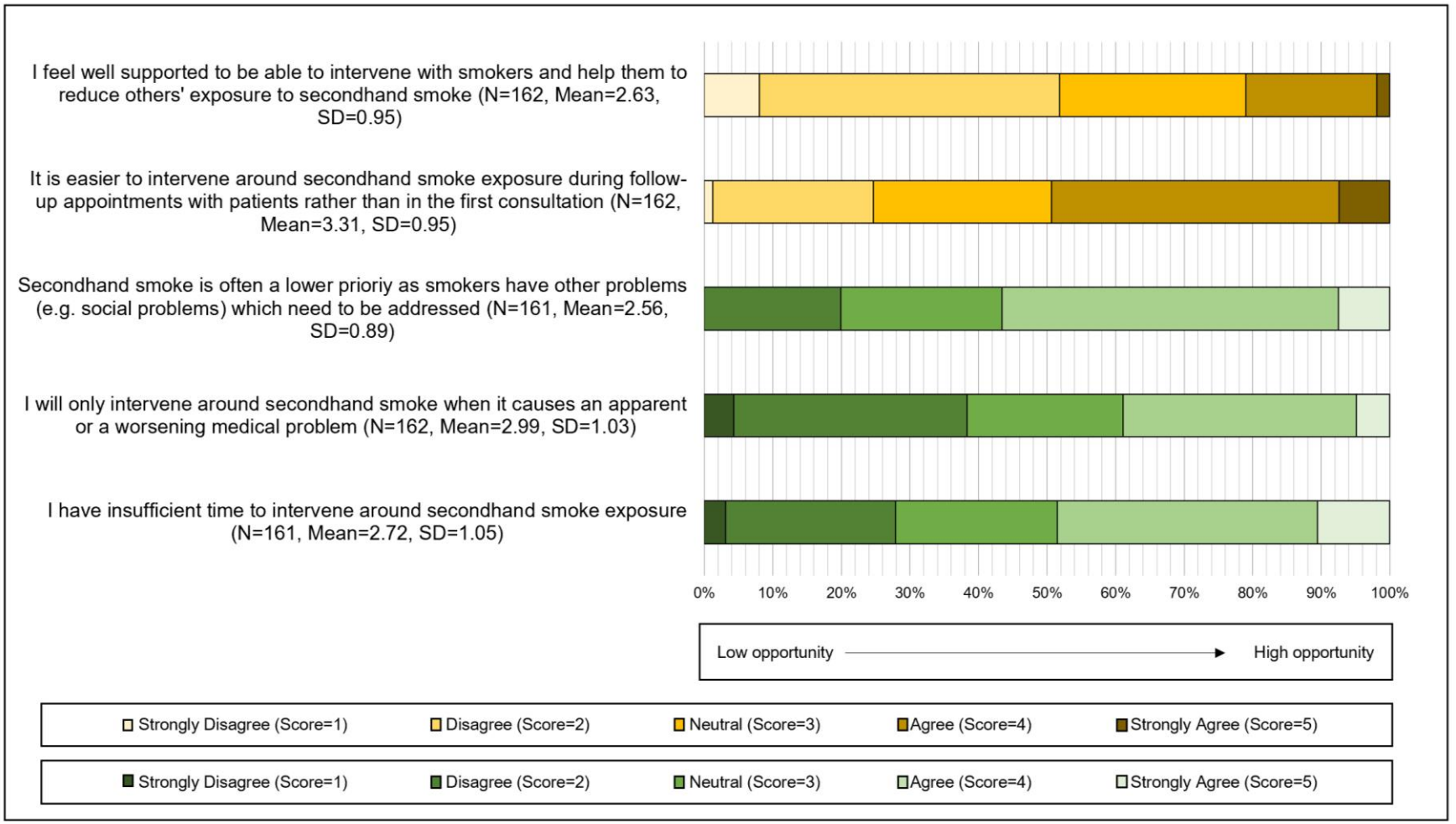
(CI: confidence interval; HCP: healthcare professional; OR: odds ratio; SHSe: secondhand smoke exposure)

4.3.7 Opportunity

4.3.7.1 Descriptive statistical analysis

Respondents were asked to rate their level of (dis)agreement with statements pertaining to opportunities to intervene around SHSe (see Figure 4.3). The mean composite score was found to be 10.9 (SD 2.6) out of a possible 20. The composite scores identified 3 respondents (1.9%) who reported a 'high' level of opportunity to intervene. The largest group of respondents (42.0%) 'agreed' that it is easier to intervene around SHSe during follow-up appointments rather than during a patient's first consultation. However, there was also a large proportion who selected 'neutral' (25.9%) or 'disagree' (23.5%) in response to this statement. There was a similarly broad range of responses to two of the negatively worded statements: 37.9% of respondents ''agreed that they had insufficient time to intervene around SHSe; however, 24.8% of respondents 'disagreed' with this same statement and 23.6% selected a 'neutral' response. There was an equal divide among the respondents (34.0% each) who 'agreed' and who 'disagreed' that they would only intervene around SHS when it caused an apparent or worsening medical condition. Almost half of the respondents (49.1%) 'agreed' that SHS was often a lower priority as smokers have other problems that need to be addressed. Moreover, whilst 19.9% 'disagreed' and 23.6% remained 'neutral', no respondents 'strongly disagreed' with this statement concerning the priority of the issue. Only 19.7% of respondents 'agreed' (18.0%) and 'strongly agreed' (1.7%) that they felt well supported to intervene with smokers to help them reduce SHSe levels.

Figure 4.3: Summary of responses to statements concerning the opportunity to intervene around SHSe



N: number; SD: standard deviation; SHSe: secondhand smoke exposure

4.3.7.2 Association between respondent characteristics and mean opportunity score

Unadjusted linear regression highlighted one variable which reported a significantly different mean score for the opportunity within the characteristics (Table 4.13). With regards to the level of opportunity to intervene around SHSe, nurses and health visitors had the highest mean score of all the different occupational groups when compared to GPs (unadjusted mean difference 1.88; 95% CI 0.80, 2.96). This finding remained statistically significant in the adjusted model (adjusted mean difference 1.7; 95% CI 0.28, 3.14).

Table 4.13: Mean composite score for opportunity level and the association with respondent characteristics

Characteristic	**Mean composite opportunity score out of 20 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	10.86 (2.57)	N/A	N/A
Gender			
Female (n=104)	11.10 (2.58)	Reference	Reference
Male(n=54)	10.39 (2.56)	-0.71 (-1.56, 0.15)	-0.26 (-1.24, 0.73)
Age			
≤34 years (n=44)	10.86 (2.72)	Reference	Reference
35-54 years (n=90)	10.89 (2.54)	0.03 (-0.92, 0.97)	-0.94 (-2.30, 0.43)
≥55 years (n=25)	10.84 (2.66)	-0.02 (-1.31, 1.27)	-1.20 (-2.97, 0.56)
Ethnicity			
White (n=105)	10.77 (2.40)	Reference	Reference
All other (n=46)	11.35 (2.92)	0.58 (-0.32, 1.47)	0.39 (-0.60, 1.38)
Highest qualification			
Higher degree (n=45)	11.04 (2.62)	Reference	Reference
All other (n=113)	10.83 (2.58)	-0.21 (-1.12, 0.69)	-0.15 (-1.12, 0.83)
Type of HCP			
General Practitioner (n=55)	10.45 (2.53)	Reference	Reference

Nurse or Health Visitor (n=33)	12.33 (2.43)	1.88 (0.80, 2.96)***	1.71 (0.28, 3.14)*
Pharmacist (n=25)	11.16 (2.30)	0.75 (-0.45, 1.96)	0.22 (-1.30, 1.74)
Other (n=44)	10.16 (2.55)	-0.30 (-1.29, 0.70)	-0.45 (-1.77, 0.87)
Current work setting			
Primary care (n=80)	10.65 (2.42)	Reference	Reference
Community care (n=82)	11.07 (2.71)	0.42 (-0.37, 1.22)	0.08 (-0.97, 1.13)
Length of employment in primary or community care sector			
>10 years (n=86)	11.00 (2.54)	Reference	Reference
4-10 years (n=35)	11.06 (2.62)	0.06 (-0.97, 1.09)	-0.08 (-1.25, 1.08)
≤3 years (n=37)	10.49 (2.69)	-0.51 (-1.52, 0.49)	-1.40 (-2.84, 0.05)
Smoking status			
Never smoked (n=127)	10.91 (2.63)	Reference	Reference
Current or Ex-smoker (n=31)	10.90 (2.36)	-0.00 (-1.02, 1.02)	-0.23 (-1.31, 0.84)

CI: confidence interval; HCP: healthcare professional; n: number; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.7.3 Association between respondent characteristics and 'high' opportunity level

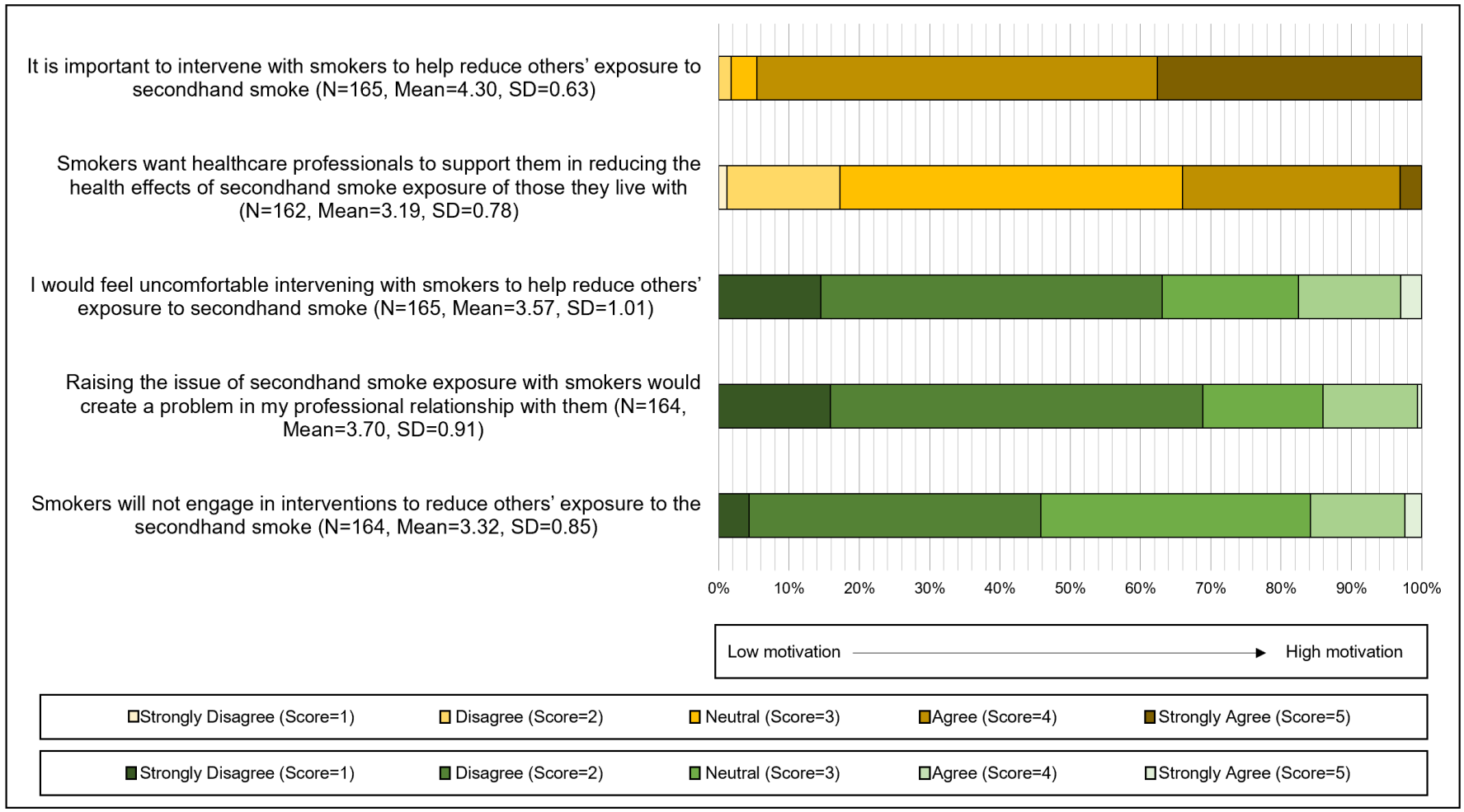
As only three respondents had a composite score indicative of having a 'high' opportunity to intervene, the data were too underpowered to be able to undertake a meaningful unadjusted binary logistic regression (Appendix 4.7).

4.3.8 Motivation

4.3.8.1 Descriptive statistical analysis

The mean composite score for motivation was 18.0 (SD 2.7) out of a maximum possible score of 25. These scores indicated 'high' motivation levels for 25 respondents (15.5%). The majority of respondents were in 'agreement' (90.7%) that intervening to support smokers to reduce SHSe for others is important (Figure 4.4). Indeed, no respondents 'strongly disagreed' to this statement and only 1.7% 'disagreed'. There was much less certainty with regards to whether smokers want support from HCPs; the largest group of respondents were in the 'neutral' category (45.9%) in response to this statement. Respondents most frequently 'disagreed' with the three negatively worded statements. Overall, 63.0% of respondents 'disagreed' and 'strongly disagreed' with the statement that they would feel uncomfortable intervening with smokers to help reduce others' exposure to SHS. Similarly, 68.9% 'disagreed' and 'strongly disagreed' with the statement 'raising the issue of SHSe with smokers would create a problem in [their] professional relationship'. For the statement, which concerned smokers' engagement with an intervention fewer than half of the respondents disagreed ('disagree': n=68, 41.5%; 'strongly disagree': n=7, 4.3%) with the statement; but a large proportion of the respondents (n=63, 38.4%) were in the 'neutral' category.

Figure 4.4: Summary of responses to statements concerning motivation to intervene around SHSe



N: number; SD: standard deviation; SHSe: secondhand smoke exposure

4.3.8.2 Association between respondent characteristics and mean motivation score

As shown in Table 4.14, HCPs who belonged to the 'other' group had a significantly lower mean score for motivation than GPs (unadjusted mean difference -1.74; 95% CI -2.81, -0.67). HCPs who worked in community care settings had a significantly lower mean score than those who reported working in the primary care sector (unadjusted mean difference -1.45; 95% CI -2.27, 0.64). After adjustment, the lower mean score in respondents who worked in the community sector compared with primary care remained significant (adjusted mean difference -1.23; 95% CI -2.36, -0.10).

Table 4.14: Mean composite score for motivation level and the association with respondent characteristics

Characteristic	**Mean composite motivation score out of 25 (SD)**	**Unadjusted mean difference (95% CI)**	**Adjusted mean difference† (95% CI)**
All	17.98 (2.74)	N/A	N/A
Gender			
Female (n=104)	18.06 (2.80)	Reference	Reference
Male (n=54)	18.02 (2.69)	-0.04 (-0.95, 0.88)	-0.42 (-1.48, 0.65)
Age			
≤34 years (n=44)	17.52 (3.24)	Reference	Reference
35-54 years (n=90)	18.18 (2.52)	0.66 (-0.35, 1.66)	-0.01 (-1.49, 1.47)
≥55 years (n=25)	18.36 (2.66)	0.84 (-0.52, 2.20)	0.26 (-1.66, 2.16)
Ethnicity			
White (n=105)	18.03 (2.39)	Reference	Reference
All other (n=46)	18.13 (3.59)	0.10 (-0.89, 1.08)	0.24 (-0.83, 1.31)
Highest qualification			
Higher degree (n=45)	18.00 (3.47)	Reference	Reference
All other (n=113)	18.07 (2.42)	0.07 (-0.89, 1.03)	-1.14 (-1.19, 0.91)
Type of HCP			

General Practitioner (n=55)	18.67 (2.24)	Reference	Reference
Nurse or Health Visitor (n=33)	18.70 (2.53)	0.02 (-1.14, 1.19)	0.67 (-0.88, 2.21)
Pharmacist (n=25)	17.60 (3.37)	-1.17 (-2.50, 0.12)	-0.70 (-2.34, 0.95)
Other (n=44)	16.93 (2.86)	-1.74 (-2.81, -0.67)***	-0.96 (-2.39, 0.47)
Current work setting			
Primary care (n=80)	18.73 (2.34)	Reference	Reference
Community care (n=85)	17.27 (2.91)	-1.45 (-2.27, -0.64)***	-1.23 (-2.36, -0.10)*
Length of employment in primary or community care sector			
>10 years (n=86)	18.38 (2.68)	Reference	Reference
4-10 years (n=35)	17.46 (2.03)	-0.93 (-2.02, 0.16)	-0.52 (-1.78, 0.74)
≤3 years (n=37)	17.73 (3.43)	-0.65 (-1.72, 0.42)	-0.37 (-1.93, 1.19)
Smoking status			
Never smoked (n=127)	18.21 (2.64)	Reference	Reference
Current or Ex-smoker (n=31)	17.29 (3.15)	-0.92 (-2.01, 0.17)	-1.06 (-2.23, 0.10)

CI: confidence interval; HCP: healthcare professional; n: number; SD: standard deviation

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

†Model was adjusted for all of the respondent characteristics reported in this table.

4.3.8.3 Association between respondent characteristics and 'high' motivation level

As shown in Table 4.15, no statistically significant associations were found in the unadjusted binary logistic regression for motivation, although 25 respondents had a composite score indicative of having a 'high' opportunity to intervene.

Table 4.15: Number of respondents with composite scores indicative of 'high' motivation level to intervene around SHSe and the association with respondent characteristics

Characteristic	**N (%) 'high' motivation**	**Unadjusted OR (95% CI)**
All	25 (15.50)	N/A
Gender		
Female (n=101)	18 (17.82)	Reference
Male(n=53)	7 (13.21)	0.70 (0.27, 1.80)
Age		
≤34 years (n=41)	6 (13.63)	Reference
35-54 years (n=89)	13 (14.61)	1.00 (0.35, 2.84)
≥55 years (n=25)	6 (24.00)	1.84 (0.52, 6.51)
Ethnicity		
White (n=103)	15 (14.29)	Reference
All other (n=44)	10 (22.73)	1.73 (0.71, 4.21)
Highest qualification		
Higher degree (n=43)	8 (18.60)	Reference
All other (n=111)	17 (15.04)	1.26 (0.50, 3.19)
Type of HCP		
General Practitioner (n=54)	11 (20.00)	Reference
Nurse or Health Visitor (n=33)	7 (21.21)	1.05 (0.36, 3.05)
Pharmacist (n=25)	3 (12.00)	0.53 (0.14, 2.11)
Other (n=41)	4 (9.09)	0.42 (0.12, 1.44)
Current work setting		
Primary care (n=78)	15 (18.75)	Reference
Community care (n=83)	10 (10.99)	0.58 (0.24, 1.37)
Length of employment in primary or community care sector		
>10 years (n=86)	14 (16.28)	Reference
4-10 years (n=34)	6 (17.65)	1.10 (0.39, 3.15)
≤3 years (n=34)	5 (14.71)	0.89 (0.29, 2.69)

Smoking status		
Never smoked (n=123)	20 (16.26)	Reference
Current or Ex-smoker (n=31)	5 (16.13)	0.99 (0.34, 2.89)

CI: confidence interval; HCP: healthcare professional; N: number; OR: odds ratio

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

4.4 Summary

The findings of this cross-sectional survey highlighted a lack of overall practices in relation to SHSe in primary care settings at present; most respondents reported they 'rarely' practised asked, advised, or acted about SHSe and few respondents reported 'good' practices overall. Of the three contributing factors (as per the COM-B Model[160]) which determine clinical practice behaviour regarding SHSe, respondents reported having higher motivation followed by their opportunity to intervene than their self-reported levels of capability to intervene. The type of HCP group and sector of work was seen to influence motivation levels towards intervening around SHSe. Opportunity was seen to be influenced by the HCP group type, whereas capability levels were seen to be influenced by HCPs' level of highest qualification.

Thesis objectives A, B, and C were addressed through the findings of this cross-sectional quantitative study. These findings contribute to the mixed-methods integrated synthesis presented in Chapter 6 and also in the thesis Discussion (Chapter 7) in answer to the overarching thesis aim and objectives. Furthermore, the findings are complemented by an exploration of these objectives through the use of one-to-one semi-structured interviews with HCPs and service users, as presented in the next thesis chapter (Chapter 5), which presents the findings of a qualitative primary research study.

CHAPTER 5:

DELIVERING **S**ECONDHAND **S**MOKE **I**NTERVENTIONS IN **P**RIMARY CARE (**DESSIP** STUDY)

A qualitative study involving semi-structured interviews was designed to build on the findings of the previous chapters, which have thus far presented the global and national picture of intervention practices and influences of this regarding SHSe. The study results presented herein provide an in-depth exploration of healthcare professionals' (HCPs') views around the use of primary care as a setting to deliver secondhand smoke exposure (SHSe) interventions. In addition to further exploring the reasoning for the thesis' earlier findings, HCPs' views are complemented in this chapter by the viewpoint of service users: offering another perspective to guide the answering of the thesis objectives. This study also explores recommendations for future practice thereby building on the findings around current practices which have summarised in Chapters 1 and 3. This chapter contributes to answering thesis objectives A,B,C, and D (Section 1.5.3).

5.1 Study overview

5.1.2 Study aim

This research study aimed to explore the delivery of SHS harm reduction interventions in primary care settings from the perspective of primary care HCPs and smoking service users using qualitative methods informed by the COM-B Model.

5.1.3 Study objectives

To achieve the research aim, the study sought an understanding of the following pre-defined objectives within two main participant groups:

Primary care-based healthcare professionals (HCPs):

1. To explore definitions of the vulnerable population(s) who may be at risk of SHSe in the home and to identify from HCPs' perspectives which patients are/would be the best patient groups to target with interventions to reduce harms related to SHSe.
2. To explore HCPs' experiences of, and current practices around, the delivery of SHS harm reduction messages.
3. To ascertain HCPs' levels of capability, opportunity and motivation to provide SHS-related harm reduction interventions in primary care settings to explain current intervention behaviours and to help contextualise recommendations for future interventions.
4. To explore HCPs' ideas for potential SHS harm reduction interventions that may be used in primary care settings.

Primary care service users who smoke in home environments where non-smokers are at risk of exposure to SHS:

1. To explore service users' experiences of and perceptions around receiving SHS harm reduction messages from primary care HCPs.
2. To explore service users' views on the acceptability of approaches and the delivery of SHS harm reduction interventions in primary care settings.

3. To explore participants' views on the content and components for SHS harm reduction interventions delivered in primary care settings.

5.2 Methods

5.2.1 Study design and theoretical framework

A qualitative study informed by the COM-B Model of behaviour change and using one-to-one semi-structured interviews has been presented for this component of the thesis.

A generic qualitative approach[199–201] was chosen to allow exploration of how primary care settings are being used and/or could be used to deliver SHS harm reduction messages. Due to the lack of existing research in this area and the need for the results to be reflective of the ideas of those who could potentially be involved in delivering and/or receiving any subsequent interventions, a qualitative approach was considered appropriate. The generic qualitative approach is well suited to studies which seek to understand the perspectives of the participants, particularly in relation to clinical issues.[200,201]

As reasoned in Chapter 2 (Methodology) a behaviour change-related theory was considered appropriate to underpin the study development and conduct. The COM-B model[161,202] was selected for this purpose. This model highlighted that behaviours (B) are influenced by three factors: capability (C), opportunity (O), and motivation (M).[161,202] Thus the delivery and therefore, receipt, of SHS harm reduction interventions in primary care settings would be influenced by the capability, opportunity and motivation of HCPs to deliver such interventions to service users. The COM-B Model is aligned with the generic qualitative

approach as it offers a theoretical structure which thereby avoids 'method slurring' – a challenge commonly associated with adopting the generic approach that can be overcome by applying an a priori theoretical framework.[199]

The development of semi-structured interview guides (Appendices 5.8 and 5.15) were informed by the COM-B model to allow exploration of the key determinants of behaviour around the delivery and receipt of SHS harm reduction messages in primary care settings. The interviews were focussed on participants' capability, opportunity and motivation to better understand current behaviours and explored how behaviour could be changed to incorporate SHS harm reduction intervention delivery and receipt into primary care settings (Figure 5.1). By using this model to inform the guides, the data collected were broadly comparable across the participant groups. Concurrent data collection and initial analysis facilitated the iterative development of the interview guide as appropriate.[203]

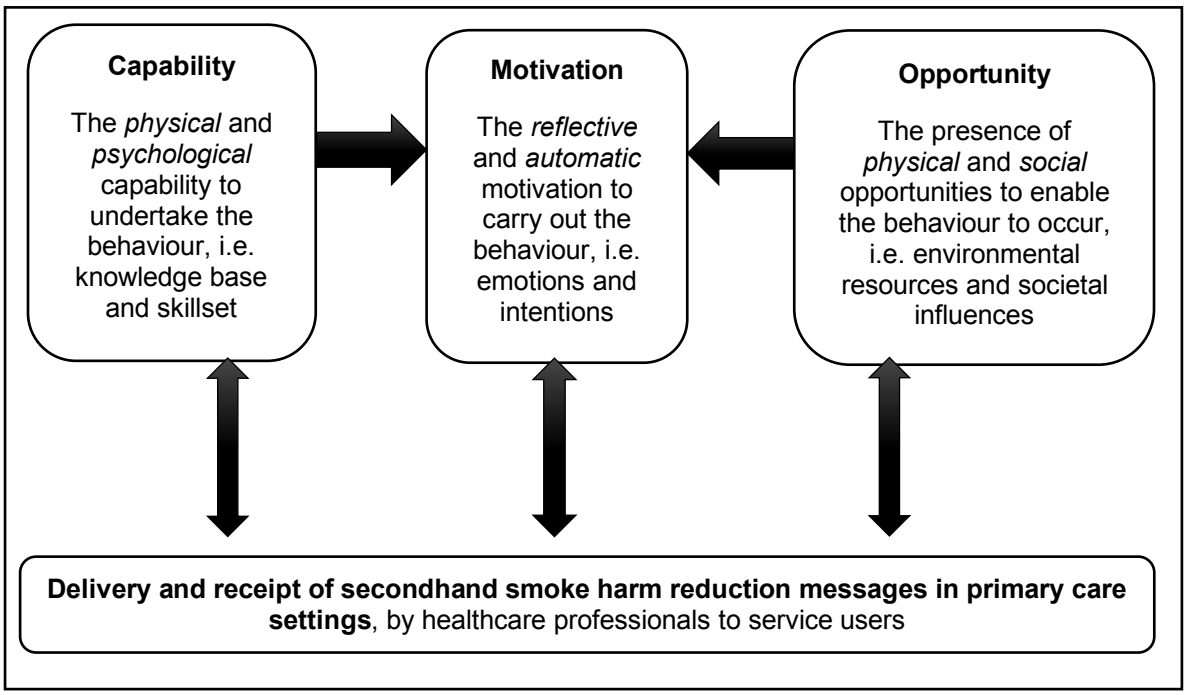


Figure 5.1 Application of the COM-B model to the research aim (adapted from Michie et al.)

Separate interview guides were developed for each of the participant groups to facilitate tailoring of questions. Both guides were designed using a structure complementary to the structure of the quantitative survey tool described in chapter 4. Firstly, participants' current knowledge/ experiences/ exposure was explored to build a picture of current practice. This also worked as an ice-breaker to initiate the interview discussion with participants. This opening section of the interview was developed to address objectives 1 and 2 for HCPs and objective 1 for the service user interviewees. Secondly, the topics of capability, then opportunity, followed by motivation were explored in alignment with objective 3 for HCPs and objective 2 for the service user group. The COM-B Model of behaviour change as described in reference literature[162] was used to develop these points and elicit questions which would allow for the exploration of each of these three topics as described above. The addition of "round off questions" to conclude each interview allowed the researcher to ensure that all aspects of discussion had been explored and understood by the researcher. Furthermore, this section of the guide allowed participants to make recommendations for future intervention practices, thereby addressing objective 3 for the HCP group and objective 4 for the service user interviewees.

The development of each question included in the interview guides relied on reference to wider literature[162]; reference to the list of potential survey questions that was made and used in the development of the DeSSHaRM survey tool; reflection on the earlier systematic review findings and identified areas for further exploration; as well as, discussion with the research team to draw on their experience and recommendations. The interview guides remained flexible and developed iteratively as each interview was conducted, reflected on and as the analysis of the data began to develop as mentioned in section 5.2.8.

5.2.2 Study setting

A variety of recruitment strategies were employed across different settings as detailed in section 5.2.3. The study interviews were conducted primarily in primary care settings, in the homes of smokers, at the University of Birmingham, or over the telephone. Further details are provided in section 5.2.7.

5.2.3 Recruitment methods

In order to maximise recruitment for both groups of participants, a variety of participant identification strategies were employed across multiple sites in the primary care sector across Birmingham. Table 5.1 provides a summary of the recruitment strategies that were used.

Healthcare professional group:

To recruit participants for the HCP group, study information was disseminated to the target population by practice managers, team leaders and professional bodies/ membership societies. Following this, interested potential participants could contact a member of the research team using the provided contact details. These identified eligible participants were also asked to disseminate the study information to any colleagues who may be eligible and interested in study participation.

Service user group:

Posters advertising the study were displayed across all of the identified recruitment sites (Table 5.1). Pharmacies and children's centres were added to the list of recruitment sites following an approved study amendment during the recruitment phase, so as to increase study recruitment (section 5.2.6). Potential participants were approached, in the first

instance, by a member of their usual care team. Brief participant information leaflets (PILs) (Appendices 5.4 and 5.10) were made available at reception desks and in communal waiting areas. The brief PIL contained the contact details of the research team. Receptionists were also given PILs to distribute to potential participants.

Following an approach by a member of the usual care team, participants were recruited to the study face-to-face by myself in the primary care environment (i.e. in a clinic waiting room) so far as was logistically possible. Alternatively, for individuals who saw a study advertisement and subsequently contacted the research team, a member of the team screened the participant for eligibility and discussed study details and interview arrangements, via the telephone. Identified eligible participants were asked to pass on the study details (and were supplied with additional PILs to share with others) to their friends or family who they felt may be eligible and interested in participating in this study.

Table 5.1 Summary of recruitment strategies

Recruitment strategy	**Participant group targeted**
Recruitment by myself in-person and via advertisements by practice managers and team leaders within the NHS primary care sector in Birmingham	Healthcare professionals
Advertising via professional bodies and membership societies	Healthcare professionals
Recruitment by myself in-person and via advertising in GP surgeries	Service users
Recruitment by myself in-person and via advertising in clinics run by teams within the Birmingham Community Healthcare Trust	Service users
Via advertising in children's centres	Service users
Via advertising in pharmacies	Service users
By snowballing from eligible participants	Healthcare professionals and service users

General advertising using electronic communications (e.g. social media of recruitment sites)	Healthcare professionals and service users
Advertising though personal networks	Healthcare professionals

5.2.4 Eligibility

5.2.4.1 Inclusion criteria

Healthcare professional group:

HCPs included in this study were working in primary care settings in Birmingham and the West Midlands (UK) and were consulting with service users who smoked in home environments potentially exposing non-smokers to SHS. All were over 18 and able to provide informed written consent to participation.

Service user group:

Participants included in the service user group were those who accessed UK primary care services and were also tobacco smokers who smoked in home environments where non-smokers were at risk of being exposed to SHS. These participants had to have a good level of spoken English, were able to provide informed written consent and were aged 18 years or over (restricted to coincide with the UK legal restrictions around tobacco smoking). During the recruitment phase of this study, the inclusion criteria were widened (section 5.2.6) to also include service users who were current tobacco smokers and had previously (within the last 10 years) smoked inside home environments, where non-smokers had an increased exposure risk.

5.2.4.2 Exclusion criteria

Healthcare professional group:

No data were collected from undergraduate or pre-registration students of healthcare professions who were working in primary care settings.

Service user group:

This study did not collect data from service users who only used smokeless tobacco or electronic cigarettes in the home. Smoking service users who were pregnant were also excluded from this study as guidance given to HCPs states that they should always be promoting smoking cessation (even if only for the period of pregnancy) in this service user group.[75,204] Therefore, a harm reduction strategy would not be the preferred option in these scenarios, even if the pregnant service user smoked in homes where older children or other householders were at risk of SHSe.

5.2.5 Sampling

It was anticipated that recruiting participants (both of HCPs and of service users) would be difficult.[205] Despite evidence of increased learning, improved patient care and sense of altruism promoting GPs' participation in healthcare research, barriers such as a lack of time and an increasing workload make the recruitment of GPs for research challenging.[206–208] The size of the study sample was ultimately determined by the number of interviews required to reach the point of analytic data saturation.[209–212] Therefore, active recruitment and data collection continued until the research team judged that the data and sample had sufficient depth and breadth to address the research questions.[209–211] An estimate of 30 interviews in the HCP group and 20 interviews in the service user group had been proposed prior to the

start of recruitment. These estimates were derived based on the past experiences of the research team members [213–216] and by taking into consideration the aims and the time restrictions of this study.

Maximum variation purposive sampling[217] was used to sample participants in each of the groups. The variables included in the maximum variation sampling of HCPs included: the type of profession, years of professional experience, and smoking history for HCPs. Meanwhile, the variable of interest in the maximum variation sampling of service users was regarding the age group of the non-smoker who is exposed to SHSe by the smoking interview participant. This sampling technique was chosen to help maximise the diversity in the results collected and thus ensured a better exploration of the topic.[217] The recruitment methods used to achieve this sampling technique has been discussed in section 5.2.3. A discussion reflecting on the attainment of maximum variation purposive samples for both the HCP and service user groups is provided in Chapter 7 (Discussion).

The sampling of groups within the two participant types (HCPs and service users) allowed for exploration of similarities and differences between these participant groups. It also helped to identify how the groups differed in their influence on their suggested recommendations for implementing SHS harm reduction messages in future practices.[217,218] Overall, the chosen sampling technique was selected with the aim of best answering the study aim.

Further details of the groups and characteristics for inclusion in the study sample are outlined herein.

<u>Healthcare professional group:</u>

The HCP groups that were targeted (irrespective of the opportunistic vs. routine nature of service provision), included:

- Medical professional (this could include GP (principal, registrar or in-training), locum doctors in GP surgeries, community paediatricians)
- Nurse (this could include practice-based nurses, community nurses or district nurses)
- Health visitor

These roles were identified following the review of relevant NICE guidelines and their recommendations and review of the A-Z list of services provided by the Birmingham Community Healthcare NHS Foundation Trust.[219] The pharmacist group was subsequently added to the list of target HCP groups to improve study recruitment and in light of their role in the provision of smoking-related advice as referenced during data collection by many of the early interviewees.

In order to increase sample diversity within each HCP group, it was hoped that participants would ideally have a mixture of the following characteristics:

- Years of experience: less than 3 years vs. more than 3 years
- Current smoker vs. ex-smoker or never smoker

These characteristics were selected due to evidence in current literature (see chapter 3, Systematic review) indicating that HCPs' own smoking experiences as well as the length of

their professional experience can influence if and how SHS-related interventions are delivered in practice.

Service user group:

The groups of service users who were targeted aimed to include:

- Parent/ guardian/ carer/ responsible adult of infants and young children (aged 0-5 years)
- Parent/ guardian/ carer/ responsible adult of older children and adolescents (aged 6-17 years)
- Adults living with non-smoking adults (aged 18 years and over)

The ethnicity, age, gender and employment status of each of participant recruited was also recorded to allow for discussion around the transferability of results (see chapter 7, Discussion).

A background questionnaire was used to collect data from all of the interviewees to inform the sampling process.

5.2.6 Changes to inclusion criteria during sample recruitment

As anticipated, recruitment of participants to the study was slow and the maximum variation purposive sample characteristics were not being achieved at the study outset. Therefore, the study inclusion criteria were widened during the recruitment phase and the recruitment phase was extended (with appropriate permissions outlined in section 5.2.11). These

changes have been detailed in the appropriate sections in this chapter. Box 5.1 provides an overview of all of the changes made to the study design during data collection.

Box 5.1 Summary of changes made to study design

- Inclusion criteria was widened to also include service users who were current tobacco smokers and had previously (within the last 10 years) smoked inside home environments, where non-smokers had an increased exposure risk. This change was made to maximise recruitment and better reflect the service user viewpoint given the learning gained during the contemporaneous recruitment and data collection processes.
- Pharmacies and children's centres were added to the list of recruitment sites to maximise recruitment to the study.
- Time length for recruitment was extended to maximise recruitment of participants to the study.
- Study advertisement material could be sent to research leads as well as practice managers and team leaders so as to disseminate the adverts wider for the purpose of increasing recruitment.

5.2.7 Consent processes

Consent (preferably written but sometimes verbal) was sought for the recording of participants' contact details prior to the arrangement of the interview and thus prior to the attainment of consent to participate in the study. Informed consent (either verbal or written) was also sought to allow the storage of contactable details for the purposes of making interview arrangements. Written informed consent to take part in the study was sought from all participants before beginning the interview questions (Appendices 5.6 and 5.13). This process of obtaining consent exceeded the minimum requirements to reduce the risk of harm to research participants.[220] Only participants with consenting capacity were included in this study, i.e. participants were able to understand and retain the presented information in order to make an informed decision and could communicate their decision of whether or not to consent to participate in this research.[221]

The agreement to consent followed the provision of a brief written explanation of the study participant information leaflet (PIL), time to consider their participation, and an opportunity to ask questions about the study either face-to-face, via the telephone or via email communication, as recommended by the World Health Organization in the conduct of qualitative research.[222] Potential participants were given sufficient time to decide whether or not they wanted to take part in this study. It was made explicitly clear that participation in this study was voluntary and would in no way affect their provision of clinical care (service user group). Once completed, a copy of the informed consent form was given to each participant for their own reference.

5.2.8 Data collection

Semi-structured interviews have been suggested as an appropriate data collection method for use in studies with a generic qualitative approach.[200,201] This method is useful when trying to collect open-ended data giving insight to participants' beliefs and experiences on sensitive topics as is potentially the case in this study.[223,224] Interviews would facilitate an opportunity for detailed individual accounts and perspectives[225] regarding the use of primary care services to deliver a potentially sensitive intervention around SHSe.[225] Semi-structured interviews were also logistically easier to arrange at the convenience of each individual participant compared to other data collection methods such as focus groups.[225] Discussion guides (Appendices 5.8 and 5.15) were informed by the COM-B model, the results of the literature review and discussions within the research team. The interview topic guide

remained flexible and was developed iteratively following reflection and debriefing after each data collection event.

The interviews were conducted by myself and took place in a location based on participant preference, or via telephone. The location choices included the participants' homes (for the service user group), place of work (for the HCP group) or in a private room at the Institute of Applied Health Research, University of Birmingham (for either group). Face-to-face interviews were preferred for this study to better build trust between the interviewer and the participant as well as to aid the interview process by keeping the conversation focussed on the interview and by helping to share visual cues for better understanding.[226,227] Face-to-face interviews were believed to collect more honest data, whereas telephone interviews have a higher instance of participants offering socially desirable responses.[228] However, telephone interviews were offered as an alternative when a face-to-face meeting was not possible. Interviews were recorded (appropriately and with each participants' consent (section 5.2.7 and 5.2.8)) to facilitate the collection, transcription and analysis of the data.

5.2.9 Expenses & reimbursement

Participants were reimbursed for their travel expenses to and from the interview venue (only where the interview venue was the University of Birmingham). All participants in the service user group were given a £10 high street voucher at the end of the interview to reimburse them for their time.

5.2.10 Data analysis

Each interview was digitally audio recorded and transcribed verbatim by myself and a professional transcription service transcriber (in compliance with processes covered in

section 5.2.11). NVivo software (versions 9, 10 and 11) was used to help manage the data set and aid the construction of codes and themes during the analysis phase.

The original thematic analysis method as described by Braun and Clarke in 2006[229] was used to analyse this qualitative data. This approach is suitable for applied health research studies and could be used by an inexperienced researcher under the guidance of an experienced qualitative methodologist.[229] This method of data analysis is useful to help answer research questions that aim to describe a phenomenon by using patterns encoded within the data.[229,230] Additionally, thematic analysis is a well suited and recommended method to analyse data collected in studies designed with a generic qualitative approach.[200]

Box 5.2 Steps used in data analysis process

Steps involved during data analysis:

1. Reflections on data and data collection.
2. Familiarisation of data during the transcribing process. Read the transcripts and created summary memos on each interview.
3. Deductively coded the data to Capability, Opportunity, Motivation, and/or Intervention using NVivo.
4. Inductively coded within each of the deductive major themes (Capability, Opportunity, Motivation and Intervention) using NVivo.
    a) Coded a selection of transcripts to develop a working analytical codebook (based on the 10 "richest" transcripts)
    b) Discussed this selection of coding and the developed draft codebook with LJ and agreed changes
5. Continued to inductively code the remainder of the data set, refining the codebook as an ongoing process and then reapplying and redefining again. Reviewed the themes being interpreted in the process.
6. Developed a finalised codebook which was then applied across all of the transcripts in NVivo.
7. Each of the themes and sub-themes were defined.
8. Inductive themes and sub-themes were interpreted within each of the deductive major themes, thereby improving rigour as well as offering a synthesis of the data.
9. Synthesis of the data was written as a report with a deductive-inductive hybrid approach to echo the method used.

A hybrid deductive-inductive approach was adopted to suit the structure of the data and the incorporation of the COM-B Model into the analysis phase as detailed in Box 5.2. As both interview guides were informed by the COM-B model, the topics discussed in the interviews were similar and could therefore be used to compare and contrast findings across the participant groups.[231] Any complementary or contrasting views between participant groups have been reported in the study results (section 5.3) and quotes from participants have been to illustrate study findings. The COM-B model also provided a structure for the interpretation and presentation of the study results (section 5.3). Based on the research objectives and this guiding model of behaviour change, the pre-defined deductive major

themes were: Capability, Opportunity, Motivation and, Intervention. As an initial step in the analysis, these four themes were applied deductively to the dataset (both HCP and service user data). The six steps of Braun and Clarke's method of thematic analysis were then applied inductively within each of these themes generating interpreted sub-themes. The study results (section 5.3) are presented in this chapter to follow this structure (i.e. discussion of the inductive themes and sub-themes within each of these deductive major themes). At the end of the synthesis, it was apparent that there was much overlap between the inductive themes and sub-themes which linked the deductive groups together as illustrated in Figure 5.3 (results section 5.3). Figure 5.2 exemplifies the development of inductive themes and subthemes.

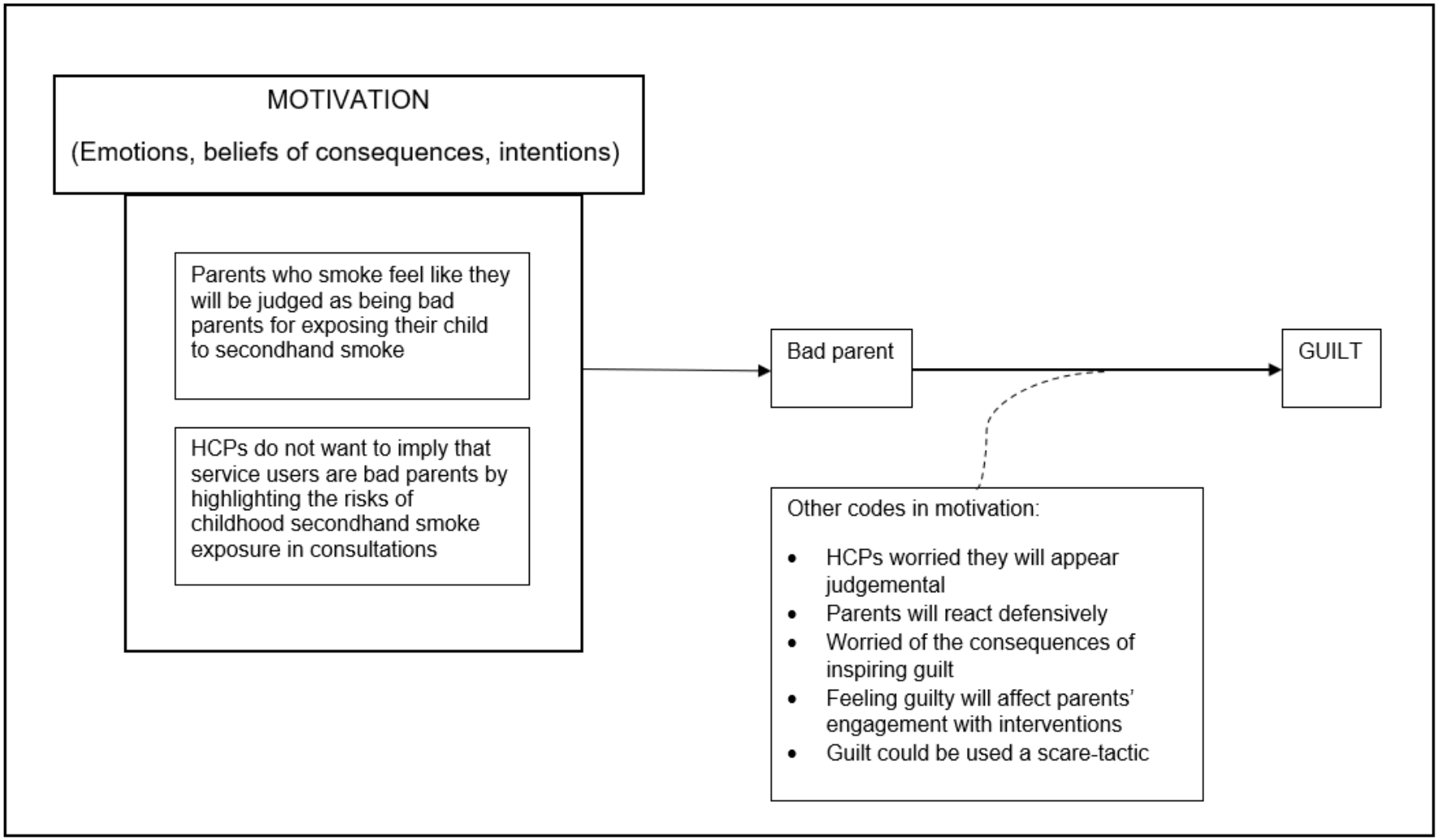


Figure 5.2 An illustrative example of code, category and sub-theme development

5.2.11 Ethics and regulatory compliance

5.2.11.1 Confidentiality

Each participant was assigned a unique study ID number and personal identifiable data were removed from transcripts as part of the quality checking. Any direct quotations used have and will remain anonymised and only identified via the unique study ID number. The secure access, storage and disposal of data (section 5.2.11.2) ensured the participants' confidentiality has been maintained throughout the study.

5.2.11.2 Storage, access and disposal of data

All members of the research team had up to date Good Clinical Practice (GCP) training and were compliant with the core principles outlined by the Data Protection Act 1998, including those relating to the collection, storage, access, and disposal of data. In addition to this, the University of Birmingham's data protection policies and procedures were upheld by all members of the research team. Identifiable data (e.g. name, postcode, date of birth, audio files, consent forms) is being securely stored until 12 months after the publication of study findings or award of PhD (whichever is the latter) and will then be appropriately destroyed in accordance with University of Birmingham policy. Anonymised data, in accordance with the policy set out by the University of Birmingham, will be securely stored for 10 years following the publication of the main study results/award of the PhD whichever is the latter. All data will be archived in accordance with the University of Birmingham (UoB) archiving standard operating procedure; QMS reference number: UoB-CLN-ARC-SOP-001. Data will be stored at a UoB approved external archiving facility.

With each participant's consent, an encrypted digital voice recorder was used to record each interview. The encrypted audio files were transcribed by myself and a specialist external company. The transcribing company signed a confidentiality and data storage agreement prior to commencing transcription work. The audio files were transferred to the external company via a secure server using user identifiers and passwords. Following receipt of the transcripts from the transcription company, each transcript was stripped of any identifiable references made during the discussion such as names and places. The audio recordings have been stored and managed in the same way as personal data as they are considered as identifiable data.

All data collected as part of the study were held securely in a locked room or in locked drawers at the University of Birmingham. Access to the information was limited to the study staff, investigators and relevant regulatory authorities. Computer held data, including the study database, were held securely on encrypted machines which were password protected. An encrypted laptop was also used for the study and the data remained stored on the University server. When in use, any paper datasets or the audio recorder were kept on my person at all times and were put into secure storage at the University of Birmingham at the earliest opportunity.

5.2.11.3 Study approval

Before commencing this study, approval was sought from the NHS Health Research Authority and an NHS Research Ethics Committee (REC) for the study protocol, informed consent forms and other relevant documents e.g. advertisements. The study was reviewed and received a favourable opinion by the North East-York REC (Appendices 5.1 and 5.2).

Appropriate approvals were also sought from local Research and Development departments before the data collection commenced.

5.3 Results

5.3.1 Summary of demographics

Interviews were conducted with 25 HCPs and 9 service users (ranging in time length between ~30mins and ~90mins). Tables 5.2 and 5.3 outline the key characteristics of this sample, respectively.

Table 5.2 Characteristics of healthcare professionals who were interviewed for this study

Participant number	Health Care Professional type	Length of employment in primary care	Smoking status
1	General Practitioner	4-10 years	Never smoked
2	General Practitioner	4-10 years	Never smoked
3	General Practitioner	Not disclosed	Not disclosed
4	General Practitioner	4-10 years	Never smoked
5	General Practitioner	4-10 years	Never smoked
6	General Practitioner	More than 10 years	Never smoked
7	General Practitioner	1-3 years	Never smoked
8	General Practitioner	1-3 years	Never smoked
9	General Practitioner	1-3 years	Never smoked
10	General Practitioner	1-3 years	Never smoked
11	Pharmacist	1-3 years	Never smoked
12	Pharmacist	4-10 years	Never smoked
13	Pharmacist	4-10 years	Never smoked
14	Pharmacist	1-3 years	Never smoked
15	Pharmacist	1-3 years	Never smoked
16	Pharmacist	1-3 years	Never smoked
17	Pharmacist	4-10 years	Never smoked
18	Pharmacist	More than 10 years	Never smoked
19	Pharmacist	4-10 years	Never smoked
20	Nurse	4-10 years	Never smoked
21	Nurse	More than 10 years	Never smoked
22	Nurse	4-10 years	Ex-smoker
23	Health Visitor	More than 10 years	Never smoked
24	Health Visitor	4-10 years	Never smoked
25	Health Care Assistant	1-3 years	Ex-smoker

Table 5.3 Characteristics of service users who smoked that were interviewed for this study

Participant number	Age (years)	Relationship with non-smokers in home	How many cigarettes smoked per day	Which primary care service providers have you seen in the last year?
26	27	Mother, Spouse and Daughter	1-10	Health Visitor; HCA
27	45	Mother	11-20	GP; Nurse; Dentist; Health visitor; Pharmacist
28	75	Other – not disclosed	Not disclosed	GP; Nurse; Pharmacist
29	26	Mother and partner	11-20	Health Visitor; HCA; Pharmacist; Family Support Worker
30	30	Other – family member	11-20	Nurse
31	23	Other – not disclosed	11-20	GP; Nurse; Pharmacist
32	27	Father and Spouse	11-20	GP; Nurse; Health visitor
33	32	Father, Spouse, Son and Other – not disclosed	1-10	Not disclosed
34	35	Father, partner and friend	21+	GP

GP: General Practitioner; HCA: Healthcare Assistant

5.3.2 Summary of findings

The data are presented under the deductively applied major themes of Capability, Opportunity, Motivation and Intervention. The inductive themes and sub-themes shape the narrative flow within each of these deductive major themes, as outlined in Table 5.4. As described below, there was much interaction between the themes and sub-themes which are broadly outlined in Figure 5.3 and exemplified in Box 5.3. Appendix 5.16 offers a more in-depth overview of the overlap of inductive themes across the four major themes (Capability, Opportunity, Motivation, and Intervention).

Table 5.4 Inductive themes and sub-themes interpreted within each of the deductively applied Capability, Opportunity, Motivation and, Intervention deductive major themes

Deductive major themes	**Inductive interpreted themes**	**Inductive interpreted sub-themes**
Capability	Perception of HCP roles and responsibilities	Discussed from the perspectives of GPs, pharmacists, nurses, HCAs, health visitors and service users
	Knowledge of topic of SHS	Understanding of SHS
		Who's at risk of SHSe and how to identify them?
		Consequences of SHSe
		SHSe as a sensitive topic
	Knowledge of topic of SHS harm reduction	Understanding of SHS harm reduction
		Awareness of and existing strategies to reduce SHSe in the home
		E-cigarettes or vapes
	Acquisition of knowledge about SHS	Source of knowledge and training/ education around SHSe
		Laws and campaigns
Opportunity	Access to services supporting SHSe harm reduction	
	Lack of supportive resources (i.e. time and funding)	
	Role and appointment type providing opportunity to intervene	
		Incentivisation by others to encourage SHSe intervention delivery from HCPs

	How opportunity is affected by HCPs' social environments	Effect of others' views around the professional expectations for HCPs
		Effect of third party
Motivation	Guilt	
	Patient-professional relationship	
	Beliefs about efficacy	
	Appropriateness	Perception of service user receptivity to intervention
		Perception of job role
		Are SHSe interventions needed?
Intervention	Desired goal(s) from a SHSe-related intervention	
	Delivered by whom	
	Delivered to which groups of service users	Universal approach
		Medically relevant consultations
		Parents
		Smoking service users only
	Recommended timing for intervention	Recommendations of the intervention intensity
		Recommended time points to intervene
		Time length of a single intervention
	What should a SHSe intervention include?	Recommendations for what the intervention should involve

		Supportive measures for implementation
		Points that HCPs would like to learn in order to deliver an intervention
		Points that service users want to learn from an intervention

HCP: healthcare professional; GP: general practitioner; HCA: healthcare assistant; SHS: secondhand smoke; SHSe: secondhand smoke exposure

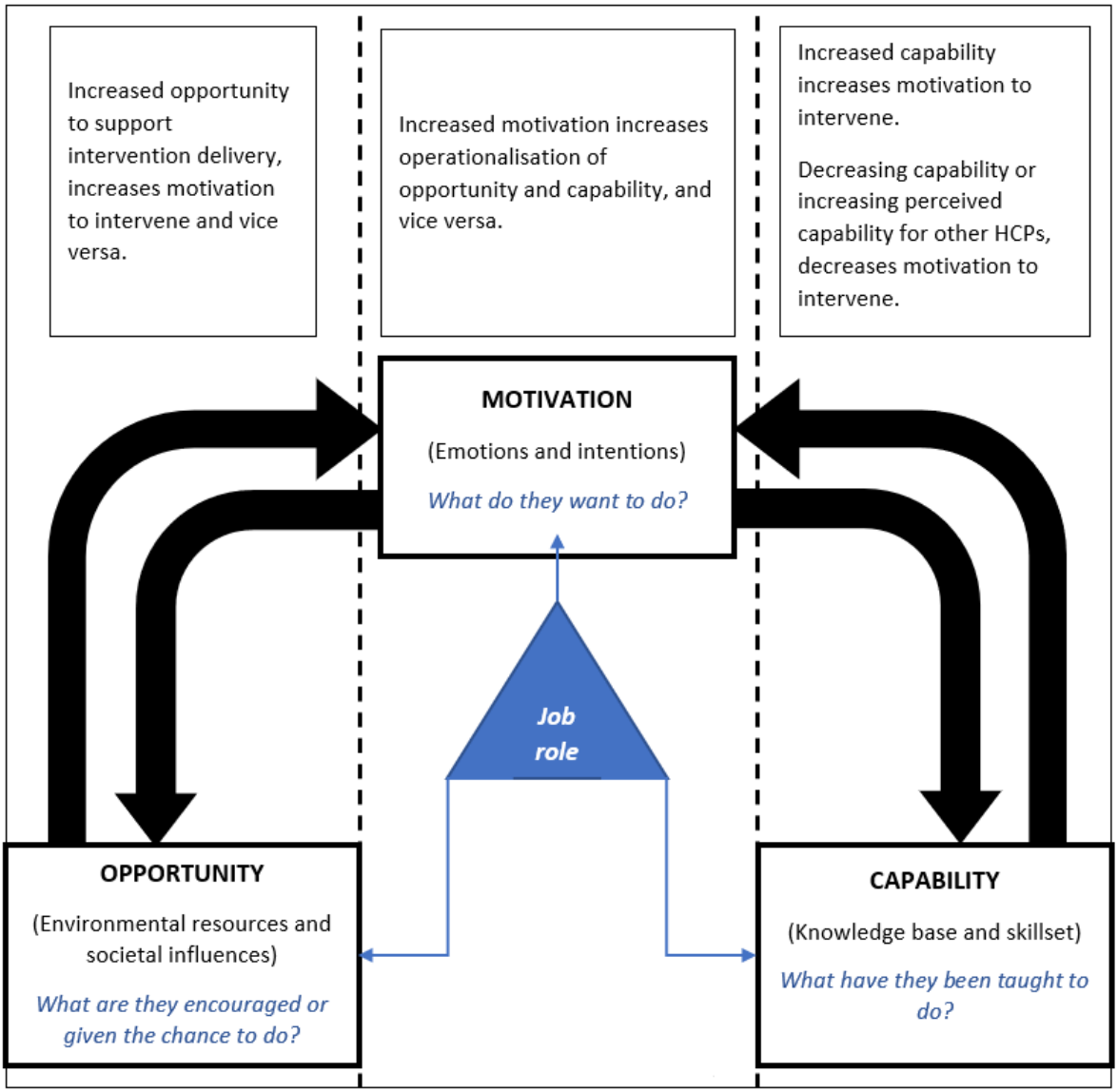


Figure 5.3 Exemplar illustration of the interplay of the COM themes

Box 5.3 Examples of possible interactions between COM components

Example 1:

Lack of awareness of SHS harm reduction means low capability to intervene, which undermines motivation to intervene. Thus, the HCP is less likely to take presented opportunities to intervene in practice.

Example 2:

Lack of time to intervene demotivates the HCP to offer the intervention, which makes them less motivated to complete training that could have improved their capability to deliver an intervention around SHSe.

5.3.3 Capability

There were four main themes which were interpreted from the data regarding primary care-based HCPs' capability to deliver an intervention supporting SHS harm reduction: perceptions of HCPs' roles and affiliated responsibilities; HCPs' knowledge of the topic of SHS; HCPs' knowledge on the topic of SHS harm reduction; and acquisition of knowledge. Service users' views on these themes have also been presented, where available, to give insight into the perceptions of HCPs' capability to deliver SHS interventions in primary care settings.

5.3.3.1 Perceptions of HCP roles and responsibilities

Healthcare Professionals

Most HCPs felt that all members of the primary care team had a responsibility to tackle the issue of SHSe. HCPs felt that their role, their level of training, and the skillset they acquired as part of role development gave them the capability to intervene around SHSe. Many referred to "Every Contact Counts"[72] and considered it was part of their job role to conduct health promotion activities, such as the delivery of SHSe interventions. The extent to which particular HCPs should be involved in interventions is further explored in the intervention section of the results (5.3.6). All HCP groups felt they had capability to signpost (to appropriate resources or services) with additional interventions being suggested as suited for some HCP roles. For example, it was suggested that practice nurses could follow up on a discussion about harm reduction and set objectives with a service user wanting to change their home smoking behaviours to reduce SHSe. These nuances were interpreted when

capability was linked with opportunity of access to the target demographic or time as resource.

> *"I think everyone has got a signposting role" (p3, GP)*
>
> *"No, I think in the same way as everything else it's important that everybody is aware of it [SHS] and is prompting questioning on it...I think it's the role of the MDT [multidisciplinary team], and there's lots of evidence to say the more something is brought up the more this idea of nudging, so the more nudges a patient gets the more likely they are to change their action." (p9, GP)*

General Practitioners (GPs): GPs felt their training and their experience of delivering smoking cessation interventions; alongside their role in distributing informative leaflets and referring service users to specialist support provided them the capability to intervene around SHSe.

> *"In terms of identifying it [SHSe] and suggesting that something needed doing about it? I think GPs definitely, I think yeah because it is important to our diagnosis but we're also looking at risk factors and sign posting patients to things that need addressing that they might not necessarily realise is a problem." (p2, GP)*

Some HCPs made reference to the perception that service users may be more responsive to GPs, thereby giving GPs a higher level of capability to deliver an intervention on SHSe than other HCP groups. Thus, capability can be contingent on motivational factors, i.e. relationship between service users and providers for different job roles; regarding GPs, *"they are more reverential with the GP, and also they will I don't know if they're scared of them" (p16, pharmacist)* so they may have higher capability than other HCP groups to intervene around SHSe.

Pharmacists: Pharmacists felt that their training and role in providing 'Medicine Use Review' (MUR) and 'New Medicine Service' (NMS) services, in addition to their position in the community, gave them the physical and psychological capability to intervene around SHSe, in addition to creating consultation opportunities to deliver interventions (as discussed in the opportunity section, 5.3.4).

Nurses: GPs reported that nurses were more likely to have longer and more frequent consultations with the service users who were at risk of SHSe and/or those service users who put others at risk of SHSe. These GPs believed that nurses would, therefore, receive training for these consultations, which would increase nurses' capability to intervene.

> *"Because actually it is the practice nurses who do a lot of the chronic disease management" (p1, GP)*

Nurses' views corroborated this perception. However, in one divergent case a nurse felt that interventions to support the reduction of SHSe did not align with the assessments she was responsible for conducting in her job role, indicating her reduced capability (and reduced motivation) to intervene due to her perception of her job role.

> *"Yeah stop smoking services and things like that, maybe just mention it but we wouldn't do the referral or anything like that; basically, my assessment is just gathering information for the purpose of my assessment." (p20, Nurse)*

Healthcare Assistants (HCAs): Some GPs made reference to the role of HCAs in the primary care setting, explaining that HCAs, as well as nurses, may have more current relevant knowledge and therefore, may have better capability to intervene around SHSe.

> *"Obviously within say, our surgery for example, we've got a few of our healthcare assistants who help patients with the smoking cessation in terms of their quitting and nicotine replacement and things like that, so they may have probably a bit more of an up to date knowledge base, so they may probably provide a better harm reduction and quitting advice than probably I can." (p10, GP)*

Health visitors (HVs): HVs felt that their job role encompassed activities which gave them the capability to intervene around SHSe. For example, they conduct mandatory consultations during which they ask mother's about smoking and their partner/family's smoking habits. Some reported being trained in motivational interviewing for their job role and believed this furthered their capability to intervene on SHSe as these transferable skills were considered useful for sensitive discussions concerning behaviours such as smoking in the home environment. HVs also felt the topic of SHSe came up naturally in conversation because of their focus on the health and wellbeing of the baby in the home environment. It should be noted, however, that these findings represent the views of only two HVs who were interviewed as part of this research study. Further interviews with health visitors are needed to follow up these findings with a larger sample of HVs in the future for further exploration of these views.

Service users

Most smoking service users perceived that any HCP member of the primary care team would have the capability to offer interventions supporting SHSe behaviour change. Although the discrepancies between the expectation and their experiences indicated that service users might perceive HCPs to have more capability to deliver interventions around SHSe than they

actually do in reality. Note, they spoke prospectively of HCPs' capability to deliver SHSe interventions.

> *"I think they could be a lot more helpful and give you other options, but I don't think in the past when I've been they have been literally give me the basic information I needed and that's it." (p30, service user)*

> *"I suppose if there was a specific type of person, whether it's a nurse or a GP that is the smoking person then they would probably know a lot more than just the receptionist or just a practice nurse or anyone, but they should all know quite a bit to do with this whole area." (p31, service user)*

However, one service user felt a more senior member of the team would have better capability to deliver an intervention.

> *"I think it would have to be…it must be a higher member of staff, like say a manager or a manageress or something like that, not just an everyday one." (p28, service user)*

Another service user felt that her GP did not have the capability to intervene on SHSe, although in her opinion a community pharmacist might. This seemed to be based on availability and access to nicotine replacement therapy from pharmacies in comparison to the instruction to quit smoking from the GP.

> *"I go to the chemist for different things and they try to give you advice and they are good…GPs are not the way forward." (p26, service user)*

5.3.3.2 Knowledge on the topic of SHS

<u>Understanding of SHS:</u>

The majority of HCPs attempted to provide a definition of SHSe, often referring to the term 'passive smoking' in their explanations.

"It's like passive smoking. So, you're not directly smoking yourself so it's smoke from someone else smoking in close distance to yourself" (p20, nurse)

Despite demonstrating a broad awareness of SHSe, most HCPs did not feel confident in their level of knowledge of the topic; lowering their self-perceived capability to intervene around SHSe. When asked about their knowledge around SHS, most interviewees responded something similar to:

"Not a huge amount I would say, embarrassingly!" (p1, GP)

Moreover, there was some confusion around the distinction between secondhand and thirdhand smoke. Many of the HCPs included thirdhand smoke in their definition of SHS. This confusion could affect the advice given by a HCP to help reduce SHSe and thus, is likely to affect HCPs' capability to intervene in this area.

"That's what you try to say is that, well, cigarette smoke sticks to everything, your hair, your clothes, and you're taking it back into your house." (p25, HCA)

<u>Who is at risk of SHSe and how to identify them:</u>

HCPs identified that non-smokers at risk of SHSe were likely to be those living in a house with a smoker. Thus, they named the children and non-smoking partners of smokers to be the main 'at-risk' groups for SHSe.

"So, children being exposed to smoke from parents, or a partner who doesn't smoke being exposed to smoke from the partner who does smoke" (p16, pharmacist)

GPs and Nurses felt that SHSe would most likely be identified when a service user presented with a related illness (see consequences sub-theme in 5.3.3.2). Furthermore, HCPs' understanding of the associated health risks increased their capability to identify intervention opportunities based on the risk they identify. Alternatively, non-smoking service users might directly ask their HCP if they were worried about the health effects of SHSe.

> *"Say a patient is nervous about lung cancer and maybe his wife used to smoke heavily" (p3, GP)*

Consequences of SHSe:

All of the HCPs interviewed were aware that SHSe was associated with health risks. The majority identified "respiratory complaints" as the main health consequence of SHSe. Exposed adult non-smokers were correctly thought to be at risk of lung cancers, chronic obstructive pulmonary disease (COPD), chest infections, chronic cough and cardiovascular disease. Exposed children were understood to be at risk of asthma diagnoses and exacerbations, wheeze, recurrent viral infections, sniffles and smaller birth weights.

> *"You've got an adult who has come in maybe with chest symptoms or a chest infection […] a child comes in with either known asthma or new asthma or an asthma flare up" (p7, GP)*

There was a general understanding that children were at a greater risk of developing detrimental health consequences following SHSe. Elderly service users and those with co-morbidities were also considered higher risk groups for experiencing health risks of SHSe.

> *"I am not really a fan of smoking, but especially around children- they are a bit more susceptible to it impacting on their health because their immune systems are still developing." (p15, pharmacist)*

> *"It's maybe a cumulative effect of long term [SHS] exposure that would be dangerous, and things where it would be of more concern is if you are young, elderly, if you've got other comorbidities. So I don't know, say if you're asthmatic or if you've got really frail young children say maybe if they're premature children or if you're very elderly." (p16, pharmacist)*

Only two HCPs (p14, pharmacist and p19, pharmacist) were unable to identify any specific health effects though they still showed an awareness of detrimental health effects associated with SHSe. Overall, this awareness of the health risks associated with SHSe for non-smokers was indicative of a having some capability to intervene, i.e. the data indicated that better knowledge led to increased capability to intervene around SHSe.

<u>SHSe as a sensitive topic:</u>

Many felt that SHSe was a sensitive topic to raise in primary care consultations. Therefore, HCPs felt that an appropriate level of skill in raising and conducting the conversation on SHSe was required. Some HCPs therefore felt that they needed further training to give them the capability to discuss the topic of SHSe with service users. The sensitivity surrounding SHSe was also discussed in the 'motivation' section (section 5.3.5).

> *"Yeah I think so, it's similar to other sensitive topics like obesity and things […] also how to sensitively explain that the smoke is going to have effect in the household or children, and then like I say training them on what to say as a plan B harm reduction message. […] a bit of practice in the actual consultation, the words that you use and the phrases that you use to ask potentially sensitive… because it may potentially be a sensitive topic as well. We don't know why the patient is smoking or don't want to stop smoking, you haven't explored that, there could be lots of other things going on." (p7, GP)*

Only one HCP interviewee (p12, pharmacist) actively stated that their capability was not affected by the sensitive nature of SHSe. This divergent HCP explained their view that SHSe was a lifestyle factor which could be easily discussed by HCPs in primary care, as opposed to a *"psychological issue"* which would need to be addressed by a specialist or psychiatrist.

5.3.3.3 Knowledge on the topic of SHS harm reduction

Understanding of SHS harm reduction:

Most interviewees were not aware of the concept of SHS harm reduction prior to their participation in this study. Despite a lack of exposure to this terminology, many HCPs drew on their knowledge base to assume broadly correct definitions of SHS harm reduction. Furthermore, they often showed appreciation for the need to deliver harm reduction messages in instances where a smoking service user was not ready or able to quit.

> *"So, harm reduction, so you mean not getting people to stop, but getting people to reduce harm, so I suppose it's things like making sure they smoke outside, wearing an overcoat and not inside, not in an enclosed space like in a car." (p5, GP)*

> *"I would say messages about please don't smoke in the house, please don't smoke if there's an oxygen cylinder about, please don't smoke if there's other vulnerable patients or people around you." (p16, pharmacist)*

However, HCPs still expressed a desire for further information to be provided to give them better knowledge of the subject and understanding of what SHSe harm reduction messages would entail; thereby improving their capability to intervene around SHSe in the future.

> *"More what to say, because I think when you asked me what would you say I was thinking smoke outside, maybe five or ten minutes, but didn't really know much more than that as to how we can reduce second-hand smoke, and there are probably other things I have not thought of." (p3, GP)*

Awareness of existing strategies and their implementation to reduce SHSe at home:

Healthcare professionals

HCPs understood the complexity surrounding SHSe interventions, explaining:

> *"It's a bit difficult because it's more to do with passive smoking and the environment isn't it? It depends, if they live with someone who smokes maybe they can set rules in the house saying if they smoke outside, don't smoke indoors, or don't smoke around children, stuff like that." (p13, pharmacist)*

Some suggested that harm reduction approaches for both children and adults needed to account for the factors which influence exposure scenarios. For example, it was considered harder in cases of non-smoking adults as they were unsure of who they should deliver an intervention to.

> *"It wouldn't necessarily be the same intervention that you delivered, and it would take I think more thought, because in the context of a child being exposed to secondhand smoke it's very clear who is going to be instigating change, and who the intervention needs to be focused at. I think in terms of harm reduction for an adult being exposed to secondhand smoke it's more tricky to know where you're targeting the intervention, and it's going to depend so much on different factors." (p5, GP)*

There was also confusion amongst the group of HCPs regarding advice which could be given in response to identified SHSe and how this would differ from smoking cessation advice. Most HCPs suggested smoking cessation referral or support as the harm reduction method to reduce SHSe.

> *"To be honest with you, the information on passive smoking, how would it be different on the information on what smoking does to you?" (p15, pharmacist)*

Smoking outside and away from children were the only actions advised by many HCPs when prompted for recommendations.

> *"So, if they're saying they want to continue smoking so I tend to suggest firstly smoking outside and not inside the house, not inside the car, not inside any closed environment. I recommend staying away from the child or away from the house for at least 30 minutes after they have had a cigarette, so tend to use that as advice. So, tend to say stay outside for a prolonged period or change your clothes, if you're wearing a jumper take your jumper off, things like that, so simple measures is a way of doing it. I always encourage somebody to reduce what they are smoking as well, so basics, so even if they say they can't give it up." (p9, GP)*
>
> *"They might just have to change the way that they are going to be smoking really, so if they're at home just go outside" (p18, pharmacist)*

The majority of the HCP interviewees required prompting or scenario discussion to prompt their consideration of a course of action and recommendations in the instance where a smoker was unsuccessful in their cessation attempts but wished to protect their child from SHSe. Such prompting allowed the concept of smoking cessation to be distinguished from the SHS harm reduction situation. For example,

" [Interviewer] My next question is, if you had a scenario where somebody came for an MUR and they were a smoker, and it came out in conversation that they are smoking at home, they might have children in the house but they are not ready to give up smoking, what do you think you might say to that person if they are not ready to give up smoking?" (p14, pharmacist)

Following this prompting, four recommendations were made across all 25 of the HCP interviewees: smoking outside and away from children, smoking in a different room, using a

different nicotine product or wearing a smoking jacket. However, some of the HCPs maintained that cessation was the best strategy for SHSe harm reduction and they were reluctant to make any further recommendations.

A few HCPs included smoking in a different room in the house in their recommendations to reduce SHSe, or using *"less tarry cigarettes or e-cigarettes"* as alternative methods (p1, GP). The aforementioned lack of distinction between second- and thirdhand smoke resulted in many HCPs also promoting the use of a smoking jacket to protect from harms caused by smoke particles settling in smokers' clothes and then transferring to non-smokers. This also highlighted a lack of understanding concerning the risk of SHSe for non-smokers.

> *"Smoking jacket and going out to a different room or preferably going outside, preferably not at all obviously" (p8, GP)*

Some HCPs believed that children's SHSe could be used as an emotive driver to increase the likelihood of getting the service user to engage with harm reduction interventions and to change their smoking behaviours.

> *"We often talk about what impact that smoking is having on them more so than other people […] probably caveat to that is parent child thing because there's probably a bit more of a stronger bond with that relationship, so you can perhaps hone in about the fact that it might affect the child's development or breathing problems as they get older. So that you might be able to push a bit harder" (p10, GP)*

Furthermore, many HCPs referred to offering information to smoking service users about SHSe to help instigate changes in mindsets and encourage future cessation. Thus, they understood offering leaflets with more information was an intervention option.

> *"So, it's just giving them something to read that maybe plants that seed that they need to change their behaviour" (p10, GP)*

The overall lack of confidence in approaches to intervene around SHSe is potentially indicative of low capability to deliver SHSe interventions in practice. Most discussions regarding advice for suggestions were hypothetical in nature, suggesting that in reality there is a lack of capability interventions in practice.

Service users

Service users reported being optimistic that HCPs' had a sufficient level of capability to know what to recommend and to be able to deliver an intervention on SHSe.

> *"It could happen yes, I think so, it could happen, whether it will ever but it could happen yes." (p28, service user)*

<u>E-cigarettes and vaping:</u>

Healthcare Professionals

There was little mention of e-cigarettes and vaping by the HCPs with only four participants making reference. These interviewees were unsure and somewhat sceptical demonstrating a lack of capability to incorporate advice on e-cigarettes and vaping as potential options for SHS harm reduction.

> *"Electronic cigarettes are supposedly better, although when I see the plumes of smoke that come out of them, I don't want to inhale them […] A lot of these new things, if you don't know it, they might be causing a bigger problem." (p2, GP)*

Service Users

Similarly, there was little mention of e-cigarettes and vaping options by service users. Some service users felt smoking cessation advisors' knowledge and recommendations were outdated and needed to include information on e-cigarettes to better tailor advice to younger audiences.

> *"Yeah, so I think there's one stop smoking or one campaign on the TV that mentions vaping and because it's up to date and it's what everyone doing now it catches your eye more. When you see a stop smoking advert its sort of like the same old stuff so that's I think if you're bringing the more update modern kind of things on the material you're more chance of people, younger people if you like well not just younger people but more chance of younger people looking at it than the older stuff" (p32, service user)*

5.3.3.4 Acquisition of knowledge about SHS

Source of knowledge and training/ education around SHSe:

Most of the HCPs interviewed, notably all GPs and all pharmacists, described having received no formal training or education around SHSe. This highlights a potential barrier to HCPs' capability to intervene around SHSe in practice if they have not learned how and what to practice as part of an intervention. These HCPs described gleaning their current knowledge base from general sources including school education and national campaigns advertised on television.

> *"None! Never, that's a really short one. I haven't had any training on, I mean no, none, none." (p1, GP)*
>
> *"It's knowledge that you build up by yourself through your lifelong learning*" (p24, HV)

Most GPs reported that despite completing training on motivational interviewing, more training would be beneficial to support their skill development and consequently, improve their capability to intervene around SHSe.

> *"I think motivational interviewing is one of those things that you can do training on forever and still want more training." (p9, GP)*

Those GPs who had gained knowledge around SHSe during their rotational training in acute paediatric settings (p2 and p5) acquired knowledge and skills applicable to child SHSe interventions during this time. This, however, highlights a gap in training even for these HCPs due to lack of training around adult SHSe interventions.

> *"So yes, in terms of second-hand smoking to children, I would feel confident to discuss it, because I've done lots of paediatrics and we had specific training on secondhand smoking when I did the paediatric rotation" (p5, GP)*

Many of the GPs and pharmacists recalled having received some smoking cessation training during their undergraduate education. However, there was little certainty around whether SHSe was also mentioned as part of this training.

> *"I think they have been training in smoking cessation and smoking as well, and then within that they will talk about secondhand smoking I am pretty sure." (p10, GP)*

In contrast, health visitors reported some discussion of SHSe during training sessions.

> *"I think with the passive smoking we've touched upon on that regarding antenatally and with the relation to cot death, but that's all we had on that, and like I said with the passive smoking it's you don't exactly get training on it, it's just the thing that's touched upon and then you go and explore it further." (p24, HV)*

HCPs mainly referred to their own sources of training and education. No interviewee made reference to where other HCP groups might get their training, despite sometimes stating that others were likely to be better trained and therefore better placed to intervene around SHSe.

Laws and campaigns:

All HCPs demonstrated some knowledge on the laws and campaigns relevant to SHSe. Many referenced the 2007 ban on smoking in public places in England and some referred to the more recent 2015 ban on smoking in cars carrying children. Many HCPs also made reference to the media campaigns which highlighted the reality of SHSe to a broad audience.

> *"I think there are public health messages around secondhand smoke, we know that it is an offence to smoke in a car with children and workplaces, smoking is banned in public spaces because of secondhand smoke" (p4, GP)*

5.3.4 Opportunity

Four themes were interpreted within the data regarding HCPs' opportunities to intervene around SHSe in primary care settings. Of these, three related to the physical opportunities presented to HCPs: access to support services, lack of supportive resources, and the nature of job roles and consultations. The fourth theme encompassed the social environment influence on HCPs opportunity to deliver an intervention. The influencers of social environments captured in this fourth theme revolved around: the incentivisation by others to encourage intervention delivery; the expectations upon each professional group; and the effect of a third party in SHSe-related scenarios.

5.3.4.1 Access to services supporting SHSe harm reduction

Many HCPs would refer service users for smoking cessation support in order to address the issue of SHSe where these were available. In additional this, some HCPs who felt that other HCPs might be better suited in their capability and/or opportunity to offer support around SHSe would, in the first instance, refer service users to other members of their primary care team.

> *"Sometimes I will direct them to what sort of healthcare professional who can help them" (p20, nurse)*

However, as detailed below in the resources section (5.3.4.2), access to these supporting services was reported as being reduced. Thus, there were fewer opportunities for further support to aid cessation with a view to reducing SHSe, thereby undermining HCPs' opportunity to intervene.

5.3.4.2 Lack of supportive resources

HCPs described the pressures on time and funding which reduced their opportunity to intervene on SHSe. Competing priorities of other medical and social problems, the service user's agenda of problems for a consultation, and the lack of supportive resources and funding to offer support all factored into their perceived lack of opportunity.

> *"I guess the time pressure is the biggest thing. Yeah because there's lots of competing lifestyle advice to give, boxes to tick in terms of QOF and things like that, expectations because if they expect to talk about something for twenty minutes (laugh) their condition for twenty minutes and you want to talk about secondhand smoke for five minutes that's not going to work is it." (p2, GP)*

Opportunity to intervene might be inhibited in cases of higher priorities to be addressed (motivation) or a lack of time or other resources. For example, even for a HCP who would intervene on most occasions, time pressures and higher priority concerns would take precedence over intervening to support SHS harm reduction.

> *"Unless it's very rushed and something serious going on, like send them to hospital in an ambulance or something then I might not. But, actually, I think these days every single time I would say." (p3, GP)*

Furthermore, a perceived lack of capability and lack of confidence in the advice to be delivered may reduce the motivation of a HCP to take the opportunities to intervene even if they presented themselves (see 5.3.5, Motivation).

HCPs expressed their view that more funding and resources would be desirable to help address SHSe better, often viewing this intervention an as investment which would be worth the increased resources for the long-term benefits on service users' health.

"Yeah I think so. We are supposed to be giving brief intervention for weight, for alcohol, for smoking, for obesity, and if we know a couple of simple harm reduction messages or tips that we can give to the patients who smoke then I don't see why not, if time allows. Yeah, I think it would certainly help reduce respiratory problems like asthma and things, and also exposure in general, and less exposure to carcinogens in the smoke for other patients." (p7, GP)

5.3.4.3 Role and appointment type providing opportunity to intervene

Primary care consultations were considered a better opportunity to discuss SHSe with service users than secondary care consultations.

"I think that is the challenge isn't it, we are talking about it in an acute setting where emotions are too high." (p2, GP)

Many GPs felt that nurses had better opportunity than themselves to offer SHSe interventions in practice as they were viewed to have more current smoking cessation training (capability), as well as more opportunities to intervene with service users due to their longer consultation times and more frequent contact due to their role in chronic disease management. Practice nurses were also considered to have the skillset (capability) and opportunity to intervene in their regular reviews of service users, such as part of over 40s health checks.

"The only thing that I can say is that as well as GPs giving this, the place that people would give advice out is from our nurses. Because actually it is the practice nurses who do a lot of the chronic disease management so for example at my practice it's the nurses joint with doctors who do the diabetes management or the asthma and COPD reviews which would give you personal obviously smoking, are all done by the nurse […] they usually, they know the patients well because they've been seeing them for years you know every 6 months to a year" (p1, GP)

Similarly, HCAs were viewed by GPs to have more time with service users to be able to deliver more time consuming and complex interventions such as that likely required for SHSe harm reduction.

Many pharmacists, GPs and nurses felt that health visitors and district nurses who conducted home visits would also have a high level of opportunity to deliver SHSe interventions. It was perceived that consultations in service users' homes would help to provide a tool to initiate the discussion around SHS if exposure was apparent. Specialist community nurses (e.g. respiratory nurses and cardiac nurses) were also suggested to have opportune consultations in service users' homes to discuss SHSe and were likely to visit the at-risk demographic of service users due the harms which can be caused by smoking behaviours.

> *"So I think it [SHSe intervention] should be prioritised to health visitors and district nurses because they have the greatest exposure to those kinds of patients […] I think most patients would feel more relaxed if they were in their own home or being questioned about it, and I think also if there's an expectation that with the health visitors coming to see me regarding say for my child or me as a mother or say a person who is elderly is expecting a visit, maybe that response would be slightly different because you know that patient is expecting not just an assessment regarding health but maybe they would expect that the health professional is there they're going to do a wider scope of just what is this patient's living arrangements like. They would maybe expect that their health professional is going to get a better insight into that, whether it's part of their role or whether they are just being able to observe it. So maybe their response would be different because they wouldn't be able to lie about it, or maybe they would be a bit more relaxed because it's their own home." (p16, pharmacist)*

> *"GPs, district nurses I think is probably a good one. And your respiratory team in the community – I'd want know what their type of patients would be, what kind of aged group the type of patients be younger patient – I'd presume that they would. And maybe like cardiac nurses as well." (p20, nurse)*

Health visitors described their many opportunities to offer an intervention on SHS harm reduction where children under the age of 5years were at risk of home exposure.

> *"So as health visitors, we will see pregnant mums antenatal so one of our mandated contacts, and where possible, we will try and achieve between pregnancy between week 28 and 34 and try and do an antenatal contact and we will be asking mom about her smoking habits and her partner's, if she is with her partner or anyone else that she is living with, so we will first introduce that topic then if we have that opportunity. […] Then the point at which we first meet the baby is between day 10 and 14, so that again is a mandated contact so we ideally get to all our babies by day 14 at the latest, so that is one of our key performance indicators as well. Then we will see children then up until the age of 5. So our remit is under 5 essentially." (p23, HV)*

Pharmacists were viewed to have the opportunity to discuss lifestyle advice and health promotion with service users during MURs, smoking cessation consultations, as well as, opportunistically over the counter.

> *"Well in MURs you're on about the conversation that people are on… we've got I think healthy lifestyle advice if they smoke, if they drink as well, so it's just in that section as well you can touch about it there, because it's not just medication it's just lifestyle, their diet, exercise, alcohol, smoking, all that kind of stuff, so it can be brought up in there." (p15, pharmacist)*

5.3.4.4 How opportunity is affected by HCPs' social environments

Social influences including incentivisation and expectations as set by other people (including colleagues, managers, organisations such as local authorities) had the potential to influence social opportunities for HCPs to intervene. This also influenced their motivation or capability to intervene. HCPs' own perceptions of the effects of a third-party is a further example of the presentation of a particular social opportunity influencing HCP intervention behaviours.

Incentivisation by others to encourage SHSe intervention delivery from HCPs:

All HCPs reported no incentives (financial or otherwise) were given for practices around SHSe at any level, local to national. This made opportunities to intervene around smoking more difficult for primary care-based HCPs. The health benefits for service users were the only incentive mentioned by all of HCP groups interviewed.

> *"No. It's not on any of the… it's not on QOF, it's not on… there's the incentive that it's good for the health of our patients which is obviously a big incentive, but in terms of monetary incentives no, it's not on QOF, it's not on DES, it's not a LIS, smoking cessation is funded by Public Health England, it's not… and it's the responsibility of the local councils, it's not… there's no budget for it in the CCG, there's no budget for it in primary care. Smoking cessation services at the moment are awful, and seem to be getting cut and cut, which is ridiculous because it's one public health intervention that we know makes such a big difference, and it's cost effective and saves the NHS money. But there's no… it seems that there's no funding, no incentive for it at all." (p5, GP)*

> *"Secondary smoking there is no incentive for that, there is no initiative or any scheme that says look secondary smoking should be targeted." (p12, pharmacist)*

One pharmacist suggested that multiple pharmacy companies may be incentivised to offer training on SHSe for their employees if there was the prospect of generating more revenue for offering an additional pharmacy service on this. Thus, there was potential to increase opportunity to access training on the topic of SHSe for this group of HCPs.

> *"Obviously they want you to offer as many services as possible so you can generate revenue for the company as a pharmacist, so they will offer you the e-learning which I did as an employee about smoking. I am just trying to think whether or not there's stuff in… I'm pretty sure in the e-learning there is stuff about second-hand smoking, I am not sure, it will probably be a paragraph or a presentation slide with stuff. I just don't know whether the general topic is more smoking cessation and nicotine replacement therapy rather than second-hand smoking reduction from my memory." (p14, pharmacist)*

The possibility of earning a certificate or recognition of learning for continuous professional development (CPD) was felt to be an effective incentive. Though not attributed to financial reimbursement for service provision, it was apparent that HCPs' motivation to engage in SHSe intervention training or delivery would increase if the opportunity to engage was linked to an accreditation-type of incentive.

> *"Yeah, and if you pop a certificate on it when people can complete it, nurses love a certificate. We just go wild for certificates. […] Yes, yes. That is a way of really drawing people in as well. Particularly with revalidation, we are all very keen to make sure, so if it is really interesting and really interactive, then you are going to draw people in and if there is something at the end of it as well, so yeah, absolutely." (p23, HV)*

<u>Effect of others' views around the professional expectations for HCPs:</u>

Many GPs referred to campaigns led by the Royal College of General Practitioners, such as the antibiotic prescribing and sepsis campaigns where guidelines and resources to use in practice were provided. No such resources have been promoted on the topic of SHSe and so this membership had not influenced opportunities taken by HCPs to address this issue as they have with other issues.

> *"It is not a topic that the RCGP have picked up that whole well, the RCGP has a series of clinical priorities they refresh every year and unless something makes that list, it generally doesn't get a lot of exposure because as General Practitioners, there are so many priorities, everybody has their hobby horse, their particular disease area or issue that they think is the most important issue… (p4, GP)*

HCPs were of the opinion that if there was encouragement from leadership (i.e. their team leaders, practice manager, regional directors, etc.), this might act as an incentive, and

therefore promoting the social opportunity drive to deliver SHSe interventions in everyday practice.

> *"I think if it was brought up at senior meetings or is made a big public health thing and put on the agenda then perhaps, otherwise there is already so much going on I don't think it's necessarily immediately on the radar." (p8, GP)*

Similarly, some HCPs referred to the annual 'Stoptober' campaign which increases HCPs' opportunity to intervene around smoking due to this existing social influence on practice, which creates an environment that encourages SHSe intervention delivery.

> *"I think when there's stop smoking campaign I think when it starts in October everyone talks about it then. But I think these campaigns sometimes they are good in a way because they enforce you to talk about it, but sometimes say for example after October when the flu season starts and there are focuses on that instead and they forget the previous campaign. So I think the campaigns are good in a sense that they instil you to talk about it, but then sometimes they don't encourage that either at the same time, do you know what I mean? In the winter so if I'm talking about in October smoking and stuff, as soon as the winter campaign starts you're more heavily focused on that aren't you?" (p13, pharmacist)*

<u>Effect of a third party on the level of opportunity to intervene</u>:

Healthcare professionals

Most HCPs felt they were more likely to discuss SHSe with a smoking service user if a child was present in the consultation where smoking behaviours became known to the HCP, regardless of who the consultation was for. In this way, the presence of a "third party" is seen to change the social environment for the intervention and encourage delivery from HCPs. The interplay between social environment, motivation, and opportunity to intervene is captured.

"You will try to think of factors to motivate them, and having children that they should protect is one that you might ask about, do you have children? And they say yes or whatever, so you are using that as a motivating factor." (p3, GP)

"In other circumstances it can be difficult to know necessarily that the person with the smoker is exposed to secondhand smoke and I think if I am seeing an adult by themselves who is a smoker, I don't necessarily talk to them about the risk of secondhand smoke to those around them but if I see a parent who smokes with their children then it is something that I will definitely bring up. […] Yes, it does sometimes happen that in an adult consultation, they will bring the child, in which case, if it does come up then it is something else to talk about but most of the time, it is the child whose consultation it is and the adult that has come with them I can talk to about smoking as well." (p23, HV)

Similarly, HCPs were more likely to raise the topic of smoking when the smoking partner of a service user was present in the consultation in appreciation of the influence this is likely to have on the service user's own smoking behaviours and out of respect for the potential lack of agency of the service user to effect a change in their partner's smoking behaviours.

"If it is somebody who is coming in with, I can't think of an example but recurrent chest infections or something and their partner's smoking then you might bring it up." (p1, GP)

"Or if the partner's there themselves, asking them directly whether that's something they might consider and the impact that that might have" (p2, GP)

Service users

In contrast to the views of the majority of HCPs, smoking service users reported being reluctant to engage in a discussion around SHSe if their family members were present in the consultation (for reasons of confidentiality). Therefore, this could reduce opportunity to engage a service user in an intervention in these scenarios.

"Yeah, and for personal conversation, because not everyone likes to admit that they smoke. Some people smoke and their families don't even know that they do, so just having that privacy so it's not…" (p30, service user)

5.3.5 Motivation

Four themes were interpreted describing influencers of HCPs' motivation to deliver SHS-related interventions in primary care: guilt; patient-professional relationship; beliefs about efficacy; and appropriateness.

5.3.5.1 Guilt

Healthcare Professionals

Based on their past experiences, HCPs expected that smoking service users would feel guilty about the harms caused by them exposing others to SHS and anticipated defensive reactions on discussion of SHSe.

> *"Often, when you bring this [SHSe] up, the parent or the adult will be a little defensive and say, oh I don't smoke around the child, I only smoke outside, you know, I only smoke when I'm in bed or they'll often have some kind of a defensive comeback" (p4, GP)*

Most HCPs highlighted that the perceived these discussions to be "sensitive" (as presented in section 5.3.3.2) when the non-smoker involved was a child or elderly person and therefore potentially considered to be a vulnerable or at risk. In addition, some HCPs believed that not all parents who smoked may be aware of the detrimental health impacts of SHS for exposed children and when made aware they would feel guilty.

> *"I think it needs to be handled very carefully, often people aren't aware of what it's doing to their family, I think they are aware of what it might be doing to themselves but I don't think a lot of smokers are aware of what it does to their family […] It's a difficult one isn't it, because you don't want to lay on the guilt" (p21, Nurse)*

Most HCP interviewees wanted to avoid making smoking service users feel "guilty" as they felt this would undermine their work to improve and maintain patient health.

> *"Try to put it in the way where I don't demonise the families, so I am not saying you're all bad parents, I am just saying look this is the advice we give, it's proven to reduce these risks, and most of them are really receptive to that, because if you go into clients telling them and making them feel bad it works against you." (p24, HV)*

Some described not knowing service users' wider circumstances and explained that smoking might be being used as a form of temporary relaxation and stress-relief. In this instance, there seemed to be lower levels of motivation to intervene around SHSe as HCPs were aware of other priorities for service users, which links to the discussion around appropriateness for the delivery of a SHS-related intervention (see 5.3.5.4).

The prospect of eliciting guilt was a concern to most HCPs. However, in contrast, one nurse (p22, Nurse) was unperturbed by service users' potential feelings of guilt addressing the issue anyway, in a direct manner and thus, their level of motivation to intervene appeared unaffected.

> *"I would be quite honest and upfront and say you really need to think about not smoking in the same areas or giving up if you wanted to try, but not exposing your partner [to] unnecessary smoke and triggering health concerns. I wouldn't beat around the bush." (p22, Nurse)*

Whilst no HCP gave a direct example of using guilt as a tool to influence service users' behaviours to reduce SHSe, it had been used previously by one HCP (p8, GP) as part of a *"really targeted and really unusual approach"* to achieve smoking cessation for a service user

with a worsening prognosis due to continued smoking. This HCP felt that the emotion of guilt could make harm reduction messages more powerful.

> *"If you can say your son is going to be unwell because of your [smoking]…I think that's a lot more powerful." (p8, GP)*

Service users

Many service users expressed the view that HCPs often focussed on the harmful impacts of smoking and SHSe to *"scare"* them into changing their smoking behaviours. There was a sense of service users' disregard for a message to reduce SHSe as HCPs were thought to be *"lazy"* and to *"blame everything on smoking" (p27, service user).*

> *"People feel some doctors, not all doctors, use it as an excuse just say and they blame it something else to the smoking sometimes, it may be true, I'm not a doctor, I don't know but yeah I think it's a good scare tactic doctors use" (p32, service user)*

However, it was also suggested that this feeling of guilt when learning of the negative health consequences of SHSe for children could act to increase parent's level of motivation to engage in SHSe-related interventions.

> *"Make someone feel quite guilty about the situation then they will stop and they will listen and they will talk and then they will learn how to prevent it from happening, how they could help their loved-ones, coz everyone sacrifices for their loved-ones " (p26, service user)*

5.3.5.2 Patient-professional relationship

Most HCPs, including all of the interviewed GPs, expressed the desire to build, maintain and protect patient-professional relationships. This took precedence over motivation to intervene around SHSe. Indeed, where GPs felt their patient-professional relationship might be jeopardised, their motivation to intervene on SHSe was reduced. Many GPs explained that service users might not come back for future consultations, if this relationship was damaged by upsetting them with the topic of SHSe. The GP may therefore reduce the opportunity to discuss other priorities for which they had a higher motivation to address, such as other medical problems or achieving Quality and Outcomes Framework[232] (QOF) points.

> *"You wouldn't want to say "do you realise that your smoking is affecting the health of those around you?" Well they would be out the door and they never come back." (p5, GP)*

> *"If I get the feeling that this is going to shut down if I'm talking about another topic which I think I need to explore more, even if smoking is really important if I don't want to jeopardise the other topic I might just leave it be, whether I've got QOF points to fill or notifications I will leave it for next time." (p8, GP)*

All GPs wanted to avoid taking a paternalistic approach to consultations. Most felt worried that they would seem to be *"nagging"* or *"lecturing"* if they intervened around SHSe. It was feared that nagging service users might damage patient-professional relationships; consequently, this fear demotivated GPs to intervene.

> *"Yeah only if it is relevant, I think. I think it can be difficult to bring these things up, you run the risk of coming across like you're nagging them and then that can damage the relationship, so you do have to be careful." (p4, GP)*

Some GPs however, felt that there was a lack of relationship with service users due to the sporadic and opportunistic nature of consultations and the lack of guaranteed follow up, which could also act as a barrier and thus, demotivate HCPs from intervening.

> *"So, I think that I would struggle to book an appointment to get someone to come back just to discuss the smoking. I think that people come back sporadically, so you couldn't guarantee that they were actually going to come back." (p5, GP)*

In contrast, one GP described how challenging the patient-professional relationship might be beneficial and therefore work as a motivator to intervene; if they perceived this would have a positive outcome and may encourage the service user into changing their smoking behaviours. However, this participant still recognised and highlighted the desire to not lecture service users and to maintain a relationship with them.

> *"It's difficult, because what happens is what you don't want to do is come across as lecturing to them, so you have to maintain a relationship. Sometimes it's actually quite a useful thing to deliberately challenge the relationship, to deliberately irritate to provoke them into a reaction, not irritate, provoke, on the basis that you might actually get them to […] because if they are in a bit of a comfort zone with you and there are certain taboo subjects that are just not brought up, it lets them know that this is an issue and they have got a cosy relationship with you, they come and see you, but also there's a reason why you're there and what you're trying to get across and it might upset them sometimes and they might go and see someone else." (p6, GP)*

5.3.5.3 Beliefs about efficacy

HCPs held a range of views about the efficacy of a SHSe intervention. HCPs' motivation to deliver an intervention was in turn, influenced by these views. Many ideas were discussed

from both the positive and negative viewpoint, including: views of uptake and outcomes; debate on efficacy if service users are or are not ready to change their smoking behaviours; and the anticipated reaction and level of engagement from service users who were parents that smoked. These viewpoints have been presented below, with a discussion first of the positive and motivating beliefs, followed then by a discussion of the negative and demotivating beliefs.

Some HCPs had a positive view of the uptake and outcomes of intervening to help protect non-smokers from the effects of SHSe in homes, thus increasing their motivation to intervene. They felt that parents who were smokers would want the best for their child's health and would therefore be likely to engage in SHSe interventions.

> *"Parents in general want the best for their kids, and so are normally quite willing to discuss it, and look at changing." (p5, GP)*

It was felt that harm reduction messages could have a big impact on a lot of people following a brief intervention delivered in primary care settings. Many HCPs believed that *"planting the seed" (p3, GP)* would be effective, even if not straight away. Others felt that adopting harm reduction approaches could work better for service users who were not ready to quit smoking.

> *"I think that it's something you have to keep chipping away at sometimes, and it will happen for a lot of people eventually […] It could take a matter of seconds just to do, to have a big impact on a lot of people." (p22, Nurse)*

The data suggested that HCPs would have a higher level of motivation to intervene on SHSe when the service user was a younger smoking patient, as younger smokers were considered by HCPs to be more likely to change their smoking behaviours.

> *"I think probably more younger, the younger population coz they, they're the ones who can make most change in their behaviours rather than more elderly patients unless they express an interest. Probably more young, middle-aged patients" (p4, nurse)*

In addition, a higher uptake was thought likely if the intervention was succinct and relevant to the HCP's consultation, giving HCPs more motivation to intervene in these scenarios. HCPs believed that to achieve harm reduction it was needed to offer support not just information through posters and leaflets, showing HCP motivation to intervene beyond raising service user's awareness of SHSe through the use of advertising materials.

> *"I suppose if you just want to give the information then yes it could just be a leaflet and posters and things but if you actually want to use it as a reason for why somebody should stop smoking which at the end of the day will make the biggest difference to the harm reduction then you need the support." (p1, GP)*

HCPs highlighted that existing motivation to ask about smoking during asthma and COPD reviews as per usual practice, which could possibly be extended to include SHSe interventions as well.

In some cases, HCPs' belief in the possibility of a positive outcome following intervention delivery superseded concerns of sparking defensive reactions from service users.

> *"Well what I often find with most things is that you say something and people are quite defensive about it and then they go home and have a think*

about it so I think even if I get quite a negative response … I don't lose heart anymore because I think well, they're going to think about it at home and they might change their minds about it and it might spur them into action." (p2, GP)

However, there were also many views on uptake and outcomes which would demotivate HCPs to intervene on SHSe. HCPs explained their low motivation to intervene on SHSe was as a result of their experiences of service users not believing their advice on the effects of smoking; parents becoming defensive around the topic of smoking; and parents not changing their smoking behaviours despite seeing the health impacts on their children or on themselves.

" "This is affecting you," and he was like, "Well I don't think it is." " (p3, GP)

"You will see the patient records for the baby as well, and then you will notice that mothers who are smoking, their birth weights are smaller, and what happens is often I've seen is that they will be born earlier, they will spend longer in hospital. […] So, I think for a lady who is not necessarily immediately struck down by something, acutely struck down by something, maybe because of what else is going on it doesn't seem to be a priority, because nothing major has happened. So for that elderly lady she was like, "Well I am 67 what's it going to do now?" And the young mothers they're like, "Well the baby is okay, I'm okay, why is this a priority?" " (p16, pharmacist)

Many HCPs were *"dubious as to how much patient information is absorbed" (p4, nurse).*

"I might be selling my patients short here but I don't know they would go with that, I am not sure they would listen to me to be honest. … I know all about it, I enjoy it, and if I know that patient is like that fine, it might be my professional duty to bring it up but being honest I don't want to bang my head against a brick wall, I'd rather see the next patient who wants to listen. … I think it might fall on a lot of deaf ears unfortunately, even if morally it's the right thing to do." (p8, GP)

Some HCPs also felt a SHSe intervention would not be effective unless the service user was ready to change their smoking behaviours, which would demotivate them to persist with intervening.

> *"I think, yeah, I would bring it up two or three times, I think it is very difficult after that to keep going, I'm not saying that I shouldn't keep going at that problem but I think it just becomes more of a challenge because you feel like you're nagging and you feel like the patient is not going to change anyway because they haven't yet, this kind of I'm just saying it now because I have to. It does get more difficult." (p2, GP)*
>
> *"At the end of the day it's whether they want to [change their smoking behaviours]" (p25, HCA)*

Many HCPs also worried that an intervention might jeopardise patient-professional relationships (see 5.3.5.2) and some worried that an intervention might put strain on others' relationships where partner smoking behaviours were implicated. These outcomes would not be desired by HCPs and would therefore demotivate them from offering interventions. HCPs also felt the difficulty in discussing SHSe and its related harms was compounded by difficulties in proving the causal relationship between a child's illness and SHSe and also by the legal status of smoking.

> *"It's very difficult, because smoking is not illegal, and it is about… it's a bit about winning the argument with them really. I think the problem is what you're trying to do is establish causation if something was to happen to the child, and that's actually quite difficult to establish." (p6, GP)*

Others believed that smoking cessation will have better impact on health than harm reduction approaches, thus these HCPs had higher motivation for cessation promotion rather than motivation for offering SHS harm reduction interventions.

"Well ultimately probably going to have a better probably impact to get them to quit smoking altogether, so not put the cigarette in their mouth in the first place probably. So, I would probably say focusing on second-hand smoking is good, but then ultimately, we need to get them stopping smoking altogether I would say. So probably a better trump to get them stopped altogether." (p10, GP)

5.3.5.4 Appropriateness

Three recurrent sub-themes were referred to when the appropriateness of delivering a SHSe intervention was discussed: whether the intervention was needed; whether it was the primary care service provider's responsibility to deliver it as part of their job role; and whether the service user would likely be receptive and engage in an intervention. All of these factors were seen to influence HCP's perceived level of motivation to intervene around SHSe often also compounding HCPs' considerations around 'guilt' (see 5.3.5.1), the 'patient-professional relationship' (see 5.3.5.2), and their 'beliefs about efficacy' (see section 5.3.5.3).

<u>Perception of service user receptivity to intervention:</u>

HCPs had more motivation to intervene around SHSe when they felt service users were more likely to be receptive to the intervention (see 5.3.5.3). It was felt that consultations for related medical illnesses increased responsiveness and engagement with interventions due to the related focus on improving health to get better (see 5.3.6.2). Additionally, it was suggested that service users would be more receptive to interventions delivered by HCPs with whom they had a good relationship and would be more motivated to implement the advice given.

"Where you're trying to get someone to change what they're doing, you need a relationship, you need to build it up. Um for most people, I go to help

their motivation or if they've got some motivation I help them to keep going" (p1, GP)

HCPs were less motivated to intervene during first consultations with service users or in other cases where they had not yet established a good relationship with the service user (see 5.3.5.2 for detail around protecting patient-professional relationships and see 5.3.6 to see how the influence of relationship on HCPs motivation translates into future practice recommendations).

"It depends how well I know the patient. I think if you know and maybe seen other family members you might bring that into it. If you don't know them particularly, you don't tend to bring up smoking in your first consultation so when the first time you met them. I don't think it's necessarily always the best thing to do" (p1, GP)

Most HCPs believed *"Every smoker is going to be different"* (p13, pharmacist) and they would opt for a *"case-by-case"* approach to SHSe interventions (p1, GP). Furthermore, the data indicated that HCPs judge whether they feel each individual service user is ready to make a change to their smoking behaviours when deciding whether or not to deliver a smoking or SHS-related intervention. The HCP assesses whether service users seem interested in engaging with an intervention and will want to avoid disengaging the service user as this would risk losing contact with the service user. Therefore, HCPs' level of motivation to intervene was dependent on their judgement of the service user's receptivity to an intervention. In cases where service users seem unlikely to engage or worse, likely to disengage with primary care services, a HCP's motivation to intervene around SHSe was lowered.

"I think people who, when you see the instant you bring up smoking (laughing) you can almost see them instantly shut off you know they're they're just not interested. Um or people who are quite defensive right from the start um they're the sort of people where you're not going to get anywhere after the first consultation, you might after a few, but not not at that first one. And possibly by bringing in things like how your smoking affects others, it's judgement call for some people it might work for other people it might turn them off even more and then you might never get that person coming back which is what you really want to try and avoid. Um so it really yeah it depends a bit on what sort of person it is, it's not very helpful is it" "Yeah it depends, it depends a lot on the person" (p1, GP)

"You can tell by their response visually whether they're really interested or whether they're immediately in a defensive type posture, and so you look for those." (p6, GP)

HCPs' judgement of the service user's likelihood to actually change their smoking behaviours as a result of intervention around SHSe was also seen to influence the HCPs' motivation to offer an intervention (as also discussed in 5.3.5.3).

"Some you know that you're not going to make much progress, and it's better not to pursue it in my view at that time." (p6, GP)

"It depends on if they're invested or not. If they can't really be bothered then it's just going to fly over their head" (p4, nurse)

Similarly, if a HCP had previously spoken to a service user about SHSe and they were unreceptive then, the HCP may feel deterred from raising the issue with them again lowering the HCPs' motivation to intervene.

"But if you see in the notes that they have been asked recently about it in the last consultation in the last few months then you probably wouldn't ask again unless it says review in a few months or consider in a few months then you might, otherwise you probably wouldn't ask again if you know it's only been recorded and asked about recently." (p7, GP)

Service users' own agenda for their consultations also affected HCPs' motivation to intervene around SHSe, in addition to influencing opportunity to intervene (section 5.3.4). HCPs will be more motivated to address the service user's points of concern than intervene on SHSe in these instances.

> *"So again, it depends on what the parents' um and what their agenda is because um they might have something that um is very specific to what they're worried about what they're concerned about and (laughs) obviously we need to address that. (p1, GP)*

> *"I think not necessarily unless they have come in with a partner that is not very pleasant, and pushy, and their agenda is something else." (p11, GP)*

HCPs' had a lower level of motivation to intervene when there was less likelihood of an intervention being implemented by the service user or when they felt the service user did not have the agency to implement changes to reduce SHSe at home. An example was given of an Asian women who reported was less likely to have agency to change her husband's smoking behaviours in the home, so it would not be appropriate to deliver the message to her even if she was bringing their child in to primary care service with a SHS-related medical illness.

Similarly, a service user's attitude would influence HCPs motivation and thus impede opportunity to intervene in some cases.

> *"If you've got somebody who is a bit aggressive. Because you can get people with you who their personalities are like that or for whatever reason the rest of what is going on in their lives […] It would be judgement call on the conversation but then you would potentially then not go further." (p1, GP)*

> *"Whereas if they are not in the room the message will be muddied and lost and maybe not even spoken about at all." (p8, GP)*

Healthcare professionals would also refrain in instances where they would feel embarrassed for not being able to offer advice and support. Providing evidence that motivation can be influenced by level of capability to intervene.

> *"So, you generally tell more information I think before, coz then you look silly then. You explain all this stuff and they say what am I supposed to do and you're like I don't know." (p4, nurse)*

Perception of job role:

Some HCPs felt it was part of their job role (motivation determined by their views on capability section 5.3.3.1) to intervene around SHSe, thereby motivating them to intervene. SHSe was widely considered to be everyone's responsibility to raise awareness on the issue and therefore making every contact count to help reduce harms caused by SHSe.

> *"But I think it's probably the role of anyone that has patient contact to think about it […] I think everyone has got a signposting role, to signposting to smoking cessation, and the rest I guess is dependent on how confident they feel with the topic or the risks and all the rest of it. But I think bringing it up and signposting everyone should do even if the bits in between are omitted." (p2, GP)*

> *"So, I think back to the public health to making every contact count before, this would be under the same heading to make sure everyone is trained, and then whenever patients come whoever they see that contact is counted by asking about it." (p7, HV)*

HCPs felt that asking about and recording SHSe was a simple task. This optimism for intervening suggested HCPs have motivation to intervene. Motivation was thought to be higher for those in job roles likely to foster a long patient-professional relationship by seeing the same service user over time.

"The examples I gave about what you can do to harm reduce for the children for example, that's such bread and butter stuff, it should be part of your core ability to do your job." (p8, GP)

"I think everyone who is healthcare trained so that includes healthcare assistants, and advanced nurse practitioners, ANPs, physician associates, GPs, and practice nurses, all those healthcare professionals potentially are going to work in primary care, they are all healthcare professionals who will have contact with patients, and I think it would be quite a simple thing to record and ask." (p7, HV)

Whereas, those with who did not see service users over time in their job role were less motivated to intervene due to the lack of relationship with the service user which also affected their view of service user receptivity, as described above.

"You need a relationship; you need to build it up … from that point of view it would be the nurses who would be better than the GPs." (p1, GP)

Despite believing it a part of their job role to intervene, some HCPs felt that the demands of their role meant they did not have the opportunity to intervene, which in turn lowered their motivation levels. Hence, HCPs' motivation to deliver an intervention is influenced by HCPs' perceived capability and opportunity to intervene. As discussed in section 5.3.4.3, many interviewees felt that GPs did not have the time to intervene and deliver SHS harm reduction messages. Many GP and pharmacist interviewees felt that health visitors and district nurses had the most opportune consultations to intervene. Therefore, these groups sometimes showed a lower motivation to intervene on the topic of SHSe, as they believed others were better placed to deliver this intervention.

"I think it would be a mistake to think that GPs would be able to do all the things that we would like them to do" (p6, GP)

> *"So, I think it should be prioritised to health visitors and district nurses because they have the greatest exposure to those kinds of patients." (p16, pharmacist)*

Some HCPs viewed preventative medicine as a luxury. They described how SHSe would go to the end of the list of medical priorities, indicating a lower level of motivation for SHSe interventions than other topics for interventions in primary care, particularly in light of limited opportunities.

> *"Always want to do anything that's going to improve the health for people, but I wouldn't say it was a major priority […] I think if you've got other things you got to discuss in your consultation's got to go end of the list." (p1, GP)*

Interviewees also described the many particular interests that primary care-based HCPs might have. In cases where the subject of interest was not linked to SHSe or smoking, HCPs were felt likely to have a lower motivation to intervene on the topic, preferring to intervene in their chosen areas of interest.

> *"I am probably the most interested person in smoking cessation in our practice, and we've got five doctors working routinely. I generally have no confidence that the other doctors would take it on board to carry on, they have all got their own interests and want to do what they want to do. It needs someone like me just to beat the drum" (p8, GP)*

<u>Are SHSe interventions needed?</u>

Healthcare Professionals

Most of the HCP interviewees recognised that SHSe was *"still an issue" (p1, GP)* and this recognition of importance supports HCPs are motivated to intervene on the topic. In

addition, HCPs highlight that intervening around SHSe is the right thing to do. Some HCPs felt that there was a good level of public awareness of the risks of SHSe, which would positively impact service user's engagement with an intervention. This in turn seemed to increase the HCPs' motivation to intervene.

> *"I would be morally right advising to quit smoking I think if that's the right phrase to use, I'm going to be scientifically right as well." (p8, GP)*
>
> *"I think it would definitely be a good one to bring up […] it's obviously having a large impact and going unknown in a way." (p17, pharmacist)*

Some HCPs felt that it might be more important to intervene around SHSe on the diagnosis of a new medical condition. Therefore, they had more motivation to intervene in these instances.

> *"They have accepted that risk rather than addressed it before, but then in their life, having a new condition, might be directly affected by that" (p2, GP)*

However, as discussed in section 5.3.5.1, some HCPs made reference to service users' wider situations and anticipated that some smoking parents may have difficult social situations and lots of existing stresses, expressing a view of frustration that addressing SHSe was difficult in these scenarios and would involve a complex behaviour change process.

> *"So, I think you've just got to give them the support, give the mother support, why is she smoking, is it because her family life is so bad, their social situation is so bad. This is where general practice is a frustrating experience in many ways, that you know that actually the issues relating to the patients, the health issues related to the patient have a strong component will be their social situation, finances, where they are living, might be neighbours, it might be family. There's no prescription for that apart from letters to say look this is affecting so and so, it's affecting the child and so on." (p6, GP)*

Others highlighted that SHSe interventions were difficult to deliver in cases where smoking or non-smoking service users were housebound or if health benefits were unlikely to be seen as the harm reduction approach would be difficult to promote in these scenarios.

> *"They will look at it for the fact that well I'm used to living like this now, I'm housebound, this is my only pleasure, so it can be really hard." (p25, HCA)*

Service users

Service users agreed SHSe interventions were needed, indicating motivation to receive SHSe interventions in primary care. All interviewees would welcome discussions to help them to reduce SHSe. The service users' views on content and acceptable formats for interventions to build on this motivation to receive interventions, has been presented in section 5.3.6.

> *"So yes, I still think it [SHSe] ought to be spoken about." (p28, service user)*
>
> *"Yeah, because it's interesting […] It would be really useful to know" (p31, service user)*

5.3.6 Intervention

All of the interviewees shared their views and suggestions for future interventions which might be delivered in primary care settings to support reduction in SHSe for non-smokers in home environments. These are presented below (combined from HCPs and service users data) and show thoughts on: the desired goal(s) from a SHS-related intervention; whom the intervention should be delivered by; which groups of service users it should be delivered to; the recommended timing for interventions; and the elements that an intervention should include. All of the qualitative data concerning intervention suggestions have then been structured into example vignettes detailing what a future intervention might entail (section 5.3.6.5). The combined data regarding current intervention practices and recommendation for future practice in relation to SHSe were used to develop five vignettes which might be used as potential intervention models for further development and testing in the future. These five proposed interventions are presented according to the TiDIER framework[233] (Appendix 5.17).

5.3.6.1 Desired goal(s) from a SHS-related intervention

Interpretation of the data suggested that HCPs were interested in and understand the importance of reducing SHSe levels. However, most HCPs referred to smoking cessation as the target outcome to achieve SHSe harm reduction. Generally, the HCPs felt that it was important to highlight the need to reduce SHSe levels and to offer motivation and support for service users to enact the required behaviour changes.

> *"So, some kind of brief intervention to get people to shift to that contemplative stage, and then some intervention to help people with action planning and maintenance" (p5, GP)*

Two HCP interviewees, had slightly different views, suggesting that the aim should always be to achieve cessation and that harm reduction techniques should only be used to support service users in their quit process (p10, GP and p19, pharmacist).

> *"So, I would probably say focusing on secondhand smoking is good, but then ultimately, we need to get them stopping smoking altogether I would say." (p10 GP)*

Similarly, only one smoking service user explained an aim to quit and therefore, wanted an intervention to focus on cessation as the target outcome (p27). Most of the service users were interested in receiving an intervention to help them to reduce SHSe without an expectation to quit smoking.

5.3.6.2 Delivered by whom

SHSe was considered to be relevant to primary care services by all of the interviewees.

> *"I think it's more something in the primary care setting, because for us we directly deal with patients, we become part of their lives. They come into us just to have conversations about random things that are going on in their lives, so I think we would be more impactful in that way. So, I think it's something that needs to be introduced in the primary care setting so that we can help more people." (p19, pharmacist)*

Most HCPs believed that SHSe interventions should be delivered by all members of the primary care team to some extent. It was felt that interventions would be more effective and would be better received if the same stance was taken and was delivered consistently across all services rather than by a single service alone within primary care.

> *"Then that person [service user] knows it's a real issue rather than just one person's bug bear" (p2, GP)*
>
> *"I think consistency is quite important. So if one person [HCP] says secondhand smoke is really important to think about, and have you thought about this, that, or the other, whereas somebody else says, 'oh don't worry about secondhand smoke', then that inconsistency patients pick and choose whatever they want to hear" (p9, GP)*

This approach was acceptable to some service users who indicated they would be happy to receive an intervention from any member of the primary care team as it was expected that the messages would be the same regardless of who was delivering it.

> *"Anyone, it doesn't matter really. If they know the same type of information then it doesn't really matter who speaks about it" (p31, service user)*

However, other service users were in agreement with some HCP interviewees and suggested that some HCP roles were better placed for the delivery of SHS harm reduction messages. Some smoking service users reported feeling judged by health visitors who they perceived would be assessing their parenting ability, thus they were not keen to discuss SHS with their health visitor. However, a family support worker was considered to be an ideal professional to deliver a SHSe-related intervention as they had a much better relationship and the consultations were much less formal and assessment-like. This indicated that service users' perceptions of HCPs' knowledge base and skillset as well as their relationship with the HCP influenced their choice of whom should deliver an intervention.

> *"Best one so far is a family support worker, but as I said not many people have family support workers. Definitely not health visitor, because it all just gets noted down. That's the only person, unless a family doctor you have known for…someone that you have known for years and that you think maybe a doctor, maybe. That's it really." (p29, service user)*

Some HCPs suggested that different levels of intervention could be given by different members of the primary care team. All could give a common and consistent message during initial discussions on the topic of SHSe with some HCPs signposting to resources and services for further advice and support. However, it was felt that some professions might be better suited in their role, opportunities and their relationship with service users to offer support beyond simply signposting. Nurses who had longer consultations and repeating review appointments with service users were considered well placed to offer individualistic support around SHSe. Furthermore, district nurses and health visitors who made home visits as part of their consultations were felt to have good opportunity to address SHSe albeit as highlighted above they would need to have a non-judgemental approach. Pharmacists were also considered well placed due to the ease of access in getting a consultation and also due to their familiar position within communities.

> *"Pharmacists because we're quite well placed in the healthcare setting and quite easily accessible to have those type of conversations, so I would say that or maybe the nurses … they are probably the ones best suited to deliver it" (p17, pharmacist)*
>
> *"The GP is only ever going to have an opportunistic chance to maybe have a brief discussion and signpost them on" (p10, GP)*

One HCP (p5, GP) did not feel comfortable in signposting service users to another service for support as it was felt that this action would undermine the importance of the issue by not addressing it directly and also due to an anticipated lack of follow up by the service user to access these supporting services.

It was suggested by one HCP (p6, GP) that SHSe interventions may be better delivered by only those primary care teams who provide services in areas of high smoking prevalence, suggesting that any future intervention training be delivered to those most likely to have consultations where SHSe is relevant to include in the discussion.

Some discussed how the topic of SHSe presented an overlap of primary care and public health priorities. There were many references made by both HCPs and service users to public health mass media campaigns and also to messages delivered in schools. These participants often suggested a possible integrated approach to support and emphasise the SHS harm reduction messages that might be delivered in primary care settings.

> *"I would probably say the biggest impact I would probably pick up on with regards to secondhand smoking is the advertising that goes out on the TV for example [...] So yeah advertising would be one, but that's probably not something we would do as, so that would be a public health advertising wouldn't it? That would be an intervention." (p10, GP)*

5.3.6.3 Delivered to which groups of service users

There were differing views on which groups of service users would be best to target with an intervention to support reduction in SHSe for non-smokers who live with smokers. Whereas some interviewees suggested a universal approach, others indicated that particular populations (e.g. service users who were parents) might be better to target for the delivery of SHSe interventions, as detailed below.

<u>Universal approach:</u>

Some HCPs felt that non-targeted messages should be delivered to all service users who accessed primary care services. The use of resources such as appointment cards and waiting

rooms screens could be used to deliver information which could then be followed up by service users themselves if they were interested. Most service users felt that they would like to receive information and then choose to request further advice from a HCP when they felt ready to make a change, which fits with this generic and non-confrontational style of message delivery to a broad audience. Healthcare professionals also felt that the use of generic visual aids would help to instigate a discussion on the topic of SHSe more easily. Additionally, this use of a universal approach was believed to avoid appearing judgmental when raising the topic of SHSe with a service user as was desired by most HCPs. HCPs and service users explained that it was sometimes difficult to know who would be at risk of SHSe and therefore, who would be an appropriate target to receive an intervention around SHSe. This was thought to be a particular problem when a non-smoking adult was at risk of SHSe. However, offering a generic intervention was thought to potentially overcome this problem.

> *"So, smokers I guess would be targeted as well as people, adults, who are exposed to secondhand smoke, but that's very broad." (p5, GP)*
>
> *"Basically, it's everyone really…I think with the kids you should tell them how it impacts the parents, opposite, and the parents and the elder lot should know how it impacts the kids." (p26, service user)*

Medically relevant consultations:

In contrast to the proposed generic or universal approach, some HCPs and service users felt it would be appropriate to deliver a SHSe intervention in consultations with medical relevance to their smoking behaviours or to their exposure to SHS. As with the use of visual aids, HCPs felt that it would be easier to start a discussion around SHSe if it fitted into the conversation and they felt less presumptive and judgemental if there was a medical reason

to raise the topic. This approach aligns with service users' wish not to discuss SHSe when it did not seem relevant to the consultation. It would also avoid the description that some service users gave of HCPs *"ramming it down their throats"* by giving SHSe information when it was not directly relevant to consultations *(p28, service user)*.

> *"Maybe if their kids had asthma…or maybe I suppose probably any health implications that you think it could have on those around them, but it's a bit hard to bring up as well, so it's having the conversation as to how do you phrase the question as well." (p15, pharmacist)*
>
> *"Say if I had a chest infection more than willing to speak to them about it, but not for irrelevant things." (p31, service user)*

Parents:

Parents were identified as a key target group for SHSe interventions by the majority of interviewees. Healthcare professionals reported that the effect of SHSe on children's health could act as a powerful emotive driver to support SHS harm reduction messages. In addition to having more incentive to change their behaviours, HCPs felt that parents as a group were more likely to see the impact of these behaviour changes in the health of their child(ren). In addition to this, it was believed that parents would also be a good messenger to share information on the topic of SHSe with those around them, thus helping to raise awareness of SHS harm reduction within the community, which HCPs felt was not currently well known (see 5.3.3, Capability). Although it would be ideal to target smoking service users before they become parents to prevent all SHSe, it was suggested that mothers would be a good target recipient for an intervention after birth as this was thought to be an opportune moment to enquire about smoking in the home. However, one participant highlighted a scenario in his experience of a mother who did not have the agency to reduce harms from SHSe in the

home (p8, GP). Furthermore, there was a perception that smoking mothers of a new baby were less likely to get an opportunity to smoke outside the home due to their caring responsibilities (p29, service user). Smoking parents were thought to be typically within a good age range to be likely to want to change their smoking behaviours. Thus, an intervention delivered to young and middle-aged parent service users was considered to potentially have more positive impacts than interventions delivered to elderly or school-aged service users. Despite the recognised challenges in delivering an intervention to school children, one HCP promoted the importance of sharing SHS harm reduction messages with teenagers who would later go on to become parents (p24, HV).

> *"The more complicated you make it to select and target the groups the more complicated it would be, so I think maybe just parents and people who are living with someone" (p3, GP)*
>
> *"I think it's the young parents really, young parents mainly." (p25, HCA)*
>
> *"I would say everyone, but particularly people with kids, even when you've got a few kids, especially new mums… But even when someone smokes and they are in their own home all that smoke is still in the house, so I think it should be there for everyone, but there should definitely be more support for the new mums before they get to the place of having that little bit of time, and just families in general, people that live with other people." (p29, service user)*

<u>Smoking service users only:</u>

Similar to the opinion that parents who smoke would be a better target than non-smoking parents, the majority of HCPs felt that smoking service users rather than non-smoking service users should be the target of a SHSe intervention. Only one HCP (p17, pharmacist) discussed the possibility of intervening with non-smokers suggesting that this would involve

asking them to bring their smoking partner with them to a subsequent consultation for an intervention.

> *"Generally speaking I imagine it would probably be tailored to the smoker because it's hard to…if the smoker is not in the room for example it's hard to tell someone that what someone else is doing is bad for them, and you've got to go ahead and try and sort it out, because again I'm not in the problem saying your husband smokes, you should tell him not to, that's putting you in a hard position because maybe you don't have authority at home." (p8, GP)*

Many interviewees felt that SHSe interventions were appropriate to deliver to smoking service users who lived with or around potentially vulnerable groups of non-smokers: children, the elderly, pregnant women, and those in mental health care facilities. Pets were also identified by two service users as an at-risk group which would offer an emotional driver to reduce SHSe levels in the home (p30 and p32).

Service users felt that primary care HCPs had a "duty of care" (p32) to non-smokers to offer an intervention to those whom they identified as smoking service users. This view was echoed by many HCPs who felt that all HCPs had the responsibility to address the issue of SHSe when they discovered a service user was a smoker and exposing others to SHS. It was suggested by some HCPs and service users that SHSe interventions should be added on to existing cessation advice which is offered to smoking service users. Many HCPs felt that with the appropriate training they would be able to encourage those service users who were not ready to quit to employ harm reduction strategies instead, in cases where the offer of cessation advice and support was declined.

> *"But I think some of those skills we already have from bringing up smoking with that person are transferable to bringing up secondhand smoke, the open questions like I know that you smoke and you're not ready, so you*

think that your smoking is affecting anyone else or whatever. But any training is good, so maybe a bit more on that." (p3, GP)

5.3.6.4 Recommended timing for intervention

Recommendations on the intervention intensity:

Views are intervention follow up over time differed across the HCPs. Some HCPs, namely those with experience of providing smoking cessation services, suggested that a similar timeframe of support be offered to those wishing to reduce SHSe levels. The example was given of offering follow up every week for a six- to eight-week period (p17, pharmacist). In contrast, some HCPs believed that SHSe intervention only needs to be discussed on a singular occasion.

> *"I don't think it's something that needs to be discussed again because it's not the focus of the consultation. The focus of the consultation would be to stop the smoker from smoking and it's just that passive smoking comes in there because of the effect they are having on other people around them" (p19, pharmacist)*

This mixture of viewpoints on intervention follow up was echoed by the service users. Most felt that one appointment would be sufficient for the delivery of an intervention in primary care as this would successfully convey the important information to the recipients.

> *"I think it's okay as a one off, because I don't understand what they could say different to the first conversation. So yeah I would definitely probably say as a one off, just the risk factors behind it and why you should or shouldn't, and it can cause problems for I suppose your family, your loved ones, being around people who don't smoke, and especially if they've got medical conditions already. So maybe just give them knowledge about the topic would probably be sufficient, but I can't see why they would need to have more than one appointment for that." (p30, service user)*

However, other service users felt that further support given over time was necessary for those who wished to implement an intervention and to lead to an effective and sustained reduction in SHSe for non-smokers in the home.

> *"Uh yeah, like I say it's easy for people to take things on then forget, so I think if the persons genuine wants to do it is serious about it, yeah I think a follow up is important." (p32, service user)*

Many HCPs believed GPs would not have the time to undertake a complex intervention and to provide follow up opportunities to help service users to reduce levels of SHSe. Therefore, it was widely felt that any complex intervention requiring follow up should be delivered by service providers who had more time with service users, such as nurses, if a SHSe intervention was to be designed in this format. Pharmacists recommended the use of a staged intervention approach with follow up as a suggested intervention for delivery from pharmacies.

> *"I think we should do a campaign; we should leave it for about a month and try and get a consultation within the first month and then a referral back to provide whether a prescription or items for this patient […] once it's in the system then we can monitor it […] I think then a weekly basis." (p12, pharmacist)*

<u>Recommended time points to intervene:</u>

There were a range of suggestions as to which consultations would offer the best timepoint for SHSe intervention delivery. The general consensus amongst HCPs indicated that an intervention could be made at any time point in the primary care setting so long as the intervention was realistically feasible to deliver.

> *"What you're trying to do is trying to give them something which they can implement in practice without actually overwhelming them" (p6, GP)*

One HCP (p7, GP) drew reference to the 'Very Brief Advice' (VBA) that is offered on the topic of smoking cessation and suggested that SHS harm reduction messages be delivered in the same format directly after the cessation VBA. It was also suggested that HCPs could utilise their many and varied consultation opportunities to raise the discussion around SHSe, regardless of whether these were planned or opportunistic.

> *"Most approaches are okay, the planned and the opportunistic are fine" (p4, GP)*

Although, some HCPs recommended that a rapport is first built with the service user before initiating the discussion around smoking behaviours and SHSe. Many HCPs promoted using routine appointments with known service users to start the discussion, i.e. the discussion would be embedded into normal clinical practice during targeted developmental checks for babies and children.

> *"I guess they might be a GP for the baby check, or if there's a health condition, they might see the nurse if they're coming for immunisations at six weeks and six months and a year old baby, so I guess they are opportune moments to get done. You will have the health visitor going out and they will be seeing the child at home" (p10, GP)*

Healthcare professionals were considered to be able to use their experience and discretion to gauge whether it would be appropriate to discuss SHSe in a consultation, how much information to convey and whether or not they felt it suitable to follow up the initial conversation in a subsequent consultation. Some HCPs preferred that SHSe intervention be

delivered in *"high risk consultations" (p7, GP)* when the topic seemed of relevance or when service users were presenting with an exacerbation of illness, especially if this was a recurring exacerbation and there was a possible causative relationship with SHSe.

There was little reference made to pharmacists' time availability to intervene on SHSe by other HCP groups. Most of the interviewed pharmacists suggested that an intervention might also be embedded within routine consultations, including MURs and appropriate NMS appointments, and might be incorporated into the generic lifestyle advice that is offered to service users in these consultations.

Time length of a single intervention:

Many HCPs recommended that any future SHSe intervention should be kept very brief. It was suggested that the intervention should be of similar format to the existing smoking cessation VBA and be delivered within 30 seconds at the end of the cessation VBA. However, not all interviewees (HCPs and service users included) were in favour of a singular brief intervention.

> *"A brief intervention 30 second message on advice in terms of harm reduction" (p7, GP)*

5.3.6.5 What should a SHSe-related intervention include?

Recommendations for what the intervention should involve:

Recommendations about the structure for a future intervention ranged from very broad, universal messages to service user-specific, personalised intervention and monitoring. Many

HCPs recommended a mixture of approaches and some suggested the use of interventions comprising of different stages.

The use of untargeted messages were suggested by many HCPs and included the use of: messages advertised on pharmacy health boards or GP waiting room TV screens; messages written on the back of appointment cards or repeat prescription scripts; handouts distributed to service users in every consultation; a monthly information stall in reception areas; and visual aids on display to the public. These broadly advertised messages were perceived to be successful in raising awareness on the topic of SHSe for both HCPs and service users in primary care settings. Furthermore, these universal messages were felt to potentially side-step the sensitive nature as a barrier to initiating discussions on SHSe and offer segue in the consultation to bring up the topic. Alternatively, service users had the option to follow up the message themselves with their HCP when they felt comfortable to discuss the topic, they had the chance to arrange a consultation for follow up of the issue.

> *"Because we're a healthy living pharmacy as well, and we get content from the NHS every month to put up on our health boards, I don't see any of that on the health board. So that's probably something that I would like to see more of to make the public more aware of it as well." (p19, pharmacist)*

Some HCPs suggested they could embed SHSe harm reduction messages as part of generic lifestyle advice delivered to all service users, particularly those with conditions requiring regular reviews. For most HCPs, asking service users about their smoking status as part of consultations was a *"knee jerk"* reaction *(p1, GP)*. Moreover, most felt they could extend this to deliver a brief extra script or a few more questions into the normal routine format to address SHSe also.

> *"So, as part of that you are prompted to ask those healthy living advice that you give, and then if you find that they are a smoker themselves or they have got someone in the family or they are living within someone that is a smoker than that could open the conversation up a bit that." (p17, pharmacist)*

A suggestion made by both HCPs and service users was to deliver SHS harm reduction messages together with existing smoking cessation advice and support, thereby easily targeting specifically those service users who smoked for the harm reduction message delivery. Similarly, training for HCPs on the topic of SHSe could also be added to the existing smoking cessation training.

> *"I suppose if they're doing it part of the stop smoking service I think they definitely should include it because over the years the topics come about and a lot of people are now aware of passive smoking […] I think it's definitely an excellent topic to bring up, especially if you're providing a service and helping others quit" (p30, service user)*

Signposting service users for further and more specific support was a common suggestion made by all HCP groups. It was widely felt that signposting was core part of HCPs role in the primary care sector to help support reductions in SHSe levels.

> *"I think everyone has got a signposting role… and the rest I guess is dependent on how confident they feel with the topic or the risks and all the rest of it." (p3, GP)*

All HCP interviewees emphasised the need for brief interventions. Furthermore, it was believed there would be a better uptake and effect from a brief intervention.

> *"I think you probably want something fairly brief; you just want to get across kind of key messages. Key points, something that is not too laborious*

where what you are really trying to say kind of gets lost in it, so quite concise really." (p23, HV)

"Brief interventions are easier, and they can be evidence based, and I think that you wouldn't have any problems in getting people to deliver them, because they are easy and quick and don't cost anything, and if they're evidence based and people know that it's actually going to make a difference then people are going to do it. But you need to think 30 seconds." (p5, GP)

The use of a brief intervention similar to the recommended VBA for cessation was recommended to address SHSe in primary care settings. It was suggested that this VBA might be followed up with a structured programme as a second intervention to support and maintain the change in smoking behaviours. This might be provided by a different service of HCPs, e.g. GP might do VBA and refer to community pharmacy for follow up.

Indeed, most HCPs suggested the use of a brief intervention involving a small amount of verbal advice followed by the provision of an informative leaflet and signposting to supportive services. These approaches were considered by the majority of HCPs to be *"good easy ways to get this message across" (p4, GP)*. This approach would be more of individualised messages given to service users with the option of follow up for further advice and support tailored specifically to the individual. This mixture of approaches used to give an individual tailored intervention met a service user's recommendation: *"I don't think there's a right or wrong way about it but I think it depends on the person." (p32, service user).*

"I guess it depends on what the harm reduction intervention is. I think there's two things, there's the asking about the second-hand smoke exposure, which is just the asking about it, and recording it, and then there's the harm reduction message, so there's two things there. Ideally I guess you want to give it all in… you want to do that all in one, which will take a bit of time but you want to ask about it and then you want to go with plan A first

and ask about signposting them to public smoking services and ask that first … and then the plan B of the harm reduction. " (p7, GP)

However, some HCPs also discussed the use of more time-demanding, individualistic support for SHS harm reduction, in light of the time required to change service users' beliefs before helping them to change their behaviours.

"At least there is the GP input that might just push the patient in the direction, nudge them in the right direction […] the patient has certain health beliefs, they come in with certain beliefs, and there's no point me turning around and saying no you're wrong, it's this. And it might take multiple visits." (p6, GP)

Additionally, a GP (p9) suggested using text messaging to deliver information to individual service users, particularly those who were younger smokers. Similarly, a service user (p30) also felt that the use of technology to deliver information over the phone or on the internet might be preferable to young service users who smoked.

There was also mention of delivering a health campaign in non-primary care settings (in schools, hospitals, pubs and bars) but by primary care providers (p13, pharmacist).

<u>Supportive measures for implementation:</u>

All HCPs requested more time to deliver interventions as a supportive measure to increase their intervention opportunity and subsequently help the HCPs to implement SHSe interventions in practice. Most HCPs also requested further training to increase their capability to intervene by gaining awareness on the topic of SHSe and their knowledge of how to address the issue and where to signpost to for provision of further support. Training on motivational interviewing was seen to be desirable for many of the HCP interviewees

with the benefit of helping them to support service users to make behavioural changes which reduce SHSe levels, as well as offering a transferable skill which can be used in other areas of health promotion. Video examples were also suggested as a format for delivering training on motivational interviewing.

> *"Facts and figures yes, facts and figures, and then I guess it comes across all sorts of… it's actually learning how to motivational techniques, so actually saying how to… if they are not ready just planting the seed as well. But just motivational quitting and stuff as well, so probably the two, one is facts and one is actually generic training on how to help people improve their lifestyle really." (p10, GP)*

The optimisation of any training on SHSe for use as evidence of CPD was requested by GPs, nurses and health visitors. None of the interviewed pharmacists mentioned CPD as an incentive for training on SHSe.

> *"Some education, some CPD for us, and then in terms of what to give it depends on exactly what the intervention is, but time and support and money to provide that intervention but this is all pie in the sky." (P5, GP)*

> *"Yeah, and if you pop a certificate on it when people can complete it, nurses love a certificate. We just go wild for certificates." (p23, health visitor)*

Furthermore, using existing clinical systems to support HCPs to intervene on SHSe was requested. Many HPCs suggested that clinical systems might be used to provide prompts to ask about SHSe and a resource to record any SHSe interventions. It was also suggested that three or four simple question requiring a 'yes' or 'no' answers be added to the clinical system (to be asked with each service user consultation) to increase HCPs' capability to intervene in practice.

> *"It wouldn't do us any harm to give us a list of questions, not questions but prompts." (p21, nurse)*

Some HCPs referred to the wider clinical information and guidance available on clinical systems. They requested that a brief informative leaflet specific to SHSe be made accessible on their systems or as a web resource. Some suggested having one leaflet as information for the HCP and another which could be printed and handed to service users. Some HCPs highlighted the importance of using language that could be easily understood by service users in these informative leaflets; whether by avoiding medical jargon or by opting for culturally sensitive leaflets made available in different languages.

> *"Information that's clear and concise that then they can forward on to their patient. And not too as well that's too heavily full of medical jargon as well. The sort of people that you're talking to won't always understand what you're talking about." (p20, nurse)*

> *"For me what would be really useful is an up to date easy to read multiple language website and/or leaflet that's really succinct." (p8, GP)*

In addition to leaflets, many HCPs also referred to the use of posters in waiting room as a supporting material to help advertise and raise awareness of SHSe. Interviewed HCPs with a nursing background and who conducted home-visit consultations (p20, nurse and p23, HV) indicated their preference for online resources rather than paper resources because *"sometimes patients can be bombarded with paperwork" (p20, nurse)*. Moreover, *"something online that can be updated regularly and is more accessible"* might be considered a better resource than paper alternatives (p23, HV)

Consistency in the messaging being delivered was felt to be a supportive measure in helping HCPs in the delivery of SHS harm reduction messages by all HCPs. Furthermore, the use of

wider media to deliver messages to those who do not access primary care services was thought to be helpful with TV adverts in particular considered more effective in sharing the message of harm caused by SHSe.

Service users suggested the use of groups (p27), updated leaflets (p32) and text message reminders to help support them to implement SHSe harm reduction messages (p30). There are useful suggestions of formats for a SHSe intervention as deemed acceptable by the interviewed service users.

Training recommendations to support HCPs to deliver SHSe interventions:

Across the HCP interviewees, most felt that some further information and education would be desirable to better enable HCPs to deliver SHSe harm reduction messages. Firstly, HCPs requested training on when and how to begin the discussion around SHSe in consultations. A brief script or listed question prompts were requested by some HCPs to exemplify raising the discussion. Furthermore, one HCP requested training on how to increase service user engagement with an intervention (p16, pharmacist). HCPs requested knowledge of recommendations which they could then relay to service users to reduce SHSe levels. One HCP also sought information on how to quantify exposure to SHS (p2, GP). Moreover, HCPs requested information on where they ought to signpost service users to for further support in achieved reduced SHSe levels in the home.

> *"Just really two elements basically, I need the knowledge about risks, and then to be able to counsel somebody, so not just counselling a patient but counsel a mother, because you would need slightly different skillsets, especially say somebody is a really young mother. Not to make assumptions about class, socioeconomic things but maybe a young single mother who lives on a council estate, nothing going for her, and then somebody comes*

along with all this information how do I make it a priority for her?" (p16, pharmacist)

Only one HCP felt strongly that no further training or education was required to support HCPs to deliver SHSe interventions in practice.

> *"If they are just a GP we should be able to just have a very brief conversation or a very brief advice about second-hand smoke or smoking in general to say why it isn't good, what you can do around it, so the examples I gave about what you can do to harm reduce for the children for example, that's such bread and butter stuff, it should be part of your core ability to do your job. If we need extra training for that it's a pretty sad state of affairs I suggest, but we are where we are." (p6, GP)*

<u>Points that service users want to learn from an intervention:</u>

Service users were looking to gain a better awareness of the harms caused by SHSe and also of the measures that might be taken to prevent these harms but also to firstly prevent non-smokers' exposure to SHS, particularly when the smoking service user was alone and caring for a baby. Two service users specified an interest in learning about the health effects of SHSe for pets in the home. There was also an interest in learning of the financial implication and repercussions for SHSe in different environments for example the fines for smoking on public transportation vehicles.

> *"It would be really useful to know quite what the extent of the damage that passive smoking does, yeah the damage that it does do to everyone. So, it would if there maybe was some leaflets that you could take away to find out the extent." (p31, service user)*

<u>Summary of findings relating to what a SHSe intervention should entail:</u>

The combined data regarding current intervention practices and recommendation for future practice in relation to SHSe that were collected in this qualitative study were used to develop five vignettes. These vignettes structure the above findings (presented in section 5.3.6.5) according to the TiDIER framework[233]. The vignettes use the qualitative data findings to suggest potential intervention models for further development and testing in the future. These five proposed interventions are presented below (Table 5.5) and are expanded in full detail in Appendix 5.14.

Table 5.5 Overview of vignettes developed from the qualitative data in the theme 'intervention'

Vignette number	Type of intervention	Overview of what is involved for each vignette
1	Indirect, broad, untargeted approach	A broad and untargeted approach would offer a conversation starter to help HCPs to raise the topic of SHSe with their service users. This would aim to also encourage service users to raise the topic themselves with HCPs, when they felt ready to receive information and harm reduction advice after having seen a broadly advertised and untargeted message.
2	Direct, brief and untargeted approach	The brief message allowing HCPs to remember a small script of points and questions which is succinct and easier to deliver in practice than a more complex intervention would be. Service users can then choose to follow up for further information at their own choice. A direct, untargeted approach ensures all service users receive an intervention.
3	Layered intervention	A consistent message delivered across primary care and followed up with signposting to appropriate services and the provision of tailored advice and support to help specific service users (who show interest in the intervention) to reduce SHSe levels for others at home.
4	Intervention targeted to population groups	Harm reduction messages should only be delivered to particular populations (those in areas of high smoking prevalence, to parents, to

		identified smokers, to those presenting with a complaint relevant to smoking or SHSe).
5	Patient-specific intervention	A complex intervention should be delivered in-person, which is specific to the patient to best support them to reduce SHSe for non-smokers in the home.

Each of the suggested intervention vignettes addresses the capability, opportunity and motivation-related findings of HCPs in primary care settings as presented in this chapter. Suggested vignettes 1-4 involve the delivery of a brief, impersonalised intervention to service users by all HCPs working in primary care settings. This is aligned to the expressed viewpoint that all primary care-based HCPs are responsible for intervening around SHSe and have the capability to distribute informative leaflets and signpost service users for further information or assistance (section 5.3.3.1). Vignette 5 requires HCPs to have a deeper understanding of the topic of SHSe and harm reduction strategies and thus would require training provision for HCPs involved as has been highlighted as a need in the capability findings (sections 5.3.3.2 and 5.3.3.3). With respect to the opportunity findings, the brevity of vignettes 1, 2 and 4 takes into consideration the highlighted lack of resources (namely, time) that are outlined in section 5.3.4.2. Vignette 3, requiring follow-up for individualised support and vignette 5 involving the delivery of a complex and patient-specific intervention would both require time and funding. However, these vignettes would use the identified opportunities of particular HCP types who can have longer consultations on SHS-related topics and whose working environments may make the topic easier to address (sections 5.3.4.3 and 5.3.4.4). Similarly, vignettes 1-4 avoid the consequence of 'guilt' as described in section 5.3.5.1 being (initially) impersonalised intervention strategies. The patient-

professional relationship (section 5.3.5.2) is likely to be unaffected by intervention delivery due to this impersonal design. This aligns to the motivation expressed by some HCPs to avoid damaging their relationship with patients and also aligns to the service users' motivating factor of engagement and trust, given the viewpoint of some that HCPs use smoking as a scare-tactic to instil guilt unnecessarily. As vignettes 3 and 5 involve the delivery of follow-up tailored interventions, they both address the theme of appropriateness. HCPs involved in delivering vignettes 3 and 5 will not experience the demotivation identified when HCPs are unable to offer follow-up advice and support.

5.4. Summary

The findings of this qualitative study have built upon the findings of the previous chapters to explore the capability, opportunity and motivation of HCPs to deliver a SHSe intervention in primary care settings. This exploration has included the perspectives of HCPs (with different characteristics) and appropriate service users. Suggestions for future intervention directions have been proposed from the perspectives of both HCPs and service users and have been discussed in this chapter.

Thesis objectives A, B, C and D were addressed through the findings of this qualitative study. The findings build upon the earlier study findings presented in chapter 3 and 4 of this thesis. Furthermore, these qualitative findings contribute to the mixed-methods integrated synthesis presented in next thesis chapter (Chapter 6) and also in the thesis Discussion (Chapter 7) to answer the overarching thesis aim and objectives.

CHAPTER 6:

MIXED-METHODS INTEGRATED SYNTHESIS OF PRIMARY RESEARCH FINDINGS

This penultimate chapter presents a mixed-methods integrated synthesis of the primary research study results which have been individually presented in Chapter 4 (DeSSHaRM study) and Chapter 5 (DeSSIP study). This synthesis has followed rigorous methods (Section 6.2) to draw on the findings of both studies in answer to the overall PhD thesis's aim and objectives as defined in Chapter 1 (Background). As detailed in Chapter 2 (methodology) such use of this mixed-methods integration step strengthens the conclusions drawn (see Chapter 2 Methodology). Rather than offering independent conclusions concerning each of the objectives as developed through the quantitative and qualitative datasets alone, the integrated synthesis allows comparison of these data findings; thereby offering a more complete and in-depth understanding of each of the thesis objectives. Thus, the integration of the survey and interview data collected from HCPs (as presented individually in chapters 4 and 5) are herein presented and synthesised. Discussion of the service user voice (which was explored in the DeSSIP study) is then used to supplement the discussion of these mixed-methods findings in the next and final thesis chapter (Chapter 7 Discussion).

6.1 Background

6.1.1 Aim

To conduct a mixed-methods synthesis integrating the qualitative and quantitative data from the DeSSHaRM and DeSSIP studies, in order to allow for comparison of results and to enhance the understanding that can be interpreted from either of the study results alone.

6.1.2 Objectives

1. To triangulate data on HCPs' capability, opportunity and motivation to provide SHSe harm reduction interventions in primary care settings.
2. To comment on the level of convergence or divergence of the two data sets.

6.2 Methods

A convergent design[142] was adopted for the conduct of this mixed-methods synthesis (Figure 6.1). The mixed-methods data were collected from the same populations concurrently and independently in order to answer parallel research questions.

As explained in chapter 2, the convergent method[142] of data triangulation and integration was identified as the most appropriate method of mixed-methods synthesis for this research: encompassing integration of the two separate data sets in the final stage of the overall project when the results were being interpreted in order to answer the overarching PhD aim and objectives. As per the convergent design, the data were collected and analysed before being integrated. An adapted Framework method[234] of data analysis was used to integrate the two datasets as outlined in Figure 6.2. As part of this process, a qualitizing method[235] of converting the quantitative data into categories and narratives was used for the data transformation step, which enabled the integration of the two datasets. The integrated data were then interpreted, and the findings of the synthesis are presented below (Section 6.3). Additionally, a mixed-methods joint display[236] is presented across Figures 6.3, 6.4, and 6.5 to summarise the process of merging and interpreting the two individual datasets to build up the narrative discussion of the integrated synthesis as presented in Section

6.3. In this way, this chapter meets the recommendations for integrated mixed-methods syntheses which should "include both qualitative and quantitative data and interpretations and highlight the mixed methods interpretations as confirmed, divergent, or expanded in these displays."[236]

In this mixed-methods synthesis, only the influence of the type of HCP was explored for the potential effect on the C, O, M results drawn from quantitative and qualitative data. It is unlikely that any future intervention would target HCPs of a certain number of years of experience or of a particular gender to deliver SHS harm reduction intervention in practice. Thus, these options were not integrated and explored in the mixed-methods synthesis.

The two datasets were regarded to be of equal importance in their contribution[237] to the thesis conclusions. Therefore, both were weighted equally in this mixed-methods synthesis and were used to draw conclusions on whether there was confirmation, divergence or expansion[236] in the findings. This synthesis informed a statement on whether the two datasets were convergent or divergent.

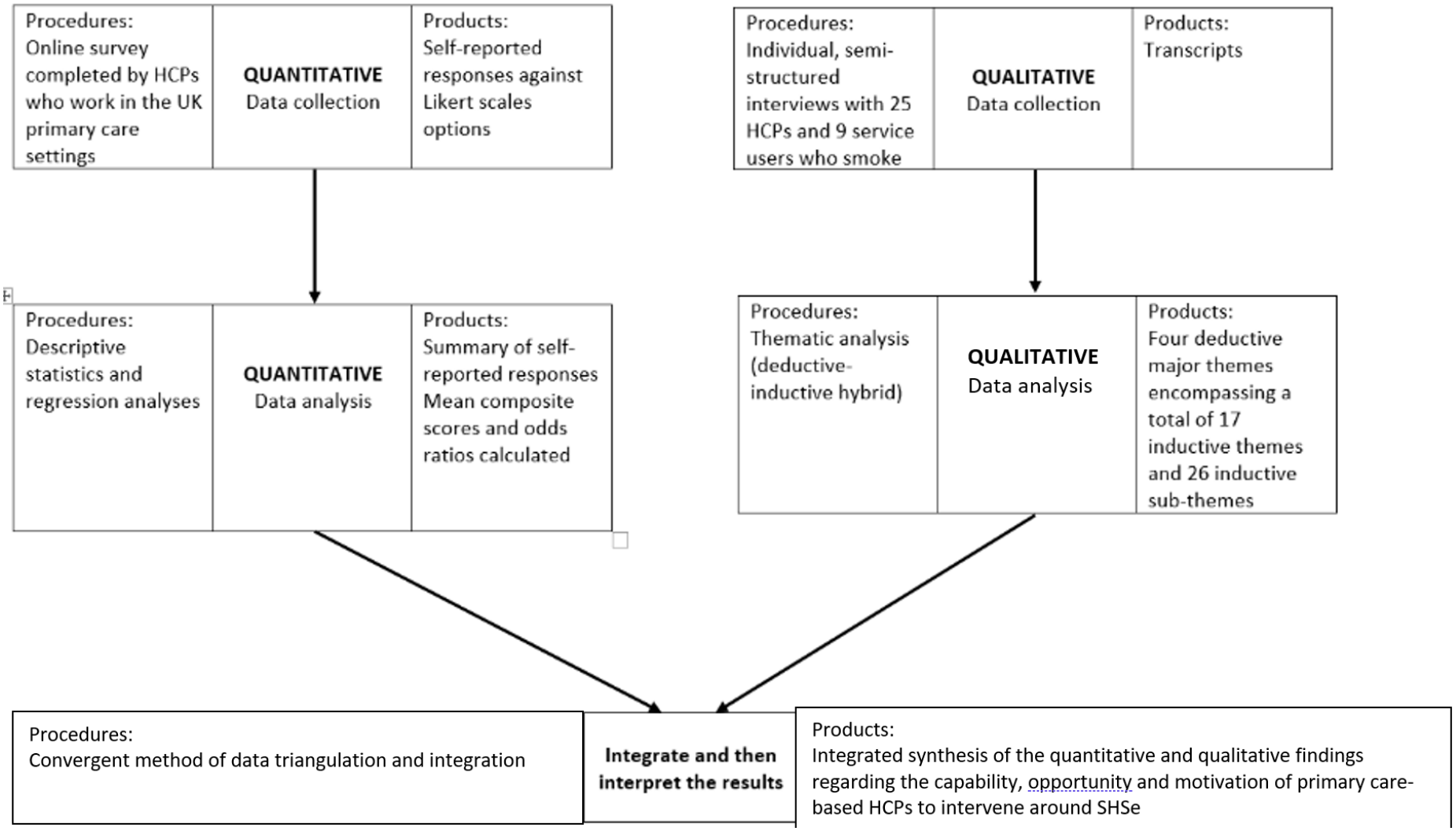
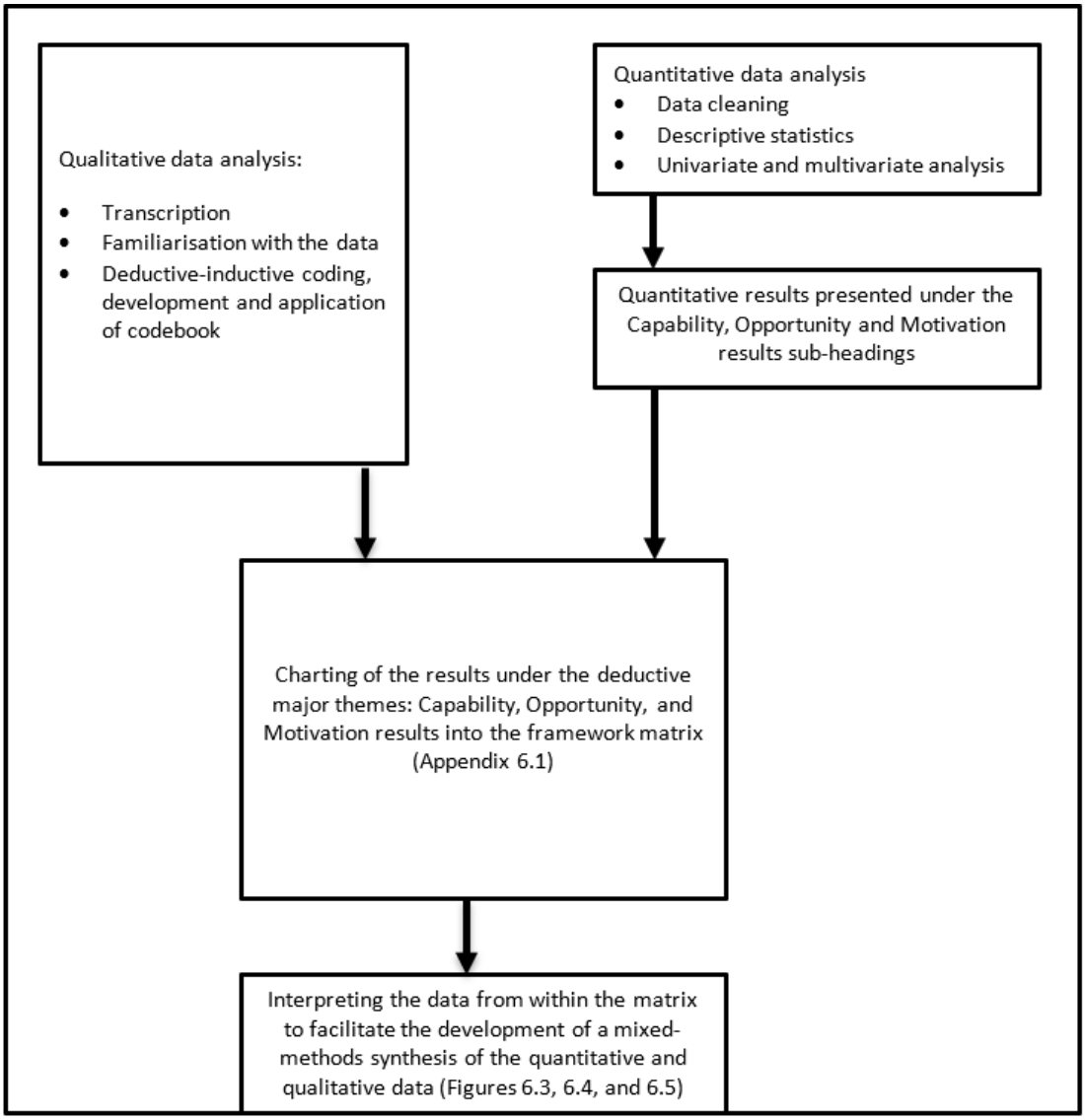


Figure 6.1 Outline of convergent design used in mixed-methods integrated synthesis

Figure 6.2 Outline of steps used to integrate the two data sets as adapted from the Framework method of data analysis.[234]



6.3 Integrated synthesis findings

6.3.1 Capability

Both studies indicated that primary care-based HCPs had some, albeit limited, capability to intervene around SHSe in practice. The studies showed that HCPs generally had a good awareness of SHSe and its associated effects on health for exposed non-smokers. However, there was confusion around the differences between SHS and thirdhand smoke. Previous public health campaigns, in addition to legislation changes, were common sources of information and reminders of the harms attributed to SHSe for many HCPs, who often received very little training in their professional education on the topic. Most had never encountered the concept of SHSe harm reduction, although some were able to infer what a harm reduction approach would aim to achieve. Thus, HCPs generally felt they had some level of capability to intervene around SHSe based on their awareness of the topic and generic job-specific training (e.g. motivational interviewing skills). Often, HCPs thought about and subsequently recommended cessation to achieve reduced harms around SHSe. Others were also aware of the importance of smoking outside of the home. HCPs highlighted the need for further training to support them to intervene around SHSe in practice and thereby, support the application of their existing knowledge into their clinical practices. The two data sets on HCPs' capability to deliver SHSe interventions in primary care settings converged, confirmed and complemented one another.

6.3.2 Opportunity

Both studies indicated a low level of opportunity for intervention delivery. More barriers to opportunity were identified than facilitators in the qualitative data. A lack of time was

consistently raised as a barrier to intervention. Wider medical and social problems were perceived as a higher priority to be addressed were mentioned as additional barriers. In addition, a lack of support both in relation to resources (e.g. funding) and social encouragement (e.g. support from management or professional bodies and access to supportive services for patient referral) were also highlighted as barriers to intervention opportunity. Improving the social opportunities (e.g. through incentives and expected campaign promotion) was suggested to improve HCPs' opportunities to deliver a SHSe intervention.

However, the studies did indicate some opportunities to intervene. HCPs were more likely to intervene around SHSe in response to a child presenting with a related medical illness or if there was an apparent related diagnosis or worsening prognosis, which could be explained by SHSe. Consultations which occurred following the development of a good relationship and rapport with service users were thought to be good opportunities to raise the topic of SHSe with patients (rather than a one-off or first consultation appointments with a service user). Nurses and health visitors were widely considered to have the most suitable opportunities for SHSe intervention delivery: self-reporting the highest scores for opportunity in the survey data and also interpreted from the perceptions of all types of HCPs in the qualitative data.

Overall, both studies' results on opportunity to deliver interventions were convergent, and the findings either confirmed or complemented each other.

6.3.3 Motivation

Both studies showed that HCPs were generally motivated to intervene around SHSe, although some perceived consequences reduced their motivation levels.

Most participants believed it important to intervene around SHSe and thus showed motivation for intervention; however, there was a large interplay between motivation, capability and opportunity. Motivation was found to be influenced and at times undermined by both capability and opportunity. The findings around motivation from both studies were mostly convergent, often complementing and confirming each other. However, two instances of divergence in the datasets were identified.

Motivation was, in most cases, mainly determined by the HCPs' view of whether it was appropriate to deliver an intervention around SHSe. Both studies found that HCPs' felt addressing SHSe was important and considered to be a part of the primary care-based HCPs' job roles. However, the topic was not considered as a high priority in comparison to other medical or social issues competing for the same time in consultations, thus reducing motivation. The qualitative data highlighted that HCPs in the UK primary care sector generally wanted to avoid eliciting a feeling of guilt amongst smokers. Some HCPs indicated in the qualitative study that they would feel uncomfortable intervening around SHSe, mainly because of the perceived sensitive nature of the topic and in a wish to avoid creating a sense of guilt for patients. The survey data, however, contradicted this finding with many of the respondents reporting they would not feel uncomfortable delivering SHSe interventions.

Both study findings agreed that HCPs would want to build, maintain and protect their patient-professional relationships. This was shown to take a higher priority than intervening

around SHSe for HCPs in both studies. Protecting this relationship was often the reason HCPs avoided making smokers feel guilty about SHSe as they wanted to avoid instigating defensive reactions from service users. HCPs' general uncertainty of how service users would react to a SHSe intervention was confirmed by the findings of both studies. There was a similar uncertainty expressed by HCPs regarding HCP uptake of intervention delivery and in view of the perceived efficacy of SHSe harm reduction interventions. The survey findings were echoed in the interview data where HCPs reported more likelihood to deliver an intervention in response to a worsening medical condition and described health promotion activities as a "luxury" activity for HCPs in primary care. Also affecting motivation to deliver an intervention was HCPs view of their self-confidence or capability to counsel patients on SHSe. The two study findings highlighted a divergence of the data sets regarding HCPs' capability-related motivation to intervene. The survey findings indicated HCPs often felt they had received sufficient training on the topic and that they had the capability to intervene. However, the qualitative data around capability and motivation showed that HCPs often did not feel confident in their own capability, thus reducing their motivated to intervene. A lack of opportunity to take action and intervene in practice also decreased HCPs' motivation to intervene.

6.3.4 Overall summary of the mixed-methods integrated synthesis

This integrative synthesis of the two datasets has allowed comparisons to be drawn and overall conclusions to be ascertained to help answer the thesis' overarching aim. Across the studies and as apparent in the mixed-methods synthesis, the lack of opportunity, both social and physical, was the main influencer of HCPs' SHSe intervention delivery practices. The lack of opportunity to deliver an intervention also decreased HCPs' motivation to intervene as a

result. This lack of opportunity and motivation also reduced HPCs' likely uptake of training opportunities, thereby not promoting the development of capability to intervene as part of clinical practice. The lack of opportunity to conduct skillset development and knowledge acquisition also reduced HCPs' capability to deliver SHS harm reduction interventions in practice. Figures 6.3, 6.4, and 6.5 show joint displays which evidence the integration of the datasets. A more detailed illustration of the combined datasets in given in Appendix 6.1.

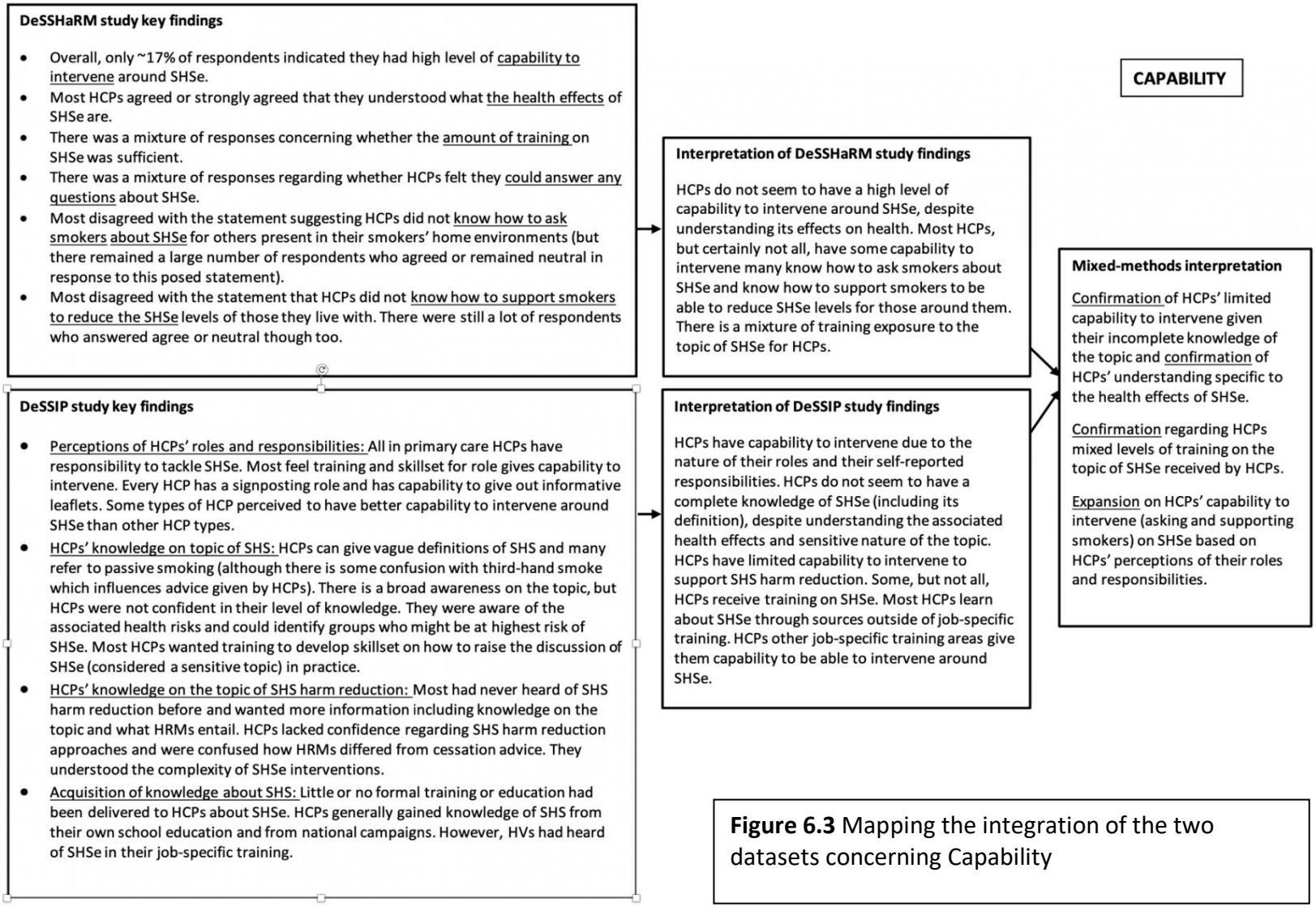


Figure 6.3 Mapping the integration of the two datasets concerning Capability

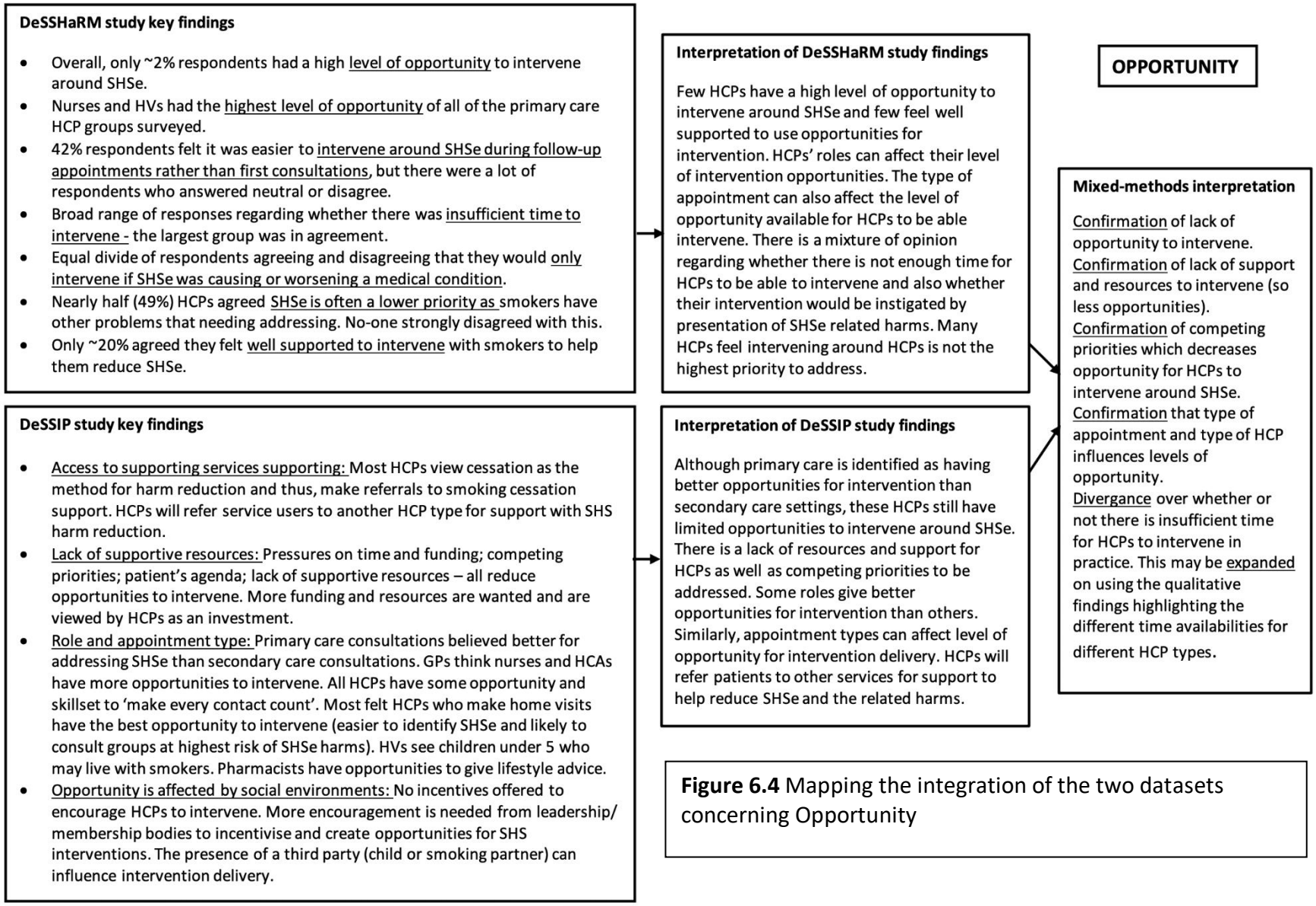


Figure 6.4 Mapping the integration of the two datasets concerning Opportunity

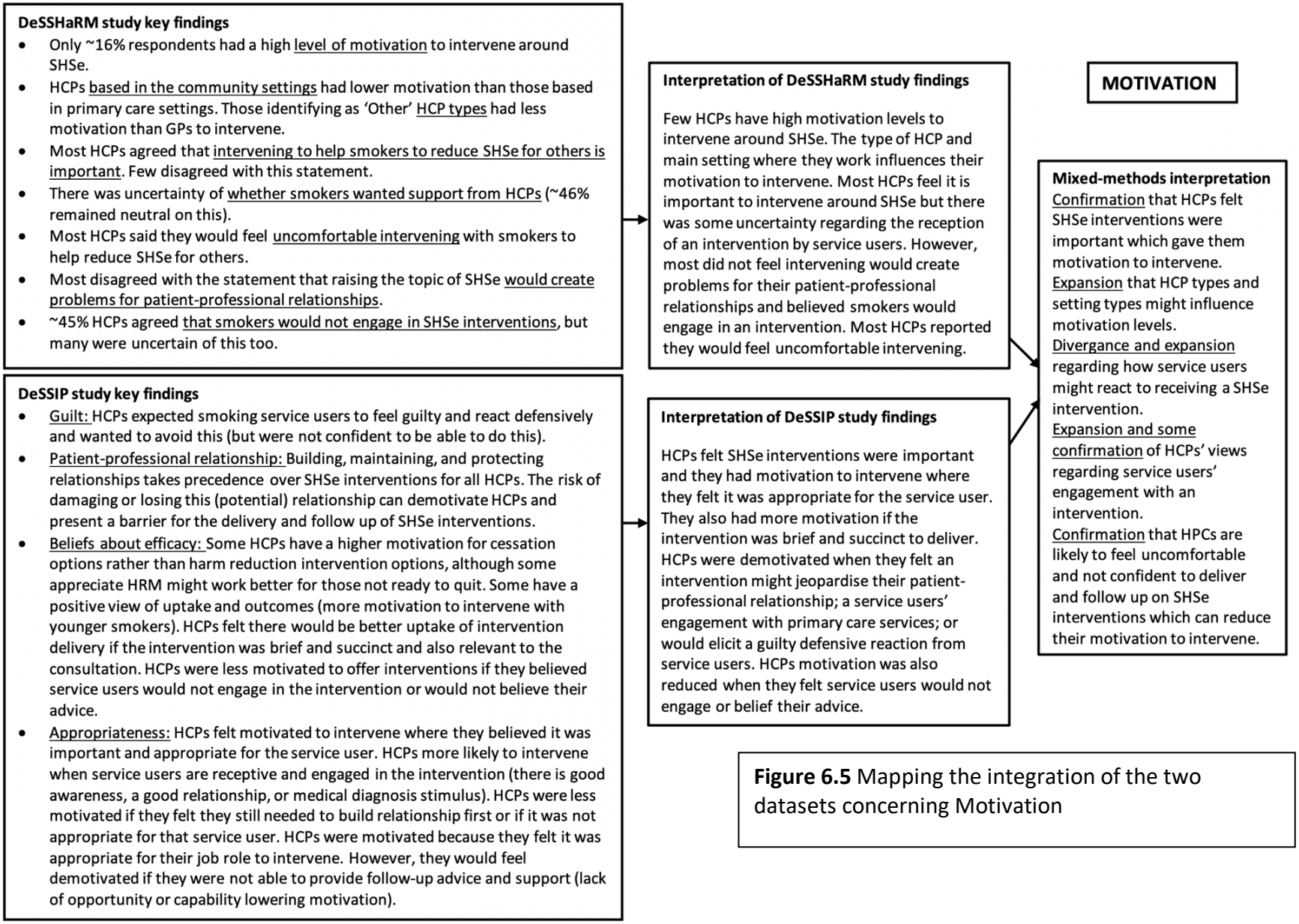


Figure 6.5 Mapping the integration of the two datasets concerning Motivation

CHAPTER 7:

DISCUSSION

7.1 Introduction to chapter

Chapter 7 concludes this thesis by summarising the: key findings from the empirical research undertaken throughout the thesis in relation to the aims and objectives of set out in chapter 1, contextualising how these findings fit in with the wider literature, describing the strengths and limitations of the overall methodological approaches taken followed by recommendations for policy, practice and future research. Lastly, the end of the chapters states the overarching thesis conclusion.

7.2 Key findings of this thesis

This thesis aimed to explore the current and potential use of UK primary care settings for the delivery of SHS harm reduction interventions, in cases where smoking cessation was not a viable option.

The following four objectives were defined to achieve this research aim:

A. To ascertain the level of, and perceptions of, primary care-based HCPs' knowledge and skillset regarding SHSe interventions
B. To identify the current practices of HCPs working in primary care settings, in relation to SHSe

C. To explore beliefs, experiences and influencing factors which affect the current and potential delivery (and/or receipt) of SHS harm reduction interventions in primary care settings, from the perspectives of HCPs and service users
D. To identify approaches that UK healthcare professionals in primary care can use to deliver SHS harm reduction interventions.

A systematic review, two primary research studies and subsequent mixed methods synthesis combining findings taken from the primary research studies (chapters 3-6) were conducted in order to achieve these objectives. The findings of each of these chapters have contributed to the overall key findings of the thesis, which are presented against the thesis objectives in this section (7.2).

7.2.1 Primary care-based HCPs' knowledge and skillset regarding SHSe interventions

All three empirical research studies (chapters 3-5) evidenced HCPs' knowledge and understanding of the harms and consequences associated with SHSe for non-smokers. Additionally, HCPs consistently showed an awareness of the important need for interventions to reduce SHSe. However, some discrepancy arose concerning HCPs' knowledge of what SHSe was. Although most surveyed HCPs reported that they did understand what SHSe was, the qualitative data indicated there was confusion with thirdhand smoke; subsequently confusing the recommendations HCPs offered to help smokers in order to reduce others' SHS exposure.

Concerns were also raised around the availability of, and amount of training received by primary care-based HCPs on the topic of SHSe. Despite the consistent finding of a lack of training across all three studies, the qualitative results indicated that Health Visitors (HVs)

did receive some training (more than other HCP groups who often had no formal training) around SHSe identification and management. The general skillsets of all HCPs were considered useful to apply to SHSe interventions, despite the need for SHSe-specific training.

7.2.2 Current practices of primary care-based HCPs relating to SHSe

It was clear that few HCPs based in UK primary care settings would address SHSe as part of their routine clinical practice. A limited number of the HCP participants reported or described any processes around asking or advising about SHSe and fewer yet reported any proactive measures to promote SHS harm reduction. The survey responses also demonstrated few examples of 'good' practice by HCPs relating to SHSe intervention. This should be considered in light of the survey (chapter 4) highlighting a lack of any current practice at all in relation to managing SHSe. Most respondents reported they 'rarely' practised asked, advised or acted at all about SHSe.

The findings of the systematic review (chapter 3) demonstrated global generalisability to the UK findings, evidencing a lack of clinical practice concerning management of SHSe by primary care-based HCPs. However, in the global literature, HCPs were typically seen to ask about SHSe, and provide SHSe-related advice, more than they would demonstrate practical actions to support reductions in SHSe which was in contrary to our survey findings (chapter 4).

7.2.3 Beliefs, experiences and influencing factors affecting the delivery of SHSe interventions in primary care settings

<u>Beliefs and experiences concerning SHSe interventions</u>

Throughout the interviews and surveys there was clear evidence that HCPs felt SHSe harm reduction was considered to be an important intervention to be delivered in UK primary care. However, many of these HCPs felt that SHSe-related interventions may be considered a "luxury" topic to address beyond their routine clinical work, due to the wider barriers of time and resource availability. Some HCPs also felt that smokers would not receive interventions well and would be unlikely to engage in such an intervention if it was offered.

The systematic review findings echoed these beliefs and experiences. Existing literature confirmed the belief that it was the role of HCPs to intervene around SHSe. Additionally, the literature highlighted the belief of importance to intervene, which could be superseded by wider or competing priorities (e.g. presenting medical complaints).

Facilitators and barriers to intervention

There were few facilitators identified across all three studies regarding the delivery of SHSe interventions in primary care settings. Some of the examples of facilitators which encouraged discussion and intervention referrals of SHSe included: good patient-HCP relationships and relevant/worsening medical diagnoses associated with SHSe.

On the other hand, this thesis identified numerous barriers to successful implementation and delivery of SHSe specific interventions. Examples of barriers related to limitations in: training around SHSe (particularly relating to the skillset required to intervene), time during the HCPs routine clinical workload, encouragement to intervene as part of usual clinical practice and resources available to support intervention delivery. Additionally, HCPs were concerned that discussions around SHSe and smoking would damage the rapport and relationship they have built with patients and their families.

7.2.4 Future approaches to interventions

The qualitative study findings contributed to recommendations for future SHSe interventions as given from the perspectives of HCPs and service users. A detailed summary of these have been provided in section 5.3.6. Furthermore, five vignette detailing example interventions were identified from interview participants (detailed fully in Appendix 5.17).

In summary, there appeared to be a wide range of hypothesised suitable interventions which may be appropriate to be delivered in UK primary care. A cross-cutting theme amongst them was the need for clear communication across the primary care team, and the differential role primary care HCPs could fill dependent on their job skillset.

There was an appreciation for a variety of approaches to deliver the SHS harm reduction messages; for example, both planned and opportunistic methods were thought to be applicable. The suggested modes of delivery ranged from unspecific, quick and easy messaging (e.g. leaflets and posters to be seen by all patients) to patient-specific, complex and time-demanding interventions (e.g. personalised support with progress followed up in subsequent consultations).

These different approaches were thought to achieve the specific beneficial aims of SHSe interventions, which moved through: raising awareness of the issue with both HCPs and patients; gaining and then maintaining patients' trust; getting patients ready to make changes to their smoking behaviours; signposting patients to sources of individual support; and then offering support and follow up support to achieve SHSe reductions.

Ultimately, HCPs wanted an intervention which would be feasible to deliver and effective to reduce levels of SHS thereby, protecting non-smokers from harm.

Many HCPs recommended that any future SHSe intervention should be kept very brief. It was suggested that the intervention should be of similar format to the existing smoking cessation VBA and be delivered within 30 seconds at the end of the cessation VBA.

The five vignettes incorporated all of these elements and exemplified how these intervention characteristics could fit together. These vignettes included: an indirect, broad, untargeted approach; a direct, brief, untargeted approach; an intervention targeted to specific target population group. a layered intervention; and a patient-specific intervention.

7.3 Findings in relation to existing literature.

As discussed in chapter 1 (Background) there are advantages of primary care settings and services which lend themselves well to be used in the delivery of SHSe interventions. Despite the appropriateness of the setting, no previous research has definitively explored the possibility and potential use of primary care in SHSe intervention delivery. It is therefore difficult to directly compare the thesis findings to existing literature. However, it is still possible to examine how the thesis findings sit in context with wider literature concerning health service delivery, healthcare education and intervention implementation research.

7.3.1 Primary care-based HCPs' knowledge and skillset regarding SHSe interventions

Healthcare professionals working in primary care settings are required to have the appropriate knowledge and skills to be competent in their role. This is primarily attained in their job-specific undergraduate degree (or equivalent) and is further developed during

postgraduate activities as they progress through their career. Continuous professional development, additional bespoke training courses and/or post-graduate degrees are typically used as sources for attaining further knowledge and skills beyond their initial basic training.

Training opportunities have been utilised in research to enhance HCPs' development of specific skillsets in the remit of public health initiatives or better clinical management.[238–240] Methods used to deliver training are variable including a mixture of face-to-face approaches,[238,241] or digital approaches such as E-learning packages[242] or chatbots.[243] A Cochrane review highlighted that those who were trained in smoking cessation were more likely to perform tasks of smoking cessation than untrained controls.[244]

The thesis findings indicated that there were little training opportunities available to HCPs concerning SHSe. However, an example of the successful use of an online package has been evidenced in the wider literature.[187] In this case, a 30 minute online training module was made freely available to all HCPs to help them to raise the issue of SHS during clinical encounters and to promote actions which would reduce SHSe in home and car environments.[187] An evaluation of this online training package showed participants' knowledge and confidence to intervene around SHSe increased following undertaking the training.[245] Furthermore, this increased knowledge and confidence to intervene, a finding which was maintained 3 months after the training had been delivered.[245] This is largely in line with research in the field where improving training in the field improves HCPs desire to perform tasks facilitating intervention.[246]

Of note during the qualitative study discussed in chapter 5 there was no mention of the existing online SHSe training package by HCPs, suggesting limited awareness of use of the software. Instead of highlighting existing software, the participants in this thesis consistently reported an overall lack of SHSe specific (although had highlighted general smoking-cessation training packages) training availability and access. This suggests that either the existing approaches have a low uptake or limitations in their delivery which need to be explored further.

Where participants did not have sufficient training themselves, the qualitative study in chapter 5 highlighted how HCPs applied their existing knowledge and training around smoking cessation to the questions concerning SHSe and related interventions. This is consistent with the anchoring effect, a cognitive bias where clinical decision making is heavily influenced by the HCP's existing knowledge base.[247,248] By having, a firm knowledge base in a specific area, rationale logic can be extrapolated to other similar clinical areas using this process.

Where limitations in knowledge exist, system wide approaches in primary care have been successfully adopted in particular clinical areas. Examples of such methods include (and are not limited to) the use of incentivisation, campaigns, organisational training.[78,249] These examples were all mentioned as options by HCPs interviewed as part of this thesis as means to improve HCPs' levels of opportunity to intervene around SHSe by first increasing knowledge and skills. It was widely recognised that increased knowledge and skillset would in turn improve and support clinical practice in this area.

7.3.2 Current practices of primary care-based HCPs relating to SHSe

The harms associated with SHSe have been consistently well evidenced as described in Chapter 1 (Background). Despite the known consequences and the subsequent presentation of medical complications in primary care settings, the thesis has evidenced few examples of SHSe-related clinical practices. The limited practice demonstrated by the surveyed and interviewed HCPs (chapters 4 and 5) was also confirmed at a global level by the systematic review (Chapter 2).

The thesis's quantitative study found that where practices did occur, HCPs more often reported acting in relation to SHSe in comparison to asking or advising about SHSe. This finding contradicted the existing literature findings, as had been synthesised in the systematic review, where HCPs asked more than they did advise, which in turn was more common than acting around SHSe in clinical practices. This discrepancy between the global literature findings and the survey results may be as a result of social desirability bias.[250] The surveyed HCPs may have reported acting more than they did in practice, if they believed that this was the correct action to take (the survey findings also indicated that the same HCPs who suggested the need for action felt it was important and key to their role to intervene around SHSe).

Alternatively, the unexpected increased actions in comparison to asking practices may be a reflection of HCPs' professional decision making in practice. In the limited time available for primary care consultations, it may be that where SHSe is an apparent problem HCPs would indeed act. However, these HCPs may not be inclined to ask all of their patients about SHSe to identify harmful exposure which may or may not be related to the presenting complaint

or the focal point of the consultation. A similar scenario is often observed with regards to identifying or acting around substance misuse.[251] HCPs due to barriers such as time pressure may not ask all service users for their history of substance misuse, unless it was considered relevant to the consultation and they had suitable treatment options.[252] However, the majority of HCPs would give advice or take action to support service users where substance misuse had already been identified as a problem and do believe it is integral to their role.[252]

In summary it is clear clinical practices that are displayed by primary care HCPs are heavily influenced by the HCPs' beliefs about professional expectations and previous clinical experiences. The delivery of SHSe interventions in practice will ultimately be influenced by many facilitators and barriers.

7.3.3 Beliefs, experiences and influencing factors affecting the delivery of SHSe interventions in primary care settings

The thesis highlighted many factors which influenced the delivery of SHSe interventions by primary care-based HCPs. The contextualisation of these findings has been presented in four distinct categories: patient-related factors, HCP-related factors and organisation-related factors.

Patient-related factors

As seen in the thesis service users had pre-existing conceptions where they believed HCPs had good level of knowledge on the topic of SHSe, which they believed enabled HCPs to be able to deliver SHSe interventions. This finding is aligned to the wider literature which

echoes service users' belief in the knowledge and intervention capability of HCPs believing they are experts in their roles hence trusting their decisions.[253]

However, the service users included in this thesis' research indicated that despite having trust in HCPs' knowledge, they did not always trust HCPs' intentions when they offered SHSe interventions. Some service users believed HCPs were simply trying to scare them or make them feel guilty for their smoking behaviours. This distrust of HCPs' intentions when offering supportive interventions is also seen in smoking cessation literature.[254] Similarly, service users who are encouraged to breastfeed their infants have also reported being made to feel guilty by HCPs who deliver an intervention concerning infant feeding.[255]

The service users' sense of guilt also translated to the reception of interventions as evidenced in this thesis. As echoed by existing literature, when a third party was present in a consultation, service users were less receptive and less likely to engage in an intervention concerning sensitive health promotion issues, such as smoking or alcohol consumption.[256]

Additional patient-related facilitators and barriers to intervention delivery in primary care settings include: HCPs' level of understanding of the service users' perspective, strength of the relationship with the HCP, whether the intervention would have undesired consequences.[257]

<u>HCP-related factors:</u>

As identified in this thesis, HCPs were consistent in their belief that it was their role to intervene around SHSe and that it was important to do so. The facilitating belief of role and

importance to intervene has been evidenced in relation other sensitive health promotion activities such as prevention of obesity.[258,259]

A second belief which was evidenced in this thesis to influence HCPs' SHSe intervention delivery behaviours pertained to the patient-professional relationship. HCPs were reluctant to deliver an intervention if they felt it would damage their relationship with the service user. A similar view also inhibits the delivery of intervention in relation other stigmatised topics, such as mental health problems or substance misuse, and also to sensitive issues, such as experience of domestic violence. However, the wider literature would indicate there is a possibility for maximising the authority, trust and confidence associated with HCPs roles to empower HCPs to be well suited to intervene regarding stigmatised or sensitive issues.[260]

The experience of competing priorities was highlighted in this thesis and indeed is a poignant influencing factor to the delivery of many interventions in primary care settings.[261] The majority of HCPs are limited in their time to complete all of their workload and many are forced to prioritise which issues they address.[249,262] General practitioners have restricted consultation times with service users and additional HCP types have been introduced to support their role and help meet the demands of primary care services.[263] Additionally, HCPs in primary care are required to prioritise the points they address in each consultation to best manage clinical cases.[260] Where there are competing medical needs to be addressed, not all interventions (including SHSe which is arguably often a matter of prevention rather than cure) can be raised.[249]

Additional HCP-related facilitators and barriers to intervention delivery have been identified in the existing literature which build on those that were identified in this thesis. These

include: tensions between medical and social explanatory models,[260] unspoken assumptions about agency,[260] the healing power of human connection,[260] self-confidence in counselling skills, knowledge and experience levels,[257] and attitudes held towards the importance of intervention.[257]

Organisation-related factors

The environmental settings where primary care consultations take place each have unique qualities which may facilitate or impede successful intervention delivery. Consultations conducted in service users' own homes create opportunities for HCPs to identify potential environmental harms, such as SHSe. Similarly, elderly or childhood neglect may also be identified during home visits, giving HCPs an opportunity to intervene.[264] On the other hand, clinic visits offer private, confidential spaces where SHSe interventions can be delivered. In this way, the use of consultation rooms in community pharmacies aids the delivery of interventions to service users, including those relating to lifestyle advice or smoking cessation.[265] Both home visits and consultation/ clinic rooms lend themselves well to the delivery of SHSe interventions.

The thesis findings highlighted another organisational factor which influenced the delivery of SHSe interventions – a lack of resources. Interviews with HCPs explained the lack of funding and loss of specialist staff. The funding previously available to support the provision of nicotine replacement therapies (NRT) has been withdrawn.[266] Therefore, support for SHSe harm reduction which utilises NRT are no longer free of charge for service users. There has been a loss of funding for specialist smoking cessation services in the UK. Thus, services which had previously been available to offer individualised follow up support for smokers

have been discontinued throughout the majority of the UK. This is compounded by an overall shortfall of staffing in UK primary care settings overall.[267] A shortfall which further exacerbates limitations on time available per consultation thereby restricting opportunities for SHSe intervention delivery in primary care settings.

Other organisational factors which may influence interventions (in addition to those identified in the thesis findings) include: ineffective interventions, level of assistance/support available in intervention delivery, reimbursement, IT support, length of consultation times, referral pathways, and communication with other members of the HCP team. It is possible that these additional factors may also influence SHSe intervention in primary care settings.[257]

7.3.4 Future approaches to interventions

The thesis identified that there is a lack of awareness of existing e-learning software suitable for improving knowledge surrounding SHSe from HCPs. Despite the limited awareness of existing solutions, HCPs participating in the thesis' research had offered insight into possible suitable interventions to target SHSe. These suggestions had broadly been one of two types, either population based or targeted approaches. These two mechanisms for change have underpinned public health policy, and were originally described by Geoffrey Rose in the 1980s.[268] The principle of population based approaches is that risk factors for diseases such as SHSe is normally distributed across the population and so any universal shift as a result of a widespread intervention would lead to a greater effect on overall health.[48] An example of the efficacy of this approach was the introduction of smoke free legislation which played an important role in reducing rates in smoking across England.[269] Although, not on such a macro

scale, HCPs in this thesis advocated non-targeted approaches where patients could universally be screened for SHSe. However, population based approaches may encounter the 'prevention paradox' whereby successful reductions in the total population's exposure to a risk factor may be reduced but this would only confer as a small benefit to each at risk individual.[48] Therefore, alternative approaches may be suitable which are targeted as suggested by some of the HCPs involved in this thesis. Targeted approaches in smoking cessation have proven to be successful. For example, a randomised controlled trial examining the use of financial incentives targeted at pregnant women as a tool for smoking cessation appeared to be hugely successful in discontinuing smoking.[270]

Therefore, it does seem important that both population based and targeted approaches are considered in the design of future interventions in preventing SHSe. Additionally, it was clear amongst participants and the systematic review of literature that multi-factorial interventions (those with more than one intervention element e.g. counselling in conjunction with educational support) are a desired approach for future interventions. This is not surprising, as in many complex clinical issues, multi-factorial solutions have often been the most successful in improving health, such as those seen in reducing falls in the elderly or improving weight management in children.[271,272] Managing SHSe is complex, and therefore multi-factorial approaches are likely to produce the greatest benefit in those at risk.

In alignment with national guidance, smoking cessation options should always be explored as the first-line option to reducing SHSe-related harms. Therefore, it appears likely that any future SHSe harm reduction intervention should follow on from an initial smoking cessation intervention attempt. Already in existence are: training, recommended VBA strategies and

organisational promotion techniques (namely QOF and electronic system prompts) to encourage HCPs to deliver interventions promoting smoking cessation. Future SHSe harm reduction interventions may then be implemented should the smoking cessation interventions be unsuccessful to promote harm reduction until cessation can be achieved. Thus, any SHSe harm reduction messages offering alternative strategies other than quitting smoking, should not be delivered in isolation; rather it should only be delivered in instances where smoking cessation has first been ruled out.

7.4 Strengths and limitations

This thesis has many strengths and has utilised methods well-suited to achieving its aim as detailed in chapter 2. It offers robust research following rigorous and previously published methods. The same research objectives have been explored using different datasets to generate mostly consistent findings, indicating validity through triangulation. However, as for all research projects, there are also limitations which are important to recognise when considering the overall findings of the research.

7.4.1 Limitations across the thesis

The voice of the service user

Across all of the research embedded in this thesis, there has been an overall lack of service users' voice. The systematic review only included studies published from a HCPs' perspective and the survey was distributed to and completed by HCPs. Only the qualitative research study attempted to represent the voice of the service user. Nonetheless, had more service

users been recruited the qualitative findings may have been improved in the representation of the service user voice.

Theoretical grounding

The choice of theoretical grounding may be disputed as other alternatives were also available. The predecessor to the COM-B model of behaviour change, the TDF, could have been chosen for the theoretical grounding of the research instead. However, the TDF was considered not to be suitable to guide the development of interview/discussions guides for this research project. Using the TDF would offer more structure than was necessary and there was a risk that the interview would be delivered as a verbal questionnaire rather than a participant-focussed discussion. Furthermore, as all of the fourteen TDF domains could be categorised into the three COM-B components, the COM-B Model would still cover all of the relevant areas for discussion in the interview without forcing some subjects to be discussed unnecessarily. Using the TDF for the survey element of this research project was a possibility. However, this would have considerably lengthened the survey to ensure that all 14 domains were covered, which may have reduced response rates and increased respondent fatigue.

Reflexivity

Reflexivity has played a key role in all of the research studies in this thesis. My background as a pharmacist with childhood exposure to SHS is likely to have influenced my question development and interpretation of the results for each step of the thesis. Although I am a registered HCP, during the conduct of this research project I assumed the primary role of a postgraduate researcher. Therefore, it was important that I remained reflexive and aware of

the potential for personal and professional bias which could have come from my previous experiences. I recognise that it is not possible to completely avoid personal and professional biases from influencing how I collected and interpreted these data. In order to reduce the risk of inputting my bias, I adopted a non-judgemental neutral position during data collection, ensured lines of questioning remained on track with the pre-determined semi-structured interview topic guide and ensured that data analysis was conducted in conjunction and verified by other researchers, my supervision team.

Despite working as a postgraduate researcher, in reality my experience as a pharmacist also acted as a strength in this research design as it allowed me to rapidly build rapport with a range of HCPs and service users. I was able to use my professional experience to increase my understanding of the participants' viewpoint and to help probe further on certain points for clarity and more information as I would do during discussions with patients as a pharmacist. I was keen not to make participants feel pressured to answer questions "correctly". I wanted them to feel at ease sharing their honest opinions and truthful experiences. Therefore, I chose to refrain (unless, of course, it seemed rude or counter-productive to do so) from interjecting with names of medication and I made an effort to ask participants to provide clarification on topics that were referenced but not necessarily explained. This was personally challenging, particularly when I interviewed HCPs, as I felt this would seemingly undermine my competence as a pharmacist as viewed by the interviewee. However, I continually reminded myself that I had assumed the role of a postgraduate researcher as opposed to a pharmacist to help support my research practice.

To aid the recruitment of service users who were seemingly distrustful or intimidated, I explained my background as a pharmacist. I hoped that talking to a pharmacist would feel more familiar to them than talking to a researcher. For all of the interviews, the atmosphere of an informal conversation was created to encourage the participants to be honest about their experiences and opinions. I was able to use my existing consultation skills to encourage the participants to share their personal accounts and to help tailor the follow-up questions to their personal experiences. Moreover, my experience as a pharmacist gave me an interest in the application of research to inform better clinical practice and to best support service users' needs. Therefore, my professional background influenced my decision to take a pragmatic approach to this project.

7.4.2 Limitations specific to the empirical research

There were three key limitations identified concerning the empirical research components of this thesis: bias, confounding and chance. The components of these limitations are outlined in this section.

Social desirability bias:[273] The data collected through surveys and interviews relied on HCPs and service users' self-reported experiences and practices. It is possible that respondents may have given answers which they felt were the "correct" desirable option. The use of mixed-methods attempts to mitigate this bias by allowing interrogation of the two datasets. However, it is possible for this bias to have been present in both datasets, thus affecting the overarching conclusion. The anonymity (of surveys) and confidentiality (of interviews) was designed to reassure participants, so they would give truthful answers, although this cannot be guaranteed.

Selection bias:[274] Wide-reaching recruitment methods were used for data collection. However, it is possible that the findings may be limited by the effects of selection bias nonetheless. The participants of the studies may be more interested in research influencing their decision to participate in the studies. Additionally, those recruited through social media are likely to be more vocal and proactive regarding their professional role and responsibilities and may also be more likely to have seen the study advertisements. In this way, it is possible that not all HCPs' attitudes will be reflected in the study results. For example, the survey tool was distributed via social media, professional bodies and vocation-specific events/conferences. Thus, proactive members of each of the professions who attended such events or curated a social media presence for their professional identify were likely to have seen the advertisement material through these methods of recruitment.

Non-response bias:[275] Similar to above, the wide-reaching recruitment strategy employed for both studies (survey and interview) was used to limit the effect of non-response bias on the results. However, it is unknown how many of the sample saw advertisement material and actively decided not to participate and the reasons for this decision. It is possible, that those HCPs' who were not interested in the topic of SHSe or those service users who felt uncomfortable or afraid to admit smoking in the home may not have taken part in these studies. Therefore, the findings may be limited. Of the empirical studies presented in this thesis, the DeSSHaRM study (using the survey tool) is more likely to have been affected by non-response bias. The small number of respondents in comparison to total national workforce of the primary care sector is likely to limit the findings of this study. Thus, these findings, although valuable, should be used with caution in light of this limitation and would benefit from future research in the area.

Observer bias:[276] Recruitment and data collection for the qualitative study were conducted solely by myself. Therefore, it is possible that the qualitative data was influenced by observer bias. The use of audio-recordings of the interviews attempted to mitigate this effect. Furthermore, a reflexive statement has been included in this thesis before and after the presentation of the qualitative study to maintain transparency and good reflexive practice.

Confounding:[277] Confounding had the potential to impact on the findings of the quantitative survey. To minimise the impact of confounding, the sub-analyses were adjusted for all of the potential confounders.

Chance:[277] Due to chance, it possible that the results of the quantitative study have an increased risk of presenting a type I error. The underpowered tests and multiple testing may be contributing to the potential impact of chance.

7.5 Recommendations for policy, practice and research

The primary care setting clearly offers a unique opportunity to introduce SHSe related interventions, and it is clear that there is a desire from HCPs and patients that this would be beneficial. However, before this can be translated into reality, this thesis has been able to provide numerous suggestions for policy, practice and future research

7.5.1 Recommendations for policy and practice

This thesis has been able to offer several important policy and practice recommendations which include:

- There is a clear need for improving training given to HCPs in primary care. Existing options are present; however, the uptake or knowledge appears to be non-existent

amongst the group who participated in this thesis. Improving training and knowledge in similar clinical areas have demonstrated positive health improvement effects and therefore should be adopted here. Improving training could occur either through 1) making HCPs more aware of existing resources and 2) introducing new training resources for HCPs working in primary care

- Additionally, numerous structural and organisational barriers have been identified through this thesis which can be addressed. It is clear that HCPs feel that SHSe is important however, lack the time and resources to engage in consultations on this matter. Policymakers should consider options which could mitigate these competing interests. For example, upskilling other members of the primary care workforce who have patient facing roles who could engage in short initiatives such as making every contact count, or VBA approaches to take the workload of those traditionally seen in clinical roles. Additionally, policymakers should consider the need for longer appointments such as double appointments conducted by clinical staff to allow time to explore and challenge pre-existing conceptions from patients regarding smoking in the household, and ultimately provide further opportunity for rapport building and referrals.

- Policy makers should also consider how SHSe interventions might tie into existing smoking cessation interventions in primary care settings, both with regards to the training of HCPs and the opportunities for intervening with smokers on the matter. SHSe-related interventions (whether brief or complex) are well suited to follow-on from smoking cessation conversations as achieving cessation would always be the first priority (and SHSe would consequently be reduced). Asking about service users'

smoking status remains a QOF incentivised measurement for primary care HCPs to conduct. Policymakers should consider the funding cuts that have been made with respect to smoking cessation services and identify interventions which may also lend themselves for use in identifying SHSe harm reduction.

7.5.2 Recommendations for further research

- This research highlights a need to explore and develop supportive intervention packages for primary care-based HCPs to use in their clinical practice to support service users to change their smoking behaviours to reduce SHSe. Further research is required to further develop intervention(s) for potential delivery in primary care settings, which could later be tested for delivery and efficacy as part of a randomised controlled trial.
- Future in-depth research should also incorporate the service users' perspectives to a larger extent regarding SHSe-practices and future interventions. This future research should explore the perceived receipt of interventions from service users during HCPs' usual clinical practices.
- Other areas for future research might encompass HCPs' own SHSe and associated health risks when conducting home visits as part of their job.
- Similarly, it may be beneficial to also examine or/and explore carers' risks of SHSe, regardless of whether they are a professional or voluntary carer.
- To complement the findings of this research further, exploration of the use of secondary care settings in the delivery of SHSe harm reduction interventions and/or the use of national public health campaigns to promote SHS harm reduction could also be beneficial.

7.6 Overarching conclusions

Overall, the body of research presented in this thesis indicates that there is the potential to use primary care settings to deliver SHS harm reduction interventions in the UK. The thesis has identified and highlighted the current lack of research around the topic of SHS harm reduction, particularly in relation to existing and potential primary care-based interventions concerned with SHSe. Despite an awareness of the detrimental health consequences of SHSe, few HCPs receive training around SHS and SHSe to support the delivery of interventions aiming to reduce SHSe and the associated harms. As evidenced in this thesis, few primary care-based HCPs incorporate SHSe harm reduction into their current practices and there is little encouragement and support available to increase such intervention delivery. HCPs are lacking in opportunity to intervene and their levels of capability and motivation to intervene are also in need of improvement. Any future primary care specific interventions would most likely take the form of very brief advice delivered consistently by all members of the primary care team and followed up with individualised advice and support for service users as deemed appropriate. Further research is required to finalise a proposed intervention which could then be tested in its delivery and efficacy as part of a randomised controlled trial to develop upon the findings of this PhD research.

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LIST OF APPENDICES

Appendix 3.1 Manuscript supplementary table 1 – Medline search strategy

Supplementary Table 1. Medline search strategy.

1+2+3+4	Medline Search Terms
Setting (1)	primary health care.mp. or Primary Health Care/, community health services.mp. or Community Health Services/, community health services.mp. or Community Health Services/, community health centers.mp. or Community Health Centers/, community health nursing.mp. or Community Health Nursing/, family practice.mp. or Family Practice/, general practice.mp. or General Practice/, p?ediatric$.mp. or Pediatrics/, (health adj1 facilit$).mp., Health Facilities/, (health adj1 service$).mp., Health Services/, (primary adj1 care).mp., (community adj1 care).mp., public health service$.mp., (health adj (centre$ or center$)).mp., (medical adj (centre$ or center$)).mp., Community Medicine/ or community medicine.mp., family medicine.mp., health?care.mp., (community health adj1 (center$ or centre$)).mp., (community health adj1 service$).mp.
Population (2)	community health worker$.mp. or Community Health Workers/, family physician$.mp. or Physicians, Family/, (health adj1 personnel).mp., Health Personnel/, nurse$.mp. or Nurses/, nurse clinician$.mp. or Nurse Clinicians/, nurse practitioner$.mp. or Nurse Practitioners/, general practitioner$.mp. or General Practitioners/, physician$.mp. or Physicians/, doctor$.mp., health trainer$.mp., physician's assistant$.mp. or Physician Assistants/, Allied Health Personnel/ or allied health professional$.mp., Nurses' Aides/ or health?care assistant$.mp., (practitioner$ or clinician$).mp.
Phenomenon of Interest (3)	tobacco smoke pollution.mp. or Tobacco Smoke Pollution/, environmental exposure.mp. or Environmental Exposure/, ((passive or involuntary or environmental) adj4 smok$).mp., second?hand smoke exposure.mp., (tobacco adj1 (smok$ or pollut$)).mp., ((maternal or paternal or parental or care?giver or guardian) adj1 smok$).mp., tobacco smoke.mp., Smoking/, smok$.mp., Tobacco/ or Tobacco Products/
Outcome (4)	delivery of health care.mp. or "Delivery of Health Care "/, (health?care adj2 delivery).mp., Practice Patterns, Physicians'/, Practice Patterns, Nurses'/, practice pattern$.mp., professional practice.mp. or Professional Practice/, clinical practice.mp., medical practice.mp., health promotion.mp. or Health Promotion/, Health Communication/, (health?care and (quality or access or evaluation)).mp., Health Knowledge, Attitudes, Practice/, (health adj1 educat$).mp., Health Education/, Health Behavior/, Patient Education as Topic/, (patient$ adj1 educat$).mp., Consumer Health Information/, Education, Professional/, personal narrative$.mp. or Personal Narratives/, perception$.mp., Perception/, Motivation/, Comprehension/, Knowledge/ or Knowledge Management/, Early Medical Intervention/, Preventive Health Services/, (prevent$ adj4 health).mp., Counseling/, counsel$.mp., "Referral and Consultation"/, Harm Reduction/, (patient$ adj2 refer$).mp., ((physician$ or clinician$ or practitioner$ or professional$ or ((health or health?care) adj personnel$) or nurse$) adj1 attitude$).mp., (nurs$ adj1 educat$).mp., early intervention.mp., (health adj2 (knowledge or attitude$ or practice$)).mp., (patient$ adj2 counsel$).mp., personal experience$.mp., (belief$ or view$ or opinion$).mp., consult$.mp., interven$.mp.

Limit	limit to (english language and humans and yr="1980 -Current")

Appendix 3.2 Manuscript supplementary table 2

Supplementary Table 2. An outline of which of the included quantitative studies contained data relating to each of the review objectives and the inductively identified sub-themes.

Review objective	Sub-theme	Study reference number																
		32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
(i) Knowledge around SHSe	Training		■			■				■								
	SHSe risks and harm reduction		■					■					■			■	■	■
(ii) Practices employed to promote the reduction of SHSe	Ask	■			■	■					■	■		■				
	Advise						■		■	■				■				
	Act	■			■									■				
(iii) Beliefs and experiences pertaining to the delivery of SHS-related interventions	Responsibility and roles	■	■				■	■									■	■
	Self-efficacy			■											■			
	Importance of intervening					■									■			
(iv) Factors seen to influence the delivery of SHS-related interventions	Facilitators	■				■	■		■									
	Barriers	■			■	■	■		■					■				■

SHS: Secondhand Smoke; SHSe: Secondhand Smoke Exposure

Appendix 3.3 – Manuscript supplementary table 3

Supplementary Table 3. Summary of characteristics of all included studies.

First author reference	Country and Year published	Study design	Participants	Response rate	Sampling methods -Random sampling -Sampling frame/ location/ geographical area -Time-frame of recruitment	Level of methodological quality
Sharifi[32]	USA 2014	Cross-sectional survey	N = 36 10 attending paediatric primary care physicians 26 resident paediatric primary care physicians	75%	-Non-random sampling -All paediatric clinicians from Boston Medical Center's Primary Care Centre -Shortly before December 2009	Moderate
		Sample of database records	N = unknown All electronic health records following well-child visits and all records of referrals made to a stop smoking service	N/A	-Non-random sampling -The records of all paediatric patients from Boston Medical Center's Primary Care Centre who attended a well-child visit -Records pulled from 3-month period (September-November 2009)	Low
Ramos[33]	Portugal 2009	Cross-sectional survey	N = 159 58 primary care physicians 101 primary care nurses	33% for physicians 52% for nurses	-Non-random sampling -All physicians and nurses from primary care centres in Porto -Time-frame of data collection unknown	High
Garg[34]	USA 2007	Cross-sectional survey	N = 226 80 paediatricians 146 family physicians	92% 90%	-Non-random sampling -Convenience sample from Pennsylvania -Data collected between 1996 and 2004	Moderate
Cabana[35]	USA 2001	Cross-sectional survey	N = 455 All primary care paediatricians	55%	-Random sampling -National sample from across USA -Data collected between March and May 2009	Moderate
Carlsson[36]	Sweden 2009	Cross-sectional survey	N = 162 nurses	82%	-Non-random sampling -Targeted 92 child healthcare centres in two south-eastern Swedish counties -Data collected in 2004	Moderate
Hutchinson[37]	Netherlands 2014	Cross-sectional survey	N = 198 60 youth healthcare physicians 138 family physicians	73% 26%	-Non-random sampling -All youth healthcare physicians and family physicians in Limburg, Netherlands -Data collected between October and November 2011	Moderate
Aydin[38]	Turkey 2012	Cross-sectional	N = 1063 All nurses and midwives from primary	58% (prior to	-Non-random sampling -Sample recruited from six major cities in Turkey	Moderate

		survey	care settings	exclusion of incomplete returned surveys)	-Data collected between January and July 2011	
Kruger[39]	USA 2012	Cross-sectional survey	N = 1454 All primary care physicians	22%	-Non-random sampling -Convenience sample of physicians who had self-selected to receive information -Dates for data collection are unknown	Moderate
Woolf[40]	USA 2001	Cross-sectional survey	N = 201 121 paediatricians 36 paediatric nurse practitioners 41 nurses 3 'other' health professional	93%	-Non-random sampling -Convenience sample of health professionals attending a general paediatric course in Boston, USA -Data collected in April 1998	Moderate
Jonsson[41]	Sweden 2012	Sample of database records	N = 424 All medical records of children (aged 6months to 16years) with a documented diagnosis of asthma/ cough/ obstructive bronchitis	N/A	-Non-random sampling -Records of paediatric patients from 14 primary healthcare centres in Stockholm, Sweden were accessed -Records with an included diagnosis between January 2007 and February 2008 were reviewed	Moderate
Martin[42]	USA 2009	Sample of database records	N = 2085 All medical records of children from a subsample of families with a mixture of smoking and non-smoking households	N/A	-Non-random sampling -Records of paediatric patients from 13 primary care practices in USA (specific regions not known) were accessed -Records were reviewed in a 14 month period (specific dates not known)	Moderate
Nicotera[43]	Italy 2006	Cross-sectional survey	N = 281 All primary care physicians	58%	-Non-random sampling -Sample recruited from population of primary care physicians in Calabria, Italy -Data collected between April and September 2004	Moderate
Perez-Stable[44]	USA 2001	Cross-sectional survey	N = 499 A mixture of paediatricians and family physicians	56%	-Random sampling -Sample taken from urban areas of California, USA -Data collection started in November 1997 and second round of data collection was started in January 1998. Data collection end dates are unknown.	Moderate
Sanborn[45]	Canada 1998	Cross-sectional	N = 214 All primary care family physicians	41%	-Non-random sampling -Sample recruited from family physicians with	Low

		survey			hospital affiliations in three areas of Ontario, Canada -Dates of data collection are unknown	
Al-Shahri[46]	Saudi Arabia 1997	Cross-sectional survey	N = 89 All male primary healthcare physicians	99%	-Stratified random sampling -Sample recruited from Riyadh, Saudi Arabia -Dates of data collection are unknown	Moderate
Gokirmak[47]	Turkey 2010	Cross-sectional survey	N = 185 All general practitioners	93%	-Non-random sampling -Sample recruited from district of Isparta, Turkey -Dates of data collection are unknown	Moderate
Bull[48]	UK 2006	Cross-sectional survey	N = 65 43 community-based health visitors 6 community-based midwives 16 GP-practice-based nurses	52%	-Non-random sampling -Sample recruited from within the East Elmbridge and Mid Surrey Primary Care Trust area of the UK -Dates of data collection are unknown	Moderate
Winickoff[49]	USA 2008	Focus groups Semi-structured	N = 64 21 clinicians 21 clinical assistants 6 practice managers 16 administrative staff	N/A	-Non-random sampling -Data collected from 8 practices in Massachusetts (within 20 mile radius of Boston) -Data collected in Spring 2004	N/A
Arborelius[50]	Sweden 1996	Individual interviews Structured	N = 15 3 district nurses 12 family nurses	N/A	-Non-random sampling -Sample recruited from child healthcare centres across four healthcare districts in Sweden -Dates of data collection are unknown	N/A
Werrett[51]	UK 2005	Individual interviews Semi-structured	N = 6 4 health visitors 2 general practitioners	N/A	-Non-random sampling -Convenience sample taken from a single large health centre in the West Midlands, UK -Data collected within the 15-month study period spanning February 2002 to April 2003	N/A

GP: General Practitioner; N: sample size; N/A: Not Applicable; UK: United Kingdom; USA: United States of America

Appendix 3.4 – Manuscript supplementary table 4

Supplementary Table 4. Assessment of quantitative study quality.

Paper reference	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
1 Was the target population clearly defined? (No=0, Yes=1)	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Study sample is representative of the target population (Non-probability sampling=0, Probability sampling=1)	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0
3 Was a response rate mentioned within the study? (answer no if <60%) (No=0, Yes=1)	1	0	1	0	1	0	0	0	1	N/A	N/A	0	0	0	1	1	0
4 Are generalisations confined to the population from which the data is drawn? (Yes=0, No=1)	0	0	1	0	1	0	1	0	0	1	0	1	0	0	0	0	0
5 Was the measurement tool used valid? (No=0, Yes=1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
6 Was the measurement tool used reliable? (No=0, Yes=1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Does the study provide estimates of the random variability in the data for the main outcomes? (e.g. confidence intervals or standard deviations) (No=0, Yes=1)	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	1
8 Are the limitations of the study considered? (e.g. response bias) (No=0, Yes=1)	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1
9 Are the limitations taken into consideration when conclusions are drawn? (e.g. response bias) (No=0, Yes=1)	0	0	1	0	0	0	0	1	1	0	1	1	0	0	0	1	0
Methodological appraisal score (%) Total score/total number of items *100	**56**	**33**	**78**	**56**	**56**	**44**	**56**	**56**	**66**	**44**	**56**	**66**	**56**	**33**	**56**	**44**	**44**
Strength Weak: 0-33.9% Moderate: 34-66.9% High: 67-100%	**M**	**L**	**H**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**L**	**M**	**M**	**M**

H: High; M: Moderate; W: Weak

Appendix 3.5 Manuscript supplementary table 5

Supplementary Table 5. Assessment of qualitative study quality.

	Winickoff[49]	**Arborelius**[50]	**Werrett**[51]
Is there a clear statement of the aims of the research?	Y	Y	Y
Is the qualitative methodology appropriate?	Y	Y	Y
Is the research design appropriate to address the aims of the research?	Y	Y	Y
Is the recruitment strategy appropriate to the aims of the research?	Y	Y	Y
Is the data collected in a way that addressed the research issue?	Y	Y	Y
Has the relationship between the researcher and participants been adequately considered?	U	U	N
Have ethical issues been taken into consideration?	U	U	Y
Is the data analysis sufficiently rigorous?	Y	N	Y
Is there a clear statement of findings?	Y	Y	Y
Comment on contextual richness of study	This study only provides one line of relevant information to be included in this review. However, the value of this piece of data for the aim of this review is high.	This data is very relevant to the review objectives.	Some of the data is very relevant to the review aim but not all. The data collected from the different samples can be distinguished allowing the useful data to be extracted separately.

N: No; U: Unclear; Y: Yes

Appendix 3.6 Completed ENTEREQ checklist

Completed ENTREQ checklist[1]

Number	Item	Guide and description	Reported on page #
1	Aim	State the research question the synthesis addresses.	5
2	Synthesis methodology	Identify the synthesis methodology or theoretical framework, which underpins the synthesis and describe the rationale for choice of methodology (*e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis*).	8
3	Approach to searching	Indicate whether the search was pre-planned (*comprehensive search strategies to seek all available studies*) or iterative (*to seek all available concepts until the theoretical saturation is achieved*).	5-6
4	Inclusion criteria	Specify the inclusion/exclusion criteria (*e.g. in terms of population, language, year limits, type of publication, study type*).	5-6
5	Data sources	Describe the information sources used (*e.g. electronic databases (MEDLINE, EMBASE, CINAHL, PsychINFO, Econlit) grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar) hand searching, reference lists*) and when the searches conducted; provide the rationale for using the data sources.	5-6
6	Electronic Search strategy	Describe the literature search (*e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, and search limits*).	5-6 (and Supplementary Table 1)
7	Study screening methods	Describe the process of study screening and sifting (*e.g. title, abstract and full text review, number of independent reviewers who screened studies*).	5-6
8	Study characteristics	Present the characteristics of the included studies (*e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions*).	8-9 (and Supplementary Table 3)
9	Study selection results	Identify the number of studies screened and provide reasons for study exclusion (*e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications to the research question and/or contribution to theory development*).	8-9 (and Figure 1)

10	Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings (*e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings*).	6-7
11	Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings (*e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope; reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting*).	6-7 (and Supplementary Tables 4 and 5)
12	Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required.	6-7
13	Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale.	8-9 (and Supplementary Tables 4 and 5)
14	Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies?	6
15	Software	State the computer software used, if any.	Not applicable
16	Number of reviewers	Identify who was involved in coding and analysis.	6-8
17	Coding	Describe the process for coding of data (*e.g. line by line coding to search for concepts*).	6-8
18	Study comparison	Describe how were comparisons made within and across studies (*e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary*).	6-8
19	Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive.	6-8
20	Quotations	Provide quotations from the primary studies to illustrate themes/constructs, and identify whether the quotations were participant quotations or the author's interpretation.	13-15 (and Table 2)
21	Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies (*e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct*).	15-18

Checklist taken from: 1. Tong A, Flemming K, McInnes E, Oliver S, Craig J. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Med Res Methodol*. 2012;12:181. doi:10.1186/1471-2288-12-181.

Appendix 3.7 Completed PRISMA checklist

Completed PRISMA checklist[1]

Section/topic	#	Checklist item	Reported on page #
Title			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
Abstract			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5
Methods			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5-6
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5-6
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	5-6 (and Supplementary Table 1)
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	6
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5-6

Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6-7 (and Supplementary Tables 4 and 5)
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	7-8
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-anaysis.	7-8
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Not applicable
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	7-8
Results			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	8 (and Figure 1)
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	8 (and Figure 1)
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see Item 12).	8-9 (and Supplementary Tables 4 and 5)
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Supplementary Table 2
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	10-15
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Not applicable
Additional analyses	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	15-18
Discussion			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	18-21

Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	20-21
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	21-22
Funding			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	36

Checklist taken from: 1. Moher D, Liberati A, Tetzlaff J, Altman DG, Altman D. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med*. 2009;6(7):e1000097. doi:10.1371/journal.pmed.1000097.

Appendix 4.1 Confirmation for renewal of the full Ethical Approval of the DeSSHaRM study

Application for Ethical Review ERN_17-0800R

Susan Cottam

Thu 22/02/2018 09:58

To: Laura Jones (Institute of Applied Health Research)

Cc: Amanda Farley (Institute of Applied Health Research) Kate Jolly (Institute of Applied Health Research) Jaidev Ghag Kaur

Dear Dr Jones

Re: "Delivering secondhand smoke harm reduction messages in primary care: a cross-sectional survey (DeSSHaRM)"
Application for Ethical Review ERN_17-0800R

Thank you for your application for renewal for the above project, which was reviewed by the Science, Technology, Engineering and Mathematics Ethical Review Committee.

On behalf of the Committee, I confirm that this renewal now has full ethical approval.

Please also ensure that the relevant requirements within the University's Code of Practice for Research and the information and guidance provided on the University's ethics webpages (available at https://intranet.birmingham.ac.uk/finance/accounting/Research-Support-Group/Research-Ethics/Links-and-Resources.aspx) are adhered to and referred to in any future applications for ethical review. It is now a requirement on the revised application form (https://intranet.birmingham.ac.uk/finance/accounting/Research-Support-Group/Research-Ethics/Ethical-Review-Forms.aspx) to confirm that this guidance has been consulted and is understood, and that it has been taken into account when completing your application for ethical review.

Please be aware that whilst Health and Safety (H&S) issues may be considered during the ethical review process, you are still required to follow the University's guidance on H&S and to ensure that H&S risk assessments have been carried out as appropriate. For further information about this, please contact your School H&S representative or the University's H&S Unit at healthandsafety@contacts.bham.ac.uk.

Kind regards

Susan Cottam
Research Ethics Officer
Research Support Group
Aston Webb Building
University of Birmingham
Edgbaston B15 2TT
Tel:
Email:
Web: https://intranet.birmingham.ac.uk/finance/RSS/Research-Support-Group/Research-Ethics/index.aspx

Please remember to submit a new Self-Assessment Form for each new project.

You can also email our team mailbox ethics-queries@contacts.bham.ac.uk with any queries relating to the University's ethics process.

Click Research Governance for further details regarding the University's Research Governance and Clinical Trials Insurance processes, or email researchgovernance@contacts.bham.ac.uk with any queries relating to

research governance.

Appendix 4.2 Email of invitation to participate in DeSSHaRM study

Dear Primary Care Healthcare Professional

We're writing to you as a healthcare professional working in primary/community healthcare team to tell you about an exciting new research study. This study is looking at how primary/community healthcare services are used or might be used to help smoking patients to protect others from secondhand smoke exposure at home. The health effects of exposure to secondhand smoke are now well established; however, we know that a large number of people, especially children, are still regularly exposed to secondhand smoke in the home.

You can share your views and experiences by completing a short online survey.

At the beginning of the survey you will be provided with a study overview followed by a set of questions to confirm that you are from the group of participants whose opinions we are looking for. This will be followed by the main study questions. The participant information sheet explains the study in more detail.

Thank you for taking the time to read this email/letter. If you would like any further information you can contact Jaidev Kaur via email: [redacted] or telephone: [redacted]

Yours faithfully,

Miss Jaidev Kaur

Postgraduate Researcher, University of Birmingham

DeSSHaRM Email Invitation
Version 1.0
23rd August 2017

Appendix 4.3 Letter of invitation to participate in DeSSHaRM study

UNIVERSITY OF BIRMINGHAM

INSTITUTE OF APPLIED HEALTH RESEARCH

Delivering secondhand smoke harm reduction messages in primary care: a cross-sectional survey (DeSSHaRM study)

LETTER OF INVITATION

(VERSION 1.0, 23rd August 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

Dear Primary Care Healthcare Professional

We're writing to you as a healthcare professional working in primary/community healthcare team to tell you about an exciting new research study. This study is looking at how primary/community healthcare services are used or might be used to help smoking patients to protect others from secondhand smoke exposure at home. The health effects of exposure to secondhand smoke are now well established; however, we know that a large number of people, especially children, are still regularly exposed to secondhand smoke in the home.

You can share your views and experiences by completing a short online survey.

At the beginning of the survey you will be provided with a study overview followed by a set of questions to confirm that you are from the group of participants whose opinions we are looking for. This will be followed by the main study questions. The enclosed participant information sheet explains the study in more detail.

Thank you for taking the time to read this email/letter. If you would like any further information you can contact Jaidev Kaur via email: [redacted] or telephone: [redacted]

Yours faithfully,

Miss Jaidev Kaur

Postgraduate Researcher, University of Birmingham

Appendix 4.4 DeSSHaRM study Participant Information Leaflet

Delivering secondhand smoke harm reduction messages in primary care: a cross-sectional survey (DeSSHaRM study)

PARTICIPANT INFORMATION SHEET

(VERSION 1.0, 23rd August 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

You are being invited to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The health risks of exposure to secondhand smoke (SHS) are well established. In the UK, the primary source of exposure to SHS is in the home environment. Reducing exposure to SHS in the home can improve the health of those living in the household, as well as leading to smokers making quit attempts. Smokers who expose others to SHS in the home, and who are not able to or ready to stop, could be offered support to reduce the harmful impact of their home smoking behaviours. Primary/community healthcare could be an ideal setting to deliver such support to smokers. Therefore, this study aims to explore the opinions of primary/community based healthcare professionals, just like you, around their opportunity, motivation and capability to support patients to reduce the SHS exposure of others in home environments.

Why have I been invited to take part?

Because you work in primary/community healthcare settings and are likely to consult with smokers who expose others to SHS in the home. You may have seen this study advertised through a membership body, training/ educational provider, special interest group, via an electronic communication, or you may have heard about if from a colleague.

Do I have to take part?

It is up to you to decide. We will describe the study in this information sheet and at the beginning of the online survey. You will also be provided with the contact details of the research team members so that you can ask any questions that you may have before completing the survey. If you decide to take part, we will ask for your consent before the research questions begin. After you begin the survey, you can choose not to respond to any questions that you would prefer not to answer.

What will I have to do if I take part?

We will provide you with a link to the online survey. This survey should take 5-10 minutes to complete. All of the research questions have a choice of responses for you to select from, which should make the survey quick and easy to complete. At the start of the survey, we will

also ask you to complete a short set of questions to ensure that you are from the groups of participants that we are looking for responses from. At the end of the survey is a set of questions relating to your qualifications, employment and experience, to enable us to describe the group of participants who have completed the survey.

What are the possible benefits of taking part?

This research may not directly benefit you, but what you tell us may help us to better understand how primary/community based healthcare professionals could support patients who smoke to reduce the SHS exposure of others in their homes. We will use the results of this study to develop support packages (interventions) to help primary/community care healthcare professionals to support smokers reduce SHS exposure in their homes.

What are the possible disadvantages and risks of taking part?

The study does not involve any treatments or tests, so there is no physical risk involved. You will however have to give up your time to answer the survey questions.

What will happen if I don't want to carry on with the study?

It is up to you if you would like to take part in this survey. Once you begin the survey, any responses that you give will be recorded. The survey is anonymous and therefore we will not be able to identify and remove any specific data that have been submitted.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher (Miss Jaidev Kaur) who will do her best to answer your questions and resolve any difficulties. If your complaint cannot be resolved by the researcher, then please contact the senior researcher (Dr Laura Jones) whose contact details are listed at the bottom of this leaflet.

If your complaint has still not been resolved then, you can contact the University of Birmingham Sponsor Representative: Dr Sean Jennings

Email: researchgovernance@contacts.bham.ac.uk

Call:

In writing to: Dr Sean Jennings, University of Birmingham, Research Support Group, Aston Webb Building, Edgbaston, Birmingham, B15 2TT

Will my taking part be kept confidential?

Yes. We will not collect any identifiable information from you during this survey. All responses that you give in answer of the survey questions will be kept strictly confidential and will be handled in accordance with the Data Protection Act 1998 and the University of Birmingham policies. Study data may be looked at by authorised persons from the University of Birmingham. They may also be looked at by authorised people from the regulatory authorities to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

What will happen to any data I give?

Electronic surveys, completed via SmartSurvey, will be hosted on a UK/EU-based server. Computer-held data will be stored on encrypted and password-protected devices approved

by the University of Birmingham. Any printed data will be securely stored in a locked drawer within a lockable office at the University of Birmingham.

The anonymous survey data will be stored securely at the University of Birmingham for 10 years after the end of the study. The data you provide will only be accessed by the study team at the University of Birmingham, or by authorised people from the regulatory authorities to check that the study is being carried out correctly.

What will happen to the results of the research study?

Researchers will review and analyse the survey data that are collected. The final results of the study will be reported as part of a doctoral thesis. The results may also be published in appropriate academic and professional journals, and presented at conferences. The researchers will provide the organisations and the study-affiliated social media platforms that were used to advertise the study with a summary of the final results for you to read if you wish. The results of this study will be used to develop support packages (interventions) to help primary/community care healthcare professionals to support smokers reduce SHS exposure in their homes.

Will I be reimbursed for my time?

We will not be offering reimbursements for participants' time in completing the survey. We have designed the survey to make it quick and easy for you to complete.

Who is organising and funding the research?

A research team based at the University of Birmingham is organising this research and it is supported financially by a PhD studentship from the College of Medical and Dental Sciences at the University of Birmingham.

Who has reviewed the study?

To protect your interests, this research has been reviewed and approved by the University of Birmingham Central Ethics Committee.

Contact details

PhD Student/Researcher: Miss Jaidev Ghag Kaur

Address: Health Sciences Research Centre, Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, B15 2TT.

Phone: [redacted]

Email: [redacted]

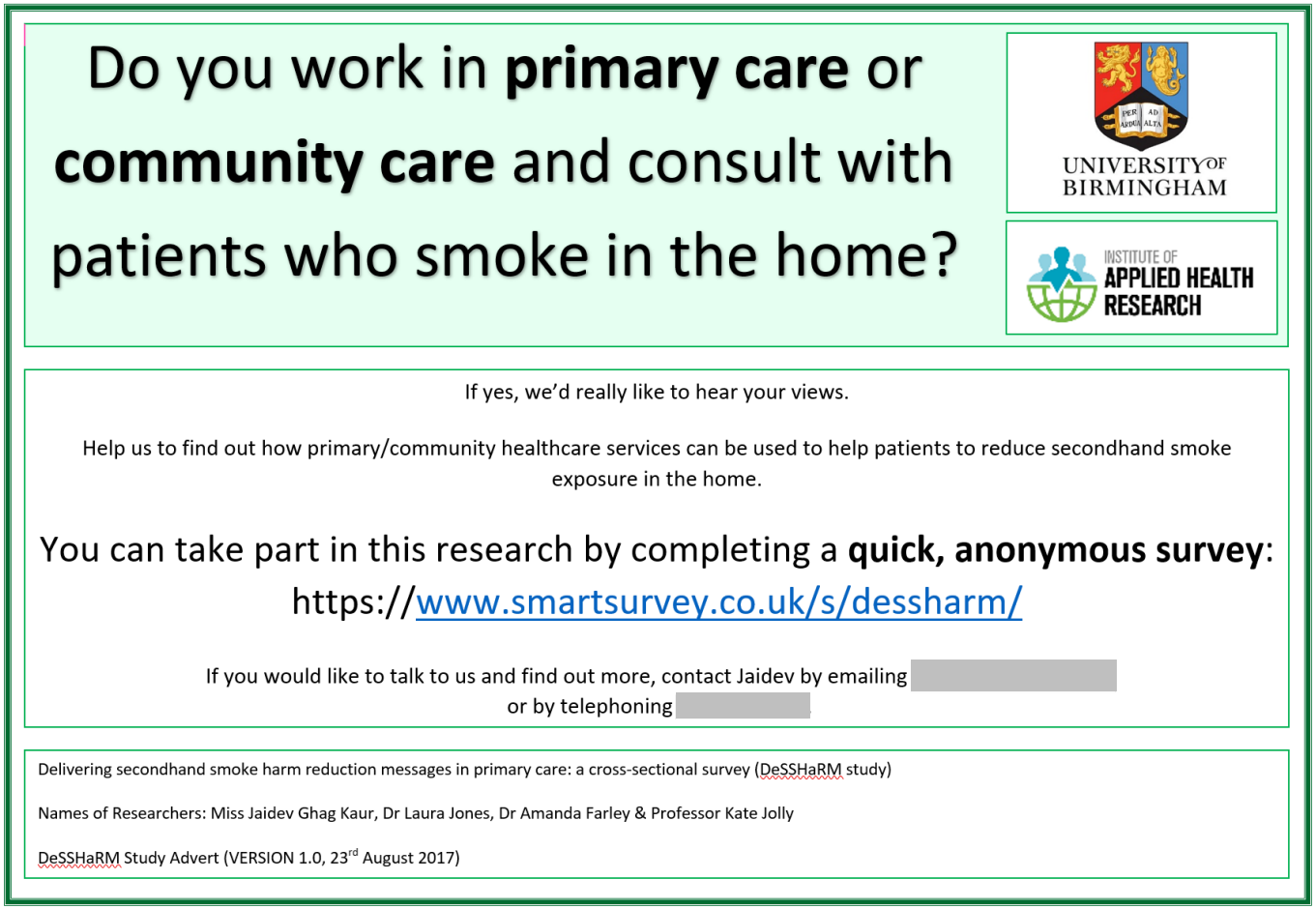
Senior Researcher: Dr Laura Jones

Address: Public Health Building, Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, B15 2TT.

Phone: [redacted]

Email: [redacted]

Appendix 4.5 DeSSHaRM study - Study Advert



Do you work in **primary care** or **community care** and consult with patients who smoke in the home?

UNIVERSITY OF BIRMINGHAM

INSTITUTE OF APPLIED HEALTH RESEARCH

If yes, we'd really like to hear your views.

Help us to find out how primary/community healthcare services can be used to help patients to reduce secondhand smoke exposure in the home.

You can take part in this research by completing a **quick, anonymous survey**:
https://www.smartsurvey.co.uk/s/dessharm/

If you would like to talk to us and find out more, contact Jaidev by emailing
or by telephoning

Delivering secondhand smoke harm reduction messages in primary care: a cross-sectional survey (DeSSHaRM study)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

DeSSHaRM Study Advert (VERSION 1.0, 23rd August 2017)

Appendix 4.6 DeSSHaRM study – Survey Instrument for data collection

Screening and Consent

Do you work as a healthcare provider?

- Yes
- No

Do you work in a UK primary/community healthcare team?

- Yes
- No

Have you read and understood the study information provided on the previous page?

- Yes
- No

Do you agree to take part in this study?

- Yes
- No

What happens in practice?

Please indicate the level of occurrence of the following tasks in your usual clinical practice:

- Never
- Rarely
- Sometimes
- Often
- Always

a) Asking non-smokers about their exposure to secondhand smoke
b) Asking smokers about others who may be exposed to secondhand smoke at home
c) Providing information on the health effects of secondhand smoke exposure
d) Delivering secondhand smoke harm reduction messages to smokers
e) Acting (e.g. referrals or medication prescription) to support smokers to reduce the exposure levels of those around them to the secondhand smoke

Capability

Please indicate your level of agreement with the following statements:

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

a) I understand what the health effects of secondhand smoke are
b) I have had sufficient training on the topic of secondhand smoke exposure
c) I do not know how to ask smokers about the secondhand smoke exposure of others in their home(s)
d) I know enough to be able to answer any questions that patients (and their carers) might have around secondhand smoke exposure
e) I do not know how to support smokers to reduce the levels of secondhand smoke exposure of those they live with, when they are not ready or not able to quit smoking

Motivation

Please indicate your level of agreement with the following statements:

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

a) It is important to intervene with smokers to help reduce others' exposure to secondhand smoke
b) Smokers want healthcare professionals to support them in reducing the health effects of secondhand smoke exposure of those they live with
c) I would feel uncomfortable intervening with smokers to help reduce others' exposure to secondhand smoke
d) Raising the issue of secondhand smoke exposure with smokers would create a problem in my professional relationship with them
e) Smokers will not engage in interventions to reduce others' exposure to the secondhand smoke

Opportunity

Please indicate your level of agreement with the following statements:

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

a) It is easier to intervene around secondhand smoke exposure during follow-up appointments with patients rather than in the first consultation
b) I have insufficient time to intervene around secondhand smoke exposure
c) I will only intervene around secondhand smoke when it causes an apparent or a worsening medical problem

d) Secondhand smoke is often a lower priority as smokers have other problems (e.g. social problems) which need to be addressed
e) I feel well supported to be able to intervene with smokers and help them to reduce others' exposure to secondhand smoke

General background information

What is your gender?

- Male
- Female
- Prefer not to say
- Not listed (please specify: ...)

What is your age?

- 24 or less
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or over
- Prefer not to say

What is your ethnic group?

- White
- Asian or Asian British
- Mixed/ multiple ethnic groups
- Black or Black British
- I do not wish to disclose my ethnic origin
- Other ethnic group (please specify: ...)

What is your highest qualification?

- No formal qualifications
- O Levels/ CSEs/ GCSEs/ Foundation Diploma
- AS or A Levels/ Advanced GNVQ
- Apprenticeship
- Degree (e.g. BA/ BSc)
- Higher degree (e.g. MSc/ PhD)
- Professional Qualification (e.g. nurse/ teacher)

Which group of healthcare professionals do you belong to?

- General Practitioner

- Nurse
- Health Visitor
- Healthcare Assistant
- Dentist
- Pharmacist
- Other (please specify: ...)

Which setting do you currently work in?

- Primary care (your work is mainly based in a GP practice)
- Community care (you see patients in clinics and home visits)

How long have you been in your current post?

- Less than 1 year
- 1 – 3 years
- 4 – 10 years
- More than 10 years

How long have you been employed in the primary care/ community sector (in any post)?

- Less than 1 year
- 1 – 3 years
- 4 – 10 years
- More than 10 years

Which part of the UK do you work in?

- England
- Ireland
- Scotland
- Wales

Do you currently smoke?

- Current smoker
- Ex-smoker
- Never smoked
- Prefer not to say

(*For current smokers only*) How many cigarettes do you smoke per day?

- 1-10
- 11-20
- 21+

(*For ex-smokers only*) When did you last smoke?

- In the last year

- 2-5 years ago
- 6-10 years ago
- More than 10 years ago

Appendix 4.7 Association between respondent characteristics and 'high' opportunity level

Table 14: Number of respondents with composite scores indicative of 'high' opportunity level to intervene around SHSe and the association with respondent characteristics

Characteristic	N (%) 'high' opportunity	Unadjusted OR (95% CI)
All	3 (1.90)	N/A
Gender		
Female (n=103)	3 (2.91)	Reference
Male(n=53)	0 (0.00)	N/A
Age		
≤34 years (n=43)	1 (2.27)	Reference
35-54 years (n=90)	2 (2.22)	0.96 (0.08, 10.83)
≥55 years (n=24)	0 (0.00)	N/A
Ethnicity		
White (n=103)	3 (2.91)	Reference
All other (n=46)	0 (0.00)	N/A
Highest qualification		
Higher degree (n=44)	0 (0.00)	Reference
All other (n=112)	3 (2.68)	N/A
Type of HCP		
General Practitioner (n=54)	1 (0.00)	Reference

Nurse or Health Visitor (n=33) Pharmacist (n=25) Other (n=43)	1 (3.03) 0 (0.00) 1 (2.27)	1.66 (0.10, 27.41) N/A 1.26 (0.08, 20.78)
Current work setting Primary care (n=79) Community care (n=81)	 2 (0.00) 1 (1.23)	 Reference 0.48 (0.04, 5.42)
Length of employment in primary or community care sector >10 years (n=85) 4-10 years (n=35) ≤3 years (n=36)	 1 (0.00) 2 (5.88) 0 (0.00)	 Reference 5.09 (0.45, 58.06) N/A
Smoking status Never smoked (n=125) Current or Ex-smoker (n=31)	 3 (2.40) 0 (0.00)	 Reference N/A

CI: confidence interval; HCP: healthcare professional; N: number; OR: odds ratio

*Statistical significance is indicated by: *p<0.05, **p<0.01, ***p<0.005.*

Appendix 5.1 Ethical Approval for the Substantial Amendments for the DeSSIP study

NHS
Health Research Authority

North East - York Research Ethics Committee

NHSBT Newcastle Blood Donor Centre
Holland Drive
Newcastle upon Tyne
NE2 4NQ

Tel:

Please note: This is the favourable opinion of the REC only and does not allow the amendment to be implemented at NHS sites in England until the outcome of the HRA assessment has been confirmed.

21 June 2018

Miss Jaidev Ghag Kaur
Postgraduate Researcher
University of Birmingham
Health Sciences Research Centre Building
Birmingham
B15 2TT

Dear Miss Ghag Kaur

Study title:	**A qualitative study to explore primary care as a setting for the delivery of secondhand smoke harm reduction messages, in cases where adults and/or children are exposed to secondhand smoke in home environments.**
REC reference:	**17/NE/0164**
Protocol number:	**RG_16-195**
Amendment number:	**Substantial Amendment 3, 02/05/2018**
Amendment date:	**05 June 2018**
IRAS project ID:	**227297**

The above amendment was by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

No ethical issues were raised.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Non-validated questionnaire [Patient Background Questionnaire]	2 - Highlighted	29 May 2018
Non-validated questionnaire [Patient Study Advert]	2 - Highlighted	29 May 2018
Non-validated questionnaire [Patient Interview Discussion Guide]	2 - Highlighted	29 May 2018
Notice of Substantial Amendment (non-CTIMP) [Notice of Substantial Amendment]	Substantial Amendment 3, 02/05/2018	05 June 2018
Research protocol or project proposal [Protocol]	2 - Highlighted	29 May 2018

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our Research Ethics Committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

17/NE/0164:	**Please quote this number on all correspondence**

Yours sincerely

pp

Mr Chris Turnock
Chair

E-mail: nrescommittee.northeast-york@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: Ms Priti Parmar, Birmingham Community Healthcare NHS Foundation Trust

North East - York Research Ethics Committee

Attendance at Sub-Committee of the REC meeting via correspondence

Committee Members:

Name	*Profession*	*Present*	*Notes*
Mrs Janet Hattle	Lay Member	Yes	
Mr Chris Turnock (Chair)	Head of Technology Enhanced Learning	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
Mrs Helen Wilson	REC Manager

Appendix 5.2 Ethical Approval for the DeSSIP study

NHS
Health Research Authority

Dr Laura L Jones
University of Birmingham
Public Health Building
Birmingham
B15 2TT

Email: hra.approval@nhs.net

22 May 2017

Dear Dr Jones

Letter of HRA Approval

Study title:	**A qualitative study to explore primary care as a setting for the delivery of secondhand smoke harm reduction messages, in cases where adults and/or children are exposed to secondhand smoke in home environments.**
IRAS project ID:	**227297**
Protocol number:	**RG_16-195**
REC reference:	**17/NE/0164**
Sponsor:	**University of Birmingham**

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The document *"After Ethical Review – guidance for sponsors and investigators"*, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the HRA website, and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the HRA website.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

IRAS project ID	227297

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

Your IRAS project ID is **227297**. Please quote this on all correspondence.

Yours sincerely

Michael Higgs
Assessor

Email: hra.approval@nhs.net

Copy to: *Miss Jaidev Ghag Kaur, University of Birmingham [Student]*
Dr Sean Jennings, University of Birmingham [Sponsor]
Ms Priti Parmar, Birmingham Community Healthcare NHS Foundation Trust [Lead NHS R&D]

IRAS project ID	227297

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

Document	*Version*	*Date*
Contract/Study Agreement [DeSSIP Patient Voucher Receipt]	1.0	04 April 2017
Copies of advertisement materials for research participants [DeSSIP Patient Study Advert]	1.0	04 April 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Confirmation of Insurance Letter]	1.0	05 May 2017
Interview schedules or topic guides for participants [DeSSIP Healthcare Professionals Interview Discussion Guide]	1.0	04 April 2017
Interview schedules or topic guides for participants [DeSSIP Patient Interview Discussion Guide]	1.0	04 April 2017
IRAS Application Form [IRAS_Form_05052017]		05 May 2017
Letter from sponsor [Confirmation of Sponsorship Letter]	1.0	05 May 2017
Letters of invitation to participant [DeSSIP Healthcare Professionals Letter or Email Invitation]	1.0	04 April 2017
Non-validated questionnaire [DeSSIP Healthcare Professionals Background Questionnaire]	1.0	04 April 2017
Non-validated questionnaire [DeSSIP Healthcare Professionals Contact Details Form]	1.0	04 April 2017
Non-validated questionnaire [DeSSIP Patient Background Questionnaire]	1.0	04 April 2017
Non-validated questionnaire [DeSSIP Patient Contact Details Form]	1.0	04 April 2017
Other [Previous REC's Provisional Opinion Letter]	1.0	03 March 2017
Other [Email Correspondence with previous REC regarding re-submission of ethical application Part 1]	1.0	14 April 2017
Other [Email Correspondence with previous REC regarding re-submission of ethical application Part 2]	1.0	14 April 2017
Other [Drafted Response Letter to Previous REC Regarding Points of Clarification]	1.0	14 April 2017
Other [Sponsor's latest insurance certificate]	1.0	28 July 2016
Other [Schedule of Events]	1	22 May 2017
Other [Statement of Activities (BCHC)]	1	22 May 2017
Other [Statement of Activities (primary care)]	1	22 May 2017
Participant consent form [DeSSIP Healthcare Professionals Consent Form]	1.0	04 April 2017
Participant consent form [DeSSIP Patient Consent Form]	1.0	04 April 2017
Participant information sheet (PIS) [DeSSIP Healthcare Professionals PIL]	1.0	04 April 2017
Participant information sheet (PIS) [DeSSIP Patient PIL]	1.0	04 April 2017
Research protocol or project proposal [DeSSIP Study Protocol]	1.0	04 April 2017
Summary CV for Chief Investigator (CI) [Laura Jones CV]	1.0	13 June 2016
Summary CV for student [Jaidev Ghag Kaur CV]	1.0	19 December 2016
Summary CV for supervisor (student research) [Kate Jolly CV]	1.0	22 December 2016
Summary CV for supervisor (student research) [Amanda Farley CV]	1.0	11 November 2016

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the, *participating NHS organisations, capacity and capability* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Name: Miss Jaidev Ghag Kaur
Email:

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/ consent documents and consent process	Yes	No comments
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	The applicant intends for the Statement of Activities and Schedule of Events to be used as agreement with participating NHS organisations in England. Although formal confirmation of capacity and capability is not expected of all or some organisations participating in this study (see *Confirmation of Capacity and Capability* section for full details), and such organisations

Section	HRA Assessment Criteria	Compliant with Standards	Comments
			would therefore be assumed to have confirmed their capacity and capability should they not respond to the contrary, we would ask that these organisations pro-actively engage with the sponsor in order to confirm at as early a date as possible. Confirmation in such cases should be by email to the CI and Sponsor confirming participation based on the relevant Statement of Activities and information within this Appendix B.
4.2	Insurance/indemnity arrangements assessed	Yes	Insurance for the management and design of the study, and for its conduct at non-NHS sites, will be provided by the sponsor. Indemnity for the conduct at NHS sites will be provided by the NHS. Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this research study
4.3	Financial arrangements assessed	Yes	No application for external study funding has been made. Funding is not available to participating organisations.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	No comments
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments

Section	HRA Assessment Criteria	Compliant with Standards	Comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Yes	The study received a favourable ethical opinion from the North East - York Research Ethics Committee on 18 May 2017.
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England

This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.
Study documents will not be shared with participating NHS organisations in England because the majority of research activities will be undertaken by external staff. No specific arrangements are expected to be put in place at each organisation to deliver the study. If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

Confirmation of Capacity and Capability

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.
The HRA has determined that participating NHS organisations in England **are not expected to formally confirm their capacity and capability to host this research**. • The HRA has informed the relevant research management offices that you intend to undertake the research at their organisation. However, you should still support and liaise with these organisations as necessary. • Following issue of the HRA Approval letter, and subject to the two conditions below, it is expected that these organisations will become participating NHS organisations 35 days after issue of this Letter of HRA Approval (no later than 26 June 2017):   ○ You may not include the NHS organisation if they provide justification to the sponsor and the HRA as to why the organisation cannot participate

- You may not include the NHS organisation if they request additional time to confirm, until they notify you that the considerations have been satisfactorily completed..

- You may include NHS organisations in this study in advance of the deadline above where the organisation confirms by email to the CI and sponsor that the research may proceed.
- The document "Collaborative working between sponsors and NHS organisations in England for HRA Approval studies, where no formal confirmation of capacity and capability is expected" provides further information for the sponsor and NHS organisations on working with NHS organisations in England where no formal confirmation of capacity and capability is expectations, and the processes involved in adding new organisations. Further study specific details are provided the *Participating NHS Organisations* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections of this Appendix.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).
A Local Collaborator may be required to put up study posters and information but all research activities will be coordinated by University Principal Investigator. GCP training is not a generic training expectation, in line with the HRA statement on training expectations.

HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken
The university researchers would require a Letter of Access to come on site and have contact with patients.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.
The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

Appendix 5.3 DeSSIP study – Letter/email of invitation for the healthcare professional participation

UNIVERSITY OF BIRMINGHAM

Delivering secondhand smoke interventions in primary care (DeSSIP study)

HEALTHCARE PROFESSIONAL INVITATION

(VERSION 1.0, 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

Dear Primary Care Healthcare Professional

Thank you for thinking about taking part in our study.

This research is looking at how primary care services are used or might be used to help smoking patients to protect others from secondhand smoke exposure at home. The health effects of exposure to secondhand smoke are now well established; however, we know that a large number of people, especially children, are still regularly exposed to secondhand smoke in the home.

We are interested in talking to you because you are a key healthcare professional in the primary care sector who has personal experience, knowledge and in-sight in to working with smoking patients in Birmingham.

The enclosed participant information leaflet explains the study in more detail and you should read it carefully before deciding if you would like to take part.

You will be asked if you would like to take part in an individual one-to-one interview with the researcher. This interview will typically last for 45-60 minutes but this will vary depending on how much you have to say. This discussion can be face to face (in a location of your choice) or via telephone.

You will also be asked to complete a short questionnaire which will include questions relating to your qualifications, employment and experience at the start of the interview.

Thank you for taking the time to read this email/letter. If you would like any further information you can contact Jaidev Kaur via email: [redacted]

Yours faithfully,

Miss Jaidev Kaur

Postgraduate Researcher, University of Birmingham

Appendix 5.4 DeSSIP study – Healthcare professional Participant Information Leaflet

Delivering secondhand smoke interventions in primary care (DeSSIP study)

HEALTHCARE PROFESSIONAL PARTICIPANT INFORMATION LEAFLET

(VERSION 1.0, 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

Part 1

You are being invited to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

The health risks of exposure to secondhand smoke (SHS) are well established. In the UK, the primary source of exposure to SHS is in the home environment. Smokers who expose others to SHS in the home, and who are not able to or ready to stop, could be offered support to reduce the harmful impact of their home smoking behaviours. Reducing exposure to SHS in the home can improve the health of those living in the household, as well as leading to smokers making quit attempts. Primary care could be an ideal setting to deliver such support to smokers. Therefore, this study will explore the following with primary care health professionals:

- Which patients would benefit from receiving support around secondhand smoke
- What experiences primary care healthcare professionals have of providing information and services to help patients who smoke to reduce secondhand smoke exposure in their homes
- What the capability, opportunity and motivation of healthcare professionals is to influence how they support patients with reducing secondhand smoke exposure in homes
- What ideas primary care healthcare professionals have around supporting smoking patients to reduce secondhand smoke exposure in homes, as part of their everyday practice

Why have I been invited to take part?

Because you work in primary health care and are likely to engage with smokers who expose others to secondhand smoke in the home. You may have seen this study advertised through a membership body, via electronic communication, or heard about if from your practice manager or a colleague.

Do I have to take part?

It is up to you to decide. We will describe the study and go through this information sheet, which we will then give to you. You are free to ask any questions that you may have during this process. If you decide to take part, we will ask you to sign a consent form to show you have agreed to take part. We will make sure you have sufficient time to decide about whether or not to take part in this study.

What will I have to do if I take part?

We will invite you to take part in a one-off interview (informal discussion with a researcher) to explore your thoughts and experiences around providing support to help patients who smoke to reduce secondhand exposure to others in their home. You can choose whether the discussion takes place at the University of Birmingham or in your place of work. It may be possible to have a discussion over the telephone if this is more convenient. This informal, one-to-one discussion will be audio recorded to allow the researcher to pay full attention to what you are saying. Recording the interview will also allow the research team to do further analysis at a later date. Typically, interviews can last between 45 – 60 minutes, but can be shorter or longer than this depending on how much there is to discuss. At the start of the interview, we will also ask you to complete a short questionnaire which will include questions relating to your qualifications, employment and experience.

What are the possible benefits of taking part?

This research will not directly benefit you, but what you tell us may help us to understand how primary care based healthcare professionals can support patients who smoke to reduce secondhand smoke exposure in their homes.

What are the possible disadvantages and risks of taking part?

The study does not involve any treatments or tests. So, there is no physical risk involved. You will however have to give up your time to take part in an interview. It is also possible that talking to us during the interview might be upsetting (although this is very unlikely). You will be treated with respect at all times during this study and you will be able to take breaks or withdraw from the interview at any time.

Will my taking part in the study be kept confidential?

Yes, we will follow ethical and legal practices and all information about you will be handled in confidence. The details are included in part 2 of this information sheet.

If the information in Part 1 has interested you and you are considering taking part, please read the additional information in Part 2 before making a final decision.

Part 2

What will happen if I don't want to carry on with the study?

You can withdraw from the study at any time and without giving a reason. If you withdraw, any information collected before your withdrawal will be kept and used anonymously for the research.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher who will do her best to answer your questions and resolve any difficulties. If your complaint cannot be resolved by the researcher, then please contact the senior researcher (Dr Laura Jones) listed at the bottom of this leaflet.

If your complaint has still not been resolved then, you can contact the University of Birmingham Sponsor Representative: Dr Sean Jennings.

Email: researchgovernance@contacts.bham.ac.uk

Call:

In writing to: Dr Sean Jennings, University of Birmingham, Research Support Group, Aston Webb Building, Edgbaston, Birmingham, B15 2TT

Will my taking part be kept confidential?

Yes. All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which leaves the University will have your name and address removed so that you cannot be identified. If you join the study, some parts of the data collected will be looked at by authorised persons from the University of Birmingham. They may also be looked at by authorised people from the regulatory authorities to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

What will happen to any data I give?

We will ask you to complete a contact details form so that we can contact you about your interview arrangements (where necessary). If you would like to hear about the results of this study when it is finished and about future study activities, you can choose to allow us to use your contact details to be used for this purpose. This information will be securely stored until 12 months after the end of this study when it will be safely deleted.

The audio-recording of the interview will be used to produce a typed record of the discussion, known as a transcript. This transcription will be done by a member of the research team and/or by a specialist transcription company who will sign an agreement to keep your data confidential and stored securely. We will analyse the anonymised transcripts as part of our research. Your personal data (e.g. your name and telephone number) will be stored securely at the University of Birmingham and will be safely deleted 12 months after the main results of the study are published. The audio recordings will be stored and managed in the same way as personal data. The anonymised survey data and transcripts will be stored securely at the University of Birmingham for 10 years after the end of the study. The data you provide will only be accessed by the study team at the University of Birmingham, or by authorised people from the regulatory authorities to check that the study is being carried out correctly.

What will happen to the results of the research study?

Researchers will review all of the data collected from the interviews. The final results of the study will be reported to the sponsor of the research, will form part of a doctoral thesis, and will be published in appropriate academic and professional journals, and presented at

conferences. The researchers will provide you with a summary of the final results if you wish. The results of this study will be used to develop support packages (interventions) to help primary care healthcare professionals to support smokers reduce secondhand smoke exposure in their homes.

Will I be reimbursed for my travel expenses?

We will reimburse your travel expenses if you decide to travel to an interview at the University of Birmingham.

Who is organising and funding the research?

The University of Birmingham is sponsoring this research and it is supported financially by a PhD studentship from the College of Medical and Dental Sciences at the University of Birmingham.

Who has reviewed the study?

To protect your interests, all research in the NHS is looked at by an independent group of people, called a Research Ethics Committee. This study has been reviewed and has received a favourable opinion by the North East - York Research Ethics Committee.

Contact details

PhD Student/Researcher: Miss Jaidev Ghag Kaur

Address: [redacted], Health Sciences Research Centres, Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, B15 2TT.

Phone: [redacted]

Email: [redacted]

Senior Researcher: Dr Laura Jones

Address: Public Health Building, Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, B15 2TT.

Phone: [redacted]

Email: [redacted]

Appendix 5.5 DeSSIP study – Healthcare Professional Contact Details Form

UNIVERSITY OF BIRMINGHAM

Participant ID: ☐☐☐☐

Delivering secondhand smoke interventions in primary care (DeSSIP study)

HEALTHCARE PROFESSIONAL CONTACT DETAILS FORM

(VERSION 1.0; 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

First Name: .....
Surname: .....
Date of Birth: .....

Address: .....
.....
.....
Postcode: .....

Home phone: .....
Mobile: .....
Email: .....

Please indicate your preferred method of contact:

Email ☐ Post ☐ Phone ☐

By completing and signing this form you are agreeing to be contacted by a member of the DeSSIP research team based at the University of Birmingham. They will give you further information about the interviews that are being conducted with patients and primary care healthcare professionals as part of the DeSSIP study.

Signature:..... Date:.....

Appendix 5.6 DeSSIP study – Healthcare Professional Consent Form

UNIVERSITY OF BIRMINGHAM

Participant ID: | | | | |

Delivering secondhand smoke interventions in primary care (DeSSIP study)

HEALTHCARE PROFESSIONAL CONSENT FORM

(Version 1.0; 4th April 2017)

Name of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

		Participant: Please initial each section	**Researcher:** Please initial each section
1.	I confirm that I have **read** and **understood** the information leaflet version 1.0, dated 04/04/2017 for the above study and have had the opportunity to ask questions and have had these answered to my satisfaction		
2.	I understand that my **participation is voluntary** and that I am free to withdraw at any time, without giving a reason and without my legal rights being affected		
3.	**I agree to take part** in the above study and consent to participate in an interview		
4.	I agree to the interview being **audio-recorded** and understand that the recordings will be kept safe at the University of Birmingham and that everything I say will be kept **confidential** in accordance with the Data Protection Act 1998. I understand that this audio-recording may be sent to a transcription company, who will sign a confidentiality and data storage agreement.		
5.	I give permission for **authorised individuals** (from the University of Birmingham, regulatory authorities, or from the NHS) to have access to my data collected during this research		
6.	I give permission for my **identifiable data** to be safely stored at the University of Birmingham for 12 months after the publication of the main study results.		
7.	**I agree that quotes** from the interview can be used **anonymously** in any publication of the research findings		
For the following questions, please circle your answer and then initial on the right.			
8. Would you like to receive a **copy of the results** of this study? Yes No			
9. Would you like to be **contacted** about future events related to this study? Yes No			
10. Do you give permission for your **anonymised data** to be used in future studies/for secondary analysis? Yes No			

Name of person giving consent (Participant)	Signature	Date
Name of person taking consent (Researcher)	Signature	Date

When completed one copy for participant, one copy for research site file

Appendix 5.7 DeSSIP study – Healthcare Professional Background Questionnaire

UNIVERSITY OF BIRMINGHAM

Participant ID: ☐☐☐☐

Delivering secondhand smoke interventions in primary care (DeSSIP study)

HEALTHCARE PROFESSIONAL BACKGROUND QUESTIONNAIRE

(VERSION 1.0, 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

BACKGROUND INFORMATION

1. What is your gender?

☐ Male ☐ Not listed: _____ (please specify)
☐ Female ☐ Prefer not to say

2. What is your age?

_____ Years

3. What is your ethnic group?

☐ White ☐ Mixed/ multiple ethnic groups
☐ Asian/ Asian British ☐ Black/ African/ Caribbean/ Black British
☐ Other _____ (please specify)

QUALIFICATIONS AND EMPLOYMENT

4. What is your highest qualification? (Please tick only one box)

☐ No formal qualifications ☐ O levels/ CSEs/ GCSEs/ Foundation Diploma
☐ Apprenticeship ☐ AS or A Levels/ Advanced GNVQ
☐ Degree (e.g. BA/ BSc) ☐ Higher Degree (e.g. MSc/ PhD)
☐ Professional Qualification (e.g. nurse/ teacher)
☐ Other _____ (please specify)

UNIVERSITY OF BIRMINGHAM

5. What is the title of your current post?
_____ (please specify)

6. How long have you been in your current post?
_____ (please specify)

7. Who are you currently employed by?
_____ (please specify)

8. How long have you worked in the primary care sector (in any post)?
☐ Less than 1 year ☐ 1-3 years ☐ 4-10 years ☐ More than 10 years

SMOKING BEHAVIOUR

9. Do you currently smoke?
☐ Current smoker ☐ Ex-smoker ☐ Never smoked

10. How many cigarettes do you smoke per day?
☐ 1-10 ☐ 11-20 ☐ 21+

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE

Appendix 5.8 DeSSIP study – Healthcare Professional Interview Discussion Guide

UNIVERSITY OF BIRMINGHAM

NHS Health Research Authority

Delivering secondhand smoke interventions in primary care (DeSSIP study)

HEALTHCARE PROFESSIONALS INTERVIEW DISCUSSION GUIDE

(VERSION 1.0, 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

Introduction

- Thank the participant
- Ask for consent to audio record, explain confidentiality and how the data will be stored and used
- Explain the participant's right to withdraw and reinforce that their participation will in no way affect their healthcare
- Check the participation consent form has been signed (keep a copy and give one copy to the participant)
- Give a summary of the study and explain the value of their opinions (explore views - not a test)
- Give an opportunity for the participant to ask questions
- Explain format of the interview – informal discussion for ~45-60 minutes followed by a quick (~2-5 minute) survey at the end to collect information to allow discussion of the transferability of study results
- Begin interview and turn on recorder

1. Ice breaker questions (overlaps into other questions but this should get participants thinking about the topic ready for later questions)
    a. Explore their knowledge about SHS and SHS exposure
        i. Could you tell me what you know about SHS exposure?
    b. Explore their practices around SHS exposure
        i. Do you see patients who have been exposed to SHS in the home or who expose others to SHS in the home?
        ii. How do you identify these groups?
        iii. What do you normally do if you identify a patient like this?

2. "Vulnerable" population and target audience (Building on question 1b)
    a. Explore who (which patient groups/ accompanying members) they are likely to discuss SHS with.

   b. Explore when (or if) they give advice on SHS, who do they think the best people are to talk to about reducing SHS?
3. Narrative style question – current experiences/ practices (building on question 1b(iii))
   a. Can you describe for me your experiences of delivering SHS messages in practice?

The following three questions are to build on the answer given in question 3:

4. Capability (physical and psychosocial)
   a. Do they feel they have the knowledge and skills to deliver SHS harm reduction messages to patients and their household members?
   b. Explore their reasons for this (lack of) confidence in their knowledge and skills in this matter
   c. Are there any particular skills/ education that would be needed to help them to deliver SHS harm reduction messages?

5. Opportunities (influencing factors) and lack of opportunities
   a. Explore whether there are any environmental factors that affect their delivery of SHS harm reduction messages?
      i. How does your working environment and the available resources affect your practices around delivering messages to reduce SHS exposure?
      ii. Do these help or prevent you from delivering SHS harm reduction messages?
   b. Explore the effects of social influences
      i. Are there any social influences that help or prevent you from delivering SHS harm reduction messages?
         - Colleagues inside/ outside of workplace, Managers/ supervisors, Professional/ membership bodies, or Other.
      ii. What influence these have?

6. Motivation (reflective and automatic) and reasoning
   a. Beliefs about roles, capabilities, and outcomes?
      i. Whose role is it to address SHS exposure?
      ii. Explore how they find delivering SHS harm reduction messages to your patients and their household members?
      iii. What do they think will happen after they deliver a harm reduction message?
   b. Do they want to deliver SHS harm reduction messages?
      i. Explore why (not)?
      ii. Are there any incentives for delivering SHS harm reduction messages? If yes, do these work well?
      iii. Is it possible to deliver SHS reduction messages as part of patient consultations? Why (not)?
      iv. What influences decisions on whether or not to discuss SHS with patients?

Round off questions

7. Ideas around potential future interventions
   - Explore any ideas of interventions that may be used in primary care settings to reduce secondhand smoke harm reduction
     - **Who** would be **targeted**? Who would **deliver** them?
     - **What** would it involve?
     - Timescale over which it could be delivered? **When** & **how often**?
     - Supportive measures?
8. Process evaluation
   - Explore participants' reflections on their involvement in this study (recruitment and interview)
9. Future research
   - Explore their attitude towards being involved in future research to test the use of an intervention to reduce secondhand smoke related harm
   - Explore their views on helping to disseminate study results
10. Is there anything they would like to add?

Closing

- End of the interview
- Check / clarify points back with the interviewee as necessary
- If they wanted to receive the results of the study explain when they should expect these by. If not, give them the option again
- Reminder about confidentiality and snowballing for participants
- Thank them for their time

Appendix 5.9 DeSSIP study – Study Advert for recruitment of service users

Are you a smoker who lives with other people? **Do you currently or have you ever** smoke**d at home**?

If yes, we'd love to hear your thoughts.

Help us to find out how primary care services can be used to help patients to reduce secondhand smoke exposure in the home

If you would like to talk to us and find out more, contact the team by emailing us via [redacted]
or [redacted] or by telephoning [redacted] / [redacted]

Delivering secondhand smoke interventions in primary care (DeSSIP study)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

DeSSIP Patient Study Advert (VERSION **2**.0, **29th 2018**, IRAS ID: 227297)

UNIVERSITY OF BIRMINGHAM

Appendix 5.10 DeSSIP study – Participant Information Leaflet for service users

Delivering secondhand smoke interventions in primary care (DeSSIP study)

PATIENT PARTICIPANT INFORMATION LEAFLET

(VERSION 1.0, 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

Part 1

You are being invited to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

This research study is looking at the whether smokers would like to talk to their healthcare professional (e.g. their GP or health visitor) about smoking in the home and whether they would like to receive advice on how they can change their home smoking behaviours to protect the health of other people who they live with. It is hoped that we will be able to develop a package of support for smoking patients.

Why have I been invited to take part?

Because you are a person who has some personal experience, knowledge and in-sight about smoking in a home where non-smokers are sometimes present. You may have heard about this study from your healthcare professional, a member of the research team, or from a friend who thought that you might like to take part. You may also have seen the study advertised on a poster.

Do I have to take part?

It is up to you to decide. We will describe the study and go through this information sheet, which we will then give to you. You are free to ask any questions that you may have during this process. If you decide to take part, we will ask you to sign a consent form to show you have agreed to take part. We will make sure you have sufficient time to decide whether or not you want to take part in this study.

What will I have to do if I take part?

We will invite you to take part in a one-off interview (informal discussion with a researcher) to explore your thoughts and experiences of receiving advice around reducing smoking in the home. You can choose whether the discussion takes place at the University of Birmingham or in your own home. It may be possible to have a discussion over the telephone if this is more convenient. This informal, one-to-one discussion will be audio

recorded to allow the researcher to pay full attention to what you are saying. Recording the interview will also allow the research team to do further analysis at a later date. Typically, interviews can last between one hour and one and a half hours, but can be shorter or longer than this depending on how much there is to discuss. At the start of the interview, we will also ask you to complete a short questionnaire which will include questions relating to your household, smoking behaviours and your use of primary care services.

What are the possible benefits of taking part?

This research will not directly benefit you, but what you tell us may help us to understand patients' experiences of receiving advice from healthcare professionals and should help us to develop a support package for patients to help them to change their home smoking behaviours.

What are the possible disadvantages and risks of taking part?

The study does not involve any treatments or tests. So, there is no physical risk involved. You will however have to give up your time to take part in an interview. It is also possible that talking to us during the interview might be upsetting (although this is very unlikely). You will be treated with respect at all times during this study and you will be able to take breaks or withdraw from the interview at any time.

Will my taking part in the study be kept confidential?

Yes, we will follow ethical and legal practices and all information about you will be handled in confidence. The details are included in part 2 of this information sheet.

If the information in Part 1 has interested you and you are considering taking part, please read the additional information in Part 2 before making a final decision.

Part 2

What will happen if I don't want to carry on with the study?

You can withdraw from the study at any time and without giving a reason. A decision to withdraw at any time or a decision to not take part will not affect the standard of care you receive. If you withdraw, any information collected before your withdrawal will be kept and used anonymously for the research.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher who will do her best to answer your questions and resolve any difficulties. If your complaint cannot be resolved by the researcher, then please contact the senior researcher (Dr Laura Jones) listed at the bottom of this leaflet. You can also contact your healthcare provider if you would like to discuss anything related to this project.

If you have concerns about the way you have been approached or treated during the course of this study, you may wish to contact Customer Services (formally PALS) at the Birmingham Community Healthcare NHS Foundation Trust.

Email: contact.bchc@nhs.net

Call: [redacted]

In writing to: Patient Experience Team, The Lodge, Moseley Hall Hospital, Alcester Road, Moseley, Birmingham, B13 8JL

Will my taking part be kept confidential?

Yes. All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which leaves the University will have your name and address removed so that you cannot be identified. If you join the study, some parts of the data collected will be looked at by authorised persons from the University of Birmingham. They may also be looked at by authorised people from the regulatory authorities to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

What will happen to any data I give?

We will ask you to complete a contact details form so that we can contact you about your interview arrangements (where necessary). If you would like to hear about the results of this study when it is finished and about future study activities, you can choose to allow us to contact you for this purpose. This information will be securely stored until 12 months after the end of this study when it will be safely deleted.

The audio-recording of the interview will be used to produce a typed record of the discussion, known as a transcript. This transcription will be done by a member of the research team and/or by a specialist transcription company who will sign an agreement to keep your data confidential and stored securely. We will analyse the anonymised transcripts as part of our research. Your personal data (e.g. your name, address and telephone number) will be stored securely at the University of Birmingham and will be safely deleted 12 months after the main results of the study are published. The audio recordings will be stored and managed in the same way as personal data. The anonymised survey data and transcripts will be stored securely at the University of Birmingham for 10 years after the end of the study. The data you provide will only be accessed by the study team at the University of Birmingham, or by authorised people from the regulatory authorities to check that the study is being carried out correctly.

What will happen to the results of the research study?

Researchers will review all of the data collected from the interviews. The final results of the study will be reported to the sponsor of the research, will form part of a doctoral thesis, and will be published in appropriate academic and professional journals, and presented at conferences. The researchers will provide you with a summary of the final results if you wish. The results of this study will be used to develop support packages (interventions) which will use primary care services to help patients change their home smoking behaviours.

Will I be reimbursed for my time?

We will reimburse your travel expenses if you decide to travel to an interview at the University of Birmingham. You will be given a high street shopping voucher worth £10 as a thank you for your time at the end of the interview.

Who is organising and funding the research?

The University of Birmingham is sponsoring this research and it is supported financially by a PhD studentship from the College of Medical and Dental Sciences at the University of Birmingham.

Who has reviewed the study?

To protect your interests all research in the NHS is looked at by an independent group of people, called a Research Ethics Committee. This study has been reviewed and has received a favourable opinion by the North East - York Research Ethics Committee.

Contact details

PhD Student/Researcher: Miss Jaidev Ghag Kaur

Address: [redacted], Health Sciences Research Centres, Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, B15 2TT.

Phone: [redacted]

Email: [redacted]

Senior Researcher: Dr Laura Jones

Address: Public Health Building, Institute of Applied Health Research, University of Birmingham, Edgbaston, Birmingham, B15 2TT.

Phone: [redacted]

Email: [redacted]

Appendix 5.11 DeSSIP study – Voucher Receipt for service user participants

UNIVERSITY OF BIRMINGHAM

Participant ID: | | | | |

Delivering secondhand smoke interventions in primary care (DeSSIP study)

PATIENT VOUCHER RECEIPT

(VERSION 1.0; 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

I..... (print name) have received a £10 retail voucher for participating in an interview for the DeSSIP study.

Name of person receiving voucher (Participant)	Signature	Date

Name of person giving Voucher (Researcher)	Signature	Date

When completed one copy for participant, one copy for research site file

Appendix 5.12 DeSSIP study – Contact details form for service user participants

UNIVERSITY OF BIRMINGHAM

Participant ID: ☐☐☐☐

Delivering secondhand smoke interventions in primary care (DeSSIP study)

PATIENT CONTACT DETAILS FORM

(VERSION 1.0; 4th April 2017)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

First Name: .....
Surname: .....
Date of Birth: .....

Address: .....
.....
.....
Postcode: .....

Home phone: .....
Mobile: .....
Email: .....

Please indicate your preferred method of contact:

Email ☐ Post ☐ Phone ☐

By completing and signing this form you are agreeing to be contacted by a member of the DeSSIP research team based at the University of Birmingham. They will give you further information about the interviews that are being conducted with patients and primary care healthcare professionals as part of the DeSSIP study.

Signature:..... Date:.....

Appendix 5.13 DeSSIP study – Consent form for service user participants

UNIVERSITY OF BIRMINGHAM

Participant ID: | | | | |

Delivering secondhand smoke interventions in primary care (DeSSIP study)

PATIENT CONSENT FORM

(Version 1.0; 4th April 2017)

Name of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

		Participant: Please initial each section	**Researcher:** Please initial each section
1.	I confirm that I have **read** and **understood** the information leaflet version 1.0, dated 04/04/2017 for the above study and have had the opportunity to ask questions and have had these answered to my satisfaction		
2.	I understand that my **participation is voluntary** and that I am free to withdraw at any time, without giving a reason and without my legal rights being affected		
3.	**I agree to take part** in the above study and consent to participate in an interview		
4.	I agree to the interview being **audio-recorded** and understand that the recordings will be kept safe at the University of Birmingham and that everything I say will be kept **confidential** in accordance with the Data Protection Act 1998. I understand that this audio-recording may be sent to a transcription company, who will sign a confidentiality and data storage agreement.		
5.	I give permission for **authorised individuals** (from the University of Birmingham, regulatory authorities, or from the NHS) to have access to my data collected during this research		
6.	I give permission for my **identifiable data** to be safely stored at the University of Birmingham for 12 months after the publication of the main study results.		
7.	**I agree that quotes** from the interview can be used **anonymously** in any publication of the research findings		
For the following questions, please circle your answer and then initial on the right.			
8. Would you like to receive a **copy of the results** of this study? Yes No			
9. Would you like to be **contacted** about future events related to this study? Yes No			
10. Do you give permission for your **anonymised data** to be used in future studies/for secondary analysis? Yes No			

Name of person giving consent (Participant)	Signature	Date
Name of person taking consent (Researcher)	Signature	Date

When completed one copy for participant, one copy for research site file

Appendix 5.14 DeSSIP study – Background Questionnaire for service user particpants

UNIVERSITY OF BIRMINGHAM

Participant ID: ☐☐☐☐

Delivering secondhand smoke interventions in primary care (DeSSIP study)

PATIENT BACKGROUND QUESTIONNAIRE

(Version 2.0, 29th May 2018)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

BACKGROUND INFORMATION

1. What is your gender?
   - ☐ Male
   - ☐ Female
   - ☐ Not listed: _____ (please specify)
   - ☐ Prefer not to say

2. What is your age?
   _____ Years

3. What is your ethnic group?
   - ☐ White
   - ☐ Asian/ Asian British
   - ☐ Mixed/ multiple ethnic groups
   - ☐ Black/ African/ Caribbean/ Black British
   - ☐ Other _____ (please specify)

4. What is your legal marital status? (Please tick only one box)
   - ☐ Single
   - ☐ Cohabiting/living together
   - ☐ Divorced
   - ☐ Separated
   - ☐ Married
   - ☐ Civil Partnership
   - ☐ Widowed

5. What is the first half of your postcode? (First 3-4 digits only, e.g. B15)
   _____ (please specify)

UNIVERSITY OF BIRMINGHAM

QUALIFICATIONS AND EMPLOYMENT

6. What is your highest qualification? (Please tick only one box)

- ☐ No formal qualifications
- ☐ O levels/ CSEs/ GCSEs/ Foundation Diploma
- ☐ Apprenticeship
- ☐ AS or A Levels/ Advanced GNVQ
- ☐ Degree (e.g. BA/ BSc)
- ☐ Higher Degree (e.g. MSc/ PhD)
- ☐ Professional Qualification (e.g. nurse/ teacher)
- ☐ Other _____ (please specify)

7. Are you currently employed?

- ☐ Employed
- ☐ Self-employed
- ☐ Housewife/ husband
- ☐ Unemployed
- ☐ Retired
- ☐ Actively seeking employment

8. Is your partner currently employed? (if applicable)

- ☐ Not applicable
- ☐ Employed
- ☐ Self-employed
- ☐ Housewife/ husband
- ☐ Unemployed
- ☐ Retired
- ☐ Actively seeking employment

YOUR HOUSEHOLD

9. How many dependents do you care for?
_____ (please specify)

10. How many adults (over 18 years) currently live in your household?
_____ (please specify)

11. How many children (under 18 years) currently live in your household?
_____ (please specify)

12. How many people smoke in your house?
_____ (please specify)

13. How many non-smokers stay in your house?
_____ (please specify)

14. How old are the non-smokers in your house?
_____ (person 1)
_____ (person 2)
_____ (person 3)
_____ (person 4)
_____ (person 5)
_____ (person 6)

15. How are **you** related to the **non-smokers** in your house? (tick all that apply?)

- ☐ Parent/guardian/carer of child
- ☐ Child
- ☐ Spouse/partner/boyfriend or girlfriend
- ☐ Other family member
- ☐ Housemate/ roommate
- ☐ Grandparent
- ☐ Grandchild
- ☐ Sibling (step-/adopted/half-/full)
- ☐ Friend or neighbour
- ☐ Other _____ (please specify)

16. How are **you** related to the other **people who smoke** in your house? (tick all that apply?)

- ☐ Not Applicable
- ☐ Parent/guardian/carer of child
- ☐ Child
- ☐ Spouse/partner/boyfriend or girlfriend
- ☐ Other family member
- ☐ Housemate/ roommate
- ☐ Grandparent
- ☐ Grandchild
- ☐ Sibling (step-/adopted/half-/full)
- ☐ Friend or neighbour
- ☐ Other _____ (please specify)

SMOKING BEHAVIOUR

17. How many cigarettes do you smoke per day?

☐ 1-10 ☐ 11-20 ☐ 21+

18. When did you last smoke inside a house?

☐ **In the last week** ☐ **In the last month** ☐ **In the last 6 months**
☐ **In the last year** ☐ **1-5 years ago** ☐ **6-10 years ago**

19. Does your partner currently smoke? (if applicable)

☐ Not Applicable
☐ Current smoker ☐ Ex-smoker ☐ Never smoked

20. How many cigarettes does your partner smoke per day?

☐ Not Applicable
☐ 1-10 ☐ 11-20 ☐ 21+

USE OF PRIMARY CARE SERVICES

21. How often do you use primary care services for your **own** health management?

☐ Less than once a year ☐ Once a year ☐ Once every 6 months
☐ 2+ times every 6 months ☐ Once a month ☐ 2+ times a month

22. How often do you use primary care services for the health management of one of your **householders**?

☐ Less than once a year ☐ Once a year ☐ Once every 6 months
☐ 2+ times every 6 months ☐ Once a month ☐ 2+ times a month

23. In the last 12 months, how many times in total have you visited a primary care service?

☐ None ☐ 1 time ☐ 2
☐ 3-4 ☐ 5-9 ☐ 10 or more

24. Which primary care service providers did you see?

☐ General Practitioner ☐ Nurse ☐ Health visitor
☐ Health Care Assistant ☐ Dentist ☐ Pharmacist
☐ Other _____
(please specify)

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE

Appendix 5.15 DeSSIP study – Service users Interview Discussion Guide

UNIVERSITY OF BIRMINGHAM

NHS Health Research Authority

Delivering secondhand smoke interventions in primary care (DeSSIP study)

PATIENT INTERVIEW DISCUSSION GUIDE

(Version 2.0, 29th May 2018)

Names of Researchers: Miss Jaidev Ghag Kaur, Dr Laura Jones, Dr Amanda Farley & Professor Kate Jolly

Introduction

- Thank the participant
- Ask for consent to audio record, explain confidentiality and how the data will be stored and used
- Explain the participant's right to withdraw and reinforce that their participation will in no way affect their healthcare
- Check the participation consent form has been signed (keep a copy and give one copy to the participant)
- Give a summary of the study and explain the value of their opinions (explore views - not a test)
- Give an opportunity for the participant to ask questions
- Explain format of the interview – informal discussion for ~60-90 minutes followed by a quick (~2-5 minute) survey at the end to collect information to allow discussion of the transferability of study results
- Begin interview and turn on recorder

1. Ice breaker questions (overlaps into other questions but this should get participants thinking about the topic ready for later questions)
    1. Explore their knowledge about SHS and SHS exposure
        1. Could you tell me what you know about SHS exposure?
    2. Explore their experiences of SHS exposure interventions in primary care
        1. Has anyone ever spoken to you about SHS? What did they say?
        2. Have you ever tried to reduce SHS in the home? How was this?

2. Motivation
    1. Explore their views on the need to reduce harm(s) caused by SHS
    2. Explore previous reasons for stopping trying to reduce SHS (if applicable)
    3. Explore how they would respond to receiving advice/help to reduce harm caused by secondhand smoke in primary care settings. Is this something they would like to receive in primary care?
    4. Explore their views on the roles of different HPHWs in primary care in relation to SHS harm reduction interventions. Would they expect to be asked about SHS in the home? If so, by whom and when? Who would they like to receive SHS harm reduction messages from?
    5. Do they think it's possible to receive SHS harm reduction interventions in primary care? Why (not)?
    6. Explore their beliefs about consequences of receiving SHS harm reduction messages from primary HPHWs.

7. **Explore methods being used to reduce SHS exposure inside the home.**
8. **If patients indoor smoking behaviours have changed, which factors helped or hindered these changes?**

3. Capability
    1. Do they feel confident in primary care health professionals and health-related workers' knowledge and skills to help them reduce SHS in the home? Explore if there are differences for different HPHWs or differences between primary and secondary care workers?
    2. What knowledge and skills would they want to be given by primary care HPHWs to help them reduce SHS exposure in the home?
4. Opportunity
    1. Explore how they use the primary care system and in which of these opportunities do they feel it would be acceptable to receive SHS harm reduction messages.
        1. Does this acceptability change in different scenarios? (pre-booked appointment vs. an appointment they have been waiting for with an on-call doctor, or an appointment for a one-off ailment unrelated to smoking vs. an appointment for a long-term health condition, etc.)
    2. Explore whether the presence of others in the appointment would influence this acceptability.
        1. Does this depend on who the other person is? (medical student, their non-smoking child, the partner who smokes, their partner who doesn't like their smoking habit, etc.)

5. Round off questions
    1. Summary of ideas generated already re: potential future interventions
    - Summarise the participants' ideas about interventions that may be used in primary care settings to reduce secondhand smoke harm reduction
        - **Who** would be **targeted**? Who would **deliver** them?
        - **What** would it involve?
        - Timescale over which it could be delivered? **When** & **how often**?
        - Supportive measures?
    2. Is there anything they would like to add?
    3. Process evaluation
    - Explore participants' reflections on their involvement in this study (recruitment and interview)
    4. Future research
    - Explore their attitude towards being involved in future research to test the use of an intervention to reduce secondhand smoke related harm
    - Explore their views on helping to disseminate study results

Closing

- End of the interview
- Check / clarify points back with the interviewee as necessary
- If they wanted to receive the results of the study explain when they should expect these by. If not, give them the option again

Appendix 5.16 A table to show the linkage and complexity of the inductive codes and their relationship with the pre-defined deductive codes with the COM-B model.

		Capability		**Opportunity**		**Motivation**	
		Physical	***Psychological***	***Physical***	***Social***	***Automatic***	***Reflective***
Capability: **Perception of HCP roles and responsibilities**	**Perception of HCP roles and responsibilities**	Skillset acquired as part of job role to apply to SHSe interventions	HCP's own awareness and knowledge of how the topic is relevant to their job role	Opportunities to intervene presented by HCP's job role			Confidence in their ability and intervene and the suitability of different job roles for intervention delivery
	Understanding of SHS		HCP's own awareness and				Confidence in knowledge

Capability: **Knowledge on the topic of SHS**			knowledge of SHS				
	Who's at risk and how to identify them?	Skillset to identify recipient for intervention and to start the discussion	HCP's own awareness of who might be at risk of SHSe				Confidence in skillset to identify and motivation to intervene
	Consequences of SHSe		HCP's own knowledge of consequences of SHSe				Confidence in knowledge and motivation to intervene
	Is SHSe a sensitive topic?	Skillset to navigate sensitive discussion	Awareness of potential sensitive nature of topic			Emotional reactions to intervention with a	Plan of how to approach and manage this sensitive topic

						potentially sensitive nature	
Capability: **Knowledge on the topic of SHS harm reduction**	**Understanding of SHS harm reduction**		HCP's own awareness and knowledge of harm reduction methods and importance of issue				Confidence in knowledge
	Awareness of and existing strategies to reduce SHSe at home	Skillset to deliver intervention	HCP's own awareness and knowledge of harm reduction methods and available options. Also,	Access to supporting resources	Access to supporting services		Confidence in knowledge and skillset to intervene. Also, motivated to include harm

			understanding of intervention components				reduction as an option in their patient management plan
	E-cigarettes or vapes		HCP's awareness and knowledge of e-cigarettes and vapes in relation to harm reduction				HCP's perception of e-cigarettes and vapes influencing their stance
Capability: **Acquisition of knowledge**	**Source of knowledge and training/ education**	Acquisition of skillset to intervene	HCP's level of acquired knowledge on topic of SHSe	Access to training and educational resources	Provision of training		Motivation to undertake training and self-confidence

							in their level of training
	Laws and campaigns		HCP's awareness of laws and campaigns around SHSe		HCP's encounter with laws and campaigns around SHSe		
Opportunity: **Access to opportunities which aim to support SHSe harm reduction**	**Access to opportunities which aim to support SHSe harm reduction**						
Opportunity: **Lack of supportive**	**Lack of supportive resources (i.e. time and funding)**			Lack of access to resources to			

resources (i.e. time and funding)				support intervention			
Opportunity: **Role and appointment type providing opportunity to intervene**	**Role and appointment type providing opportunity to intervene**	Nature of job role creates opportunities to intervene		Consultations done in job role are opportunities to intervene. Presentation of physical triggers and barriers to intervene	Influence of others encountered in job role affects HCPs' opportunity for intervention delivery		Motivation to use opportunities as part of job role to intervene
Opportunity: **How opportunity is affected by**	**Incentivisation by others to encourage SHSe intervention**				Incentives offered by anyone in relation to		Incentives to motivate HCPs to deliver intervention

HCPs' social environments	**delivery from HCPs**				intervention delivery		
	Effect of others' views around the professional expectations for HCPs				Influence of peer pressure		Sense of judgement
	Effect of third party				Presence of third party in consultation may affect intervention delivery or perceived receptivity of service user to	Emotional reactions or reasons not to intervene in response to seeing third party	Third party may influence motivation to intervene

					engage in intervention		
Motivation: **Guilt**	**Guilt**	Skillset to deliver intervention without making smoker feel guilty			Effect of others or social stigma on SHSe and effect of recipient feeling guilty	Emotions associated with guilt-trip	Perception of good and bad, feeling judged and HCP's plan to approach topic
Motivation: **Patient-professional relationship**	**Patient-professional relationship**				Influence of recipients on intervention delivery	Feelings on importance of relationship versus intervening	Is protecting relationship more important than intervening?

Motivation: **Beliefs about efficacy**	**Beliefs about efficacy**	Skillet to engage patients in intervention			Influence of recipients on intervention delivery	Feelings related to perceived uptake, engagement and outcomes	Beliefs and intentions for an intervention
Motivation: **Appropriateness**	**Perception of service user receptivity to intervention**	Skillset to engage patients in intervention			Influence of others to act as a barrier to intervention delivery	Emotional reactions or reasons not to intervene	Perception of good and bad, feeling judged and HCP's plan to approach topic
	Perception of job role	Skillset to engage patients in intervention	Knowledge of SHSe in remit of job role	Opportunities to intervene because of job role	Perceptions of their job role and their role		Intentions for intervening in relation to their

					in intervention delivery		view of job roles
	Are SHSe interventions needed?		Knowledge on topic of SHSe	Is intervening a priority in the consultation opportunities presented?			Is intervening a priority in the consultation opportunities presented?
Intervention: **Desired goal(s) from a SHS-related intervention**	**Desired goal(s) from a SHS-related intervention**		Awareness of important impact of SHS harm reduction and its benefits				Reason to deliver intervention
Intervention: **Delivered by whom?**	**Delivered by whom?**	Skillset through role influencing who best suited for	Knowledge learned through role influencing who best suited	Best opportunities to deliver an intervention	Support from other services in intervention delivery		Beliefs and intentions for an intervention will influence

		intervention delivery	for intervention delivery				delivery behaviors
Intervention: **Delivered to which groups of service users?**	**Universal approach**	Skillset to rise the topic in all consutlations	Knowledge of brief intervention	Consultation opportunities for intervention			Intentions for an intervention
	Medically relevant consultations		Knowledge of which patients to target	Consultation opportunities for intervention		Medical illness increase motivation to intervene	Intentions for an intervention
	Parents	Skillset to raise topic with parents	Knowledge of which patients to target	Consultation opportunities for intervention		Thought of child as a vulnerable group increases	Intentions for an intervention

						motivation to intervene	
	Smoking service users only	Skillset to identify smoking service users	Knowledge of which patients to target	Consultation opportunities for intervention			Intentions for an intervention
Intervention: **Recommended timing for intervention**	**Recommendations on the intervention intensity**			Consultation opportunities for intervention			Intentions for an intervention
	Recommended time points to intervene			Consultation opportunities for intervention			

	Time length for a single intervention			Consultation opportunities for intervention			Feeling pressured for time might influence motivation to deliver
Intervention: **What should a SHSe intervention include?**	**Recommendations for what the intervention should involve**	Skillset to deliver information	Knowledge of information to deliver				Planning and goal setting through intervention steps
	Supportive measures for implementation		Knowledge of where to signpost to		Access to supportive resources and services		

	Points that HCPs would like to learn in order to deliver an intervention	Gaps of skills to acquire	Knowledge gaps to fill		Provision of training		Level of confidence and reflection on knowledge and skillset to feel confident delivering an intervention
	Points that service users want to learn from an intervention				Influence of goals for smokers and their families etc. affecting intervention delivery		

Appendix 5.17 Suggested vignettes for a SHSe intervention based on qualitative data findings from the intervention theme

Table 7.1 Vignette number 1 - Indirect, broad, untargeted approach

1. Brief name	Vignette number 1 - Indirect, broad, untargeted approach
2. Why	Many HCPs, although keen to intervene on SHSe, reported difficulty in knowing who to deliver an intervention to and how to instigate discussion around SHSe. The topic of SHSe was considered by many HCPs to be a sensitive topic which might elicit defensive reactions from smokers, particularly smoking parents. A broad and untargeted approach would offer a conversation starter to help HCPs to raise the topic of SHSe with their patients. Moreover, patients might be encouraged to raise the topic themselves with HCPs when they felt ready to receive information and harm reduction advice after having seen a broadly advertised and untargeted message. Furthermore, the indirect, untargeted approach may alleviate HCPs' common fear that patients would view them as judgemental if they chose to discuss SHSe with a them.
3. What – material	Very brief advice educating on the harms associated with SHSe and the recommendations to reduce SHSe could be widely advertised in primary settings: posters and adverts (paper or electronic) in waiting rooms,

	leaflets distributed at each consultation, messaging on repeat prescriptions or appointment cards.
4. What – procedures	Staff working in primary care would be responsible to ensure these posters or adverts were visible and distributed. The recommended follow up support would need to be available should a patient wish to pursue the advertised recommendations. Free online training that has been shown to be effective should be made available to HCPs in primary care settings to enable them to answer any questions and provide advice to patients should SHS harm reduction messages be sought.
5. Who provided	Any member of the primary care team could help to distribute these messages. Management would need to approve and oversee the display of adverts in primary care settings, such as display of messages on TV/computer screens in patient waiting areas. Leadership (e.g. CCG) or professional bodies (e.g. RCGP) may be need to approve, distribute and facilitate the display of broad and untargeted SHSe harm reduction messages to encourage primary care teams to participate in these interventions.
6. How	The intervention would be delivered indirectly to primary care service users through advertised materials, described above (3). Further direct

	face-to-face further support would be provided to follow on from this intervention in successful cases.
7. Where	Waiting areas in primary care settings were felt to be an ideal setting to advertise harm reduction messages to a broad and untargeted audience. Messages may also be advertised in opportune places where patients are likely to see them, e.g. appointment reminder cards and repeat prescription scripts.
8. When and how much	Adverts and messages should be made available over a prolonged period of time to best reach as many patients as possible. Some HCPs gave the suggestion to opportunistically link with existing smoke free campaigns, such as Stoptober, to advertise the messages while discussion on smoking was already being encouraged at known and specified time points.
9. Tailoring	Adverts and messages may benefit from being adapted to the other languages and cultures in addition to English, to support patients of different backgrounds in understanding the harm reduction messages.
10. Modifications	N/A
11. How well – planned	Intervention uptake and engagement could be monitored by management within primary care teams, or via audits conducted by any promoters of this intervention i.e. CCGs or professional bodies. Alternatively, if a research team receives funding to test the feasibility of

	delivering SHS harm reduction intervention in primary care, they would also assess and report on how well this intervention was working in practice.
12. How well – actual	N/A

(N/A not applicable; CCG clinical commissioning group; HCP healthcare professional; SHS secondhand smoke; SHSe secondhand smoke exposure; RCGP Royal College of General Practitioners; TV television)

Table 7.2 Vignette number 2 - Direct, brief and untargeted approach

1. Brief name	Vignette number 2 - Direct, brief and untargeted approach
2. Why	The direct approach ensures that the harm reduction message is delivered to patients. Using an untargeted approach will avoid HCPs feeling judgemental for selecting whom to deliver this sensitive intervention to. Furthermore, delivering the message to all patients makes it easier for HCPs who sometimes feel it is difficult to identify and approach those at risk of SHSe. The brief messaging allows HCPs to remember a small script of points and questions which is succinct and easier to deliver in practice than a more complex intervention would be. Patients can then choose to follow up for further information at their own choice, which aligns with the patient voice of wanting to receive messages but often wishing to follow up when they were ready.

3. What – material	HCPs would need supportive resources or training to educate on what advice to offer and which questions to ask as prompts. Written resources (e.g. leaflets including practical advice) may also be given with this verbal intervention.
4. What – procedures	HCPs will offer information to all patients with whom they have a consultation. This information would offer very brief advice (to briefly explain the importance of avoiding SHSe and methods that can be used to reduce exposure, e.g. smoking outside with doors and windows closed) which forms the intervention being delivered to patients. Supportive services would need to be available for patients to access for further follow up support should they wish to access these.
5. Who provided	Any member of the primary care team could help to distribute these messages. A consistent approach from all members of the team would be recommended and would also be supportive to reinforce the message.
6. How	This intervention would be delivered face-to-face and may be reinforced with the provision of written material which can be taken away following a verbal conversation on the topic.
7. Where	The intervention would be delivered in all settings where a primary care HCP is offering professional service to patients: all primary care settings, including patients' homes on home visits.

8. When and how much	The brief advice would be delivered at every consultation by all HCPs in primary care, following the "Making Every Contact Count" guideline.
9. Tailoring	This is an untargeted intervention and therefore, will not require tailoring to the needs of individual patients. Should any written resources be used to follow on from the consultation detailing the key points, these may be tailored to suit the cultures and languages of patient populations registered at primary care practices.
10. Modifications	N/A
11. How well – planned	Intervention uptake and engagement could be monitored by management within primary care teams, or via audits conducted by any promoters of this intervention i.e. CCGs or professional bodies. Alternatively, if a research team receives funding to test the feasibility of delivering SHS harm reduction intervention in primary care, they would also assess and report on how well this intervention was working in practice.
12. How well – actual	N/A

Table 7.3 Vignette number 3

1. Brief name	Vignette number 3 - Layered intervention
2. Why	A consistent message delivered across primary care was recommended by most HCPs. However, some HCPs may be better suited in the role to offer further support to patients who show interest in the intervention to reduce SHSe.
3. What – material	No material needed for intervention delivery unless a written resource, e.g. leaflet, was wanted for distribution by all HCPs to support the broad untargeted message. All HCPs must be aware of where to signpost patients to for the next layer of the intervention. Furthermore, training will need to be provided to those HCP groups who will be responsible for offering further follow up support.
4. What – procedures	Broad, untargeted messages (similar to vignette number 2) would be delivered to all primary care service users. These can be followed up at the discretion of either the HCP or the service user by consulting with a HPC trained to support service users to reduce SHSe levels at home.
5. Who provided	All members of the primary care team would contribute to delivering the broad messaging to make use of every contact opportunity.

	Nurses, Health visitors, GPs, pharmacists and smoking cessation advisors would contribute to delivering patient-specific advice to support SHSe harm reduction. Referral to smoking cessation advisor may be deemed relevant for some patients.
6. How	This intervention would be delivered face-to-face and may be reinforced with the provision of written material which can be taken away following a verbal conversation on the topic.
7. Where	The intervention would be delivered in all settings where a primary care HCP is offering professional service to patients. The second layer of individualised intervention would need to be delivered in a confidential setting, such as a private consultation area.
8. When and how much	The brief advice would be delivered at every consultation by all HCPs in primary care, following the "Making Every Contact Count" guideline. Any further support would be offered once and then followed up as deemed necessary by the HCP.
9. Tailoring	The first part of the intervention will be an untargeted message and therefore not tailored to any particular patient. However, the second layer of the intervention will need to be tailored to the specific patient, so as to support them in changing home smoking behaviours to reduce the risk of harms caused by SHSe.

10. Modifications	N/A
11. How well – planned	Intervention uptake and engagement could be monitored by management within primary care teams, or via audits conducted by any promoters of this intervention i.e. CCGs or professional bodies. Alternatively, if a research team receives funding to test the feasibility of delivering SHS harm reduction intervention in primary care, they would also assess and report on how well this intervention was working in practice.
12. How well – actual	N/A

Table 7.4 Vignette number 4

1. Brief name	Vignette number 4 - Intervention targeted to population groups
2. Why	Some HCPs felt that harm reduction messages were only necessary to be delivered to particular populations (those in areas of high smoking prevalence, to parents, to identified smokers, to those presenting with a complaint relevant to smoking or SHSe).
3. What – material	Very brief advice educating on the harms associated with SHSe and the recommendations to reduce SHSe could be widely advertised in primary care settings which are based in communities that would be best to target with a SHSe intervention, e.g. areas of high smoking prevalence. Supportive resources or training to educate on what advice to offer and which questions to ask as prompts should also be made available to those working in areas or with service users deemed a target population. Written resources (e.g. leaflets) may also be given to support the broad untargeted message. All HCPs must be aware of where to signpost patients to for the next layer of the intervention. Furthermore, training will need to be provided to those HCP groups who will be responsible for offering further follow up support.
4. What – procedures	Broad, untargeted messages (similar to vignette number 2) would be delivered to all primary care service users.

	These can be followed up at the discretion of either the HCP or the patient by consulting with a HPC trained to support patients to reduce SHSe levels at home.
5. Who provided	All members of the primary care team serving populations of target would contribute to delivering the broad messaging to make use of every contact opportunity for these patient groups. Nurses, Health visitors, GPs, pharmacists and smoking cessation advisors would contribute to delivering patient-specific advice to support SHSe harm reduction. Referral to smoking cessation advisor may be deemed relevant for some patients.
6. How	This intervention would be delivered face-to-face and may be reinforced with the provision of written material which can be taken away following a verbal conversation on the topic.
7. Where	The intervention would be delivered in all settings where a primary care HCP is offering professional services to patients who are considered to be from a target patient population. The second layer of individualised intervention would need to be delivered in a confidential setting, such as a private consultation area.
8. When and how much	The brief advice would be delivered at every consultation by all HCPs in primary care, following the “Making Every Contact Count” guideline. Any

	further support would be offered once and then followed up as deemed necessary by the HCP.
9. Tailoring	Due to the targeted approach to delivery, the intervention can be tailored to particular patient groups, e.g. tailored to young mothers who smoke and expose their baby to SHS. The second layer of the intervention will need to be tailored to the specific patient, so as to support them in changing home smoking behaviours to reduce the risk of harms caused by SHSe.
10. Modifications	N/A
11. How well – planned	Intervention uptake and engagement could be monitored by management within primary care teams, or via audits conducted by any promoters of this intervention i.e. CCGs or professional bodies. Alternatively, if a research team receives funding to test the feasibility of delivering SHS harm reduction intervention in primary care, they would also assess and report on how well this intervention was working in practice.
12. How well – actual	N/A

Table 7.5 Vignette number 5

1. Brief name	Vignette number 5 - Patient-specific intervention
2. Why	A few HCPs felt that a complex intervention should be delivered specific to the patient to best support them to reduce SHSe for non-smokers in the home.
3. What – material	Training will need to be provided to HCPs offering this intervention to educate about identifying SHSe, raising discussion on this sensitive topic whilst protecting patient-professional relationships, and supporting changes in home smoking behaviours to help protect non-smokers from the consequences of SHSe.
4. What – procedures	Identified smokers and those identified to be at-risk of SHSe should be offered individualised support to help change home smoking behaviours to reduce levels of SHSe for non-smokers.
5. Who provided	Nurses, Health visitors, GPs, pharmacists and smoking cessation advisors would contribute to delivering patient-specific advice to support SHSe harm reduction.
6. How	This intervention would be delivered face-to-face to patients.
7. Where	The intervention would be delivered in all primary care settings where the relevant HCP was working. A confidential setting, such as a private

	consultation area, would be required for the delivery of a sensitive intervention to a specific patient.
8. When and how much	Support would be offered once and then followed up as deemed necessary by the HCP or as requested by the patient.
9. Tailoring	This intervention will need to be tailored to the specific patient, so as to support them in changing home smoking behaviours to reduce the risk of harms caused by SHSe. The intervention may need to be adapted to become language- or culturally-sensitive.
10. Modifications	N/A
11. How well – planned	Intervention uptake and engagement could be monitored by management within primary care teams, or via audits conducted by any promoters of this intervention i.e. CCGs or professional bodies. Alternatively, if a research team receives funding to test the feasibility of delivering SHS harm reduction intervention in primary care, they would also assess and report on how well this intervention was working in practice.
12. How well – actual	N/A

Appendix 6.1 Integration and synthesis of findings from the DeSSHaRM and DeSSIP studies, exploring HCPs' capability, opportunity, and motivation, to deliver SHSe interventions in UK primary care settings

	DeSSHaRM study	**DeSSIP study**
Capability	• Overall, only ~17% of respondents indicated they had a high level of capability to intervene around SHSe. • Most HCPs agreed or strongly agreed that they understood what the health effects of SHSe are. • There was a mixture of responses concerning whether the amount of training on SHSe was sufficient. • There was a mixture of responses regarding whether HCPs felt they could answer any questions about SHSe. • Most disagreed with the statement suggesting HCPs did not know how to ask smokers about SHSe for others present in their smokers' home environments (but there remained a large number of respondents who agreed or remained neutral in response to this posed statement).	• Perceptions of HCPs' roles and responsibilities - All in primary care have a responsibility to tackle SHSe - 'Making every contact count.' - Most feel training and skillset for role gives capability to intervene. - Part of the job to do health promotion activities - Everyone has a signposting role. - HCPs have the capability to give out informative leaflets. - GPs might have more capability if service users' motivation means they are more likely to listen to messages from GP rather than other HCP types. - Training on motivational interviewing given for job roles gives HCPs the capability to intervene around SHSe. - GPs feel HCAs and nurses likely to have more up-to-date training and knowledge on the topic of SHS because of their job roles - GPs had the capability to distribute information and refer service users for specialist support in reducing SHSe for others in home environments - An established part of the HVs job role to ask about SHSe for babies. - Capability overlaps with opportunity because of nature of job roles (pharmacists are easily accessible and can imbed intervention into existing MUR, NMS, nicotine replacement therapy and general sales consultations; nurses have longer consultations and see at-risk demographic in chronic disease management reviews which also improves the patient-professional relationship and therefore, motivation to intervene too)

	• Most disagreed with the statement that HCPs did not know how to support smokers to reduce the SHSe levels of those they live with. There were still many respondents who answered agree or neutral, though too.	• HCPs' knowledge on the topic of SHS - Can give vague definitions of SHS and many refer to passive smoking - Some confusion with thirdhand smoke influencing advice given by HCPs - Broad awareness of the topic but not confident in the level of knowledge - Children and partners most at risk of SHSe (those in the home with a smoker) - Aware of associated health risks. Most referred to respiratory complaints - Children, elderly and those with co-morbidities were considered at a high risk of developing the health effects of SHSe - SHSe generally viewed as a sensitive topic. Most HCPs wanted training to develop skillset on how to raise the discussion of SHSe in practice • HCPs' knowledge on the topic of SHS harm reduction - Most never heard of SHS harm reduction before the study - Most correctly interpreted a definition of SHS harm reduction based on their current knowledge base. - A desire for more information; knowledge of the subject and what HRMs will entail - Little knowledge of e-cigarettes and vapes or how these fit into harm reduction approaches - Understood the complexity surrounding SHSe interventions - Need different approaches for adults and children because the exposure scenarios are likely to be different for each - Confused how harm reduction messages would be different from cessation advice - Harm reduction message suggestions: smoking cessation, smoke in a different room, smoke less-tarry cigarettes, wear an overcoat, smoke outside, change smokers' mind-sets to encourage cessation, offer informative leaflets - Lack of confidence around harm reduction approaches indicates low capability. • Acquisition of knowledge about SHS

		- Little or no formal training or education had been delivered to HCPs about SHSe (particularly for GPs and pharmacists) - HCPs generally gained knowledge of SHS from their own school education and from national campaigns, or sometimes during paediatric training (in which case would have a gap in knowledge about adult SHSe cases) - Smoking cessation training delivered in undergraduate training, not sure if SHSe mentioned here - HVs had heard of SHSe in their job-specific training - All HCPs had an awareness of some laws or campaigns around SHSe (e.g. public smoking ban or TV adverts)
Opportunity	• Overall, only ~2% of respondents indicated they had a high level of opportunity to intervene around SHSe. (This was lower than capability and motivation results.) • The group of nurses and HVs had the highest mean score indicating the highest level of opportunity of all of the primary care HCP groups surveyed. • 42% of respondents felt it was easier to intervene around SHSe during follow-up appointments rather than first consultations, but there were still many respondents who answered neutral or disagreed on this. • A broad range of responses regarding feeling there was insufficient time to intervene, although the largest group was in agreement.	• Access to services supporting SHSe harm reduction - Most HCPs think of cessation as the method for harm reduction and therefore would make referrals to sources of specific smoking cessation support to effect SHS harm reduction - Depending on the level of motivation, often contingent on perceived capability, HCPs will refer service users to another HCP type for support with SHS harm reduction • Lack of supportive resources (i.e. time and funding) - Pressures on time and funding; competing priorities of other medical and social problems as well as patient's agenda for consultation compounded by a lack of supportive resources – all reduce opportunities to intervene - Access to supportive services and resources much more limited than before because of these such funding restrictions, so fewer opportunities available - More funding and resources are wanted and seen to be an investment. • Role and appointment type providing opportunity to intervene - Primary care consultations believed a better setting to address SHSe than secondary care consultations. - GPs think nurses have more smoking cessation training, good skillset, longer and more frequent consultations and more specific appointments to target appropriate service users in - GPs think HCAs have more time with patients to deliver any complex interventions.

	• An equal divide of respondents agreeing and disagreeing that they would only intervene if SHSe was causing or worsening a medical condition. • Nearly half (49%) HCPs agreed SHSe is often a lower priority as smokers have other problems that needing addressing. There was a range of responses, but no-one strongly disagreed with this statement. • Only ~20% agreed they felt well supported to intervene with smokers to help them reduce SHSe.	- All HCPs should have some opportunity and skillset to 'make every contact count.' - Most felt HCPs who make home visits have the best opportunity to intervene because it is easier to identify SHSe, and they would also be likely seeing groups of service users with the highest risk of SHSe harms. For example, HVs see children under 5 years who maybe live with smokers. - Pharmacists have the opportunity to give lifestyle advice and health promotion as part of their normal activities and patient consultations. • How opportunity is affected by HCPs' social environments - No incentives offered to encourage HCPs to intervene around SHSe; health benefits are seen as the only incentive; some incentives were identified for smoking cessation, particularly for pharmacies who offer a specific service and generate revenue for it, or for GP practices through QOF points achieved when staff ask about service users' smoking status. - Campaigns encouraged by professional bodies create a social opportunity to intervene. However, these do not exist specifically for SHSe as yet. Thus, more encouragement is needed from leadership or from membership bodies to incentivise and create opportunities for SHS interventions. - The presence of a third party can influence intervention delivery. Most HCPs were more likely to intervene if a child was present regardless of whom the consultation was focussed on. Similarly, HCPs were more likely to intervene around SHSe for an adult service user if their smoking partner was also present in the consultation to account for the agency to affect change in home smoking habits
Motivation	• Overall, only ~16% of respondents indicated they have a high level of motivation to intervene around SHSe. (This was lower than capability but higher than opportunity data.) • Respondents from the HCP group type 'Other' had lower mean scores for motivation than GPs.	• Guilt - HCPs expected that smoking service users would feel guilty and react defensively - HCPs wanted to avoid making smokers feel guilty do not want to lose patient other health issues too important - Not confident on how to support parents on a sensitive topic that will make them feel guilty - Only one HCP suggests guilt can be a tool to help change smoking behaviours

	• HCPs based in the community setting reported lower adjusted mean scores than those based in primary care (i.e. GP practices) settings. • Most HCPs agreed that intervening to help smokers to reduce SHSe for others is important. No HCP strongly disagreed with this statement, and only ~2% indicated that they disagreed at all on this. • There was an uncertainty of whether smokers wanted support from HCPs. Indeed, ~46% remained neutral on this. • Most HCPs said they would feel uncomfortable intervening with smokers to help reduce SHSe for others. Over half agreed with this statement and of these, ~15% were in strong agreement about this. • Most disagreed with the statement that raising the topic of SHSe would create problems for patient-professional relationships.	• Patient-professional relationship - Build, maintain and protect relationship takes precedence over SHSe interventions for all HCPs - If service user were upset, they might not come back and so, miss out on other priority issues to address (medical problems and QOF) - All GPs wanted to avoid being paternalistic and did not want to nag or lecture service users as they were scared this would damage the relationship - Only one says challenging the relationship can motivate patients to change smoking behaviours but still did not want to nag or lecture and wanted to keep the relationship ultimately - Already have a lack of relationship and sporadic opportunities to intervene so this lack of relationship can be demotivating to intervene and presents a barrier for delivery and follow up of SHSe interventions • Beliefs about efficacy - Some have a positive view of uptake and outcomes; parents want to do what is best for the child - A belief that the planting of a seed of intervention idea will be effective and have a big impact for many - An appreciation that harm reduction might work better for those not ready to quit - HCPs have more motivation to intervene with younger service users who smoked as they felt younger smokers were more likely to change behaviours in response to an intervention - HCPs felt there would be better uptake of intervention delivery if the intervention was brief and succinct and also relevant to the consultation - HCPs suggested that earning a certificate or CPD accreditation would increase motivation and therefore, uptake - Some HCPs were worried that an intervention might annoy the service user and cause them to lose contact with the service or potentially put a strain on

	• ~45% HCPs agreed that smokers would not engage in SHSe interventions (of these, 4% were in strong agreement). A further 38% HCPs remained neutral on this indicating some uncertainty.	the service user's personal relationships. These beliefs demotivated HCPs from intervening - HCPs were less motivated to offer interventions if they believed service users would not engage in the intervention or would not believe their advice - Some HPCs felt that an intervention would only be effective if the service user was ready to listen to the advice given (whereas other believed in the effectiveness of 'planting the seed' for those not ready) - Some HCPs had a higher motivation for cessation options rather than harm reduction intervention delivery as they felt this would have a better impact on health • Appropriateness - Will service users be receptive and engage: good level of public awareness of smoking harms makes service users more likely to engage; if a HCP felt service user was receptive to an intervention, then they were more likely to intervene; service users would be more likely to be receptive if medial illness or if given by HCP with whom they had a good relationship – these factors all increase HCPs' motivation to intervene; HCPs were less motivated if they felt they still needed to build a relationship first (i.e. not deliver the intervention in the first consultation); HCPs were demotivated to intervene if they felt it was not appropriate because the service user might disengage with services or had not responded to previous interventions; HCPs were demotivated to intervene if the service user's own agenda limited the chance to intervene or if the HCP judged that the service user did not have the agency to act upon intervention advice - Is it part of HCPs job role: it was felt to be everyone's job role so HCPs were motivated because of 'every contact counts'; GPs felt it was a core part of job role; HCPs' view that an intervention could be simple if asking about and recording SHSe as part of job role showed optimism and thus motivation; HCPs seeing the same service user overtime in their job role were more motivated to intervene and opposite was true if there was a lack of relationship; the demands of HCPs' roles meant they had little opportunity to intervene which also lowered motivation to intervene; some HCPs felt others had better opportunity or capability which then demotivated themselves; some HCPs felt

		that preventative medicine was a luxury in their job role and that other problems would take priority; some HCPs may have their own particular interest or area of specialism and so they would have a lower motivation for SHSe intervention delivery in comparison; if the HCP could not give follow up advice and support they felt embarrassed and less motivated to follow up at all - Is an intervention needed: most recognise SHSe is still an issue; HCPs felt intervening on SHSe was the right thing to do; they felt the intervention was more important when at the point of diagnosis, so HCPs felt more motivated to intervene then; some HCPs were motivated to raise the topic but had less motivation to follow up on the initial discussion; HCPs would assess appropriateness to decide if an intervention was needed in each consultation, other topics may take priority as having a higher need to be addressed than SHSe.