STOP SMOKING INEQUALITIES

A SYSTEMATIC REVIEW OF SOCIOECONOMIC INEQUALITIES IN EXPERIENCES OF SMOKING CESSATION INTERVENTIONS IN THE UK

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CANCER RESEARCH UK

REFERENCE

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AUTHORS

Caroline Smith, Sarah Hill, and Amanda Amos

University of Edinburgh

CANCER RESEARCH UK

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ACRONYMS

ASH – Action on Smoking and Health

CRUK – Cancer Research UK

IMD – Index of Multiple Deprivation

MSSS – Mobile Stop Smoking Service

NIMDM – Northern Ireland Multiple Deprivation Measure

QOF – Quality and Outcomes Framework

PQAR – Population Quit Attempt Rate

PQSR – Population Quit Success Rate

SIMD – Scottish Index of Multiple Deprivation

SSS – Stop Smoking Service

FOREWORD

The UK had the highest rates of smoking in the world in the post-war period, but the gradual introduction of effective tobacco control measures has resulted in encouraging declines. Today smoking rates in the UK are the second lowest in Europe and the UK is recognised as a global leader in tobacco control. However, this success masks considerable inequalities.

Smokers from more deprived communities in the UK disproportionately bear the burden of the health harms of combustible tobacco use. These include an increased risk of 15 types of cancer along with a range of other chronic conditions. The cost of smoking perpetuates poverty for families and individuals, and accounts for around £2 billion per year in avoidable NHS expenditure.

These inequalities are the focus of this new report from Cancer Research UK, authored by researchers at the University of Edinburgh. The report provides a comprehensive review of the relationship between socio-economic status (SES) and smoking and the use of stop smoking services. It includes a systematic review of existing literature on how smokers from lower SES groups access stop smoking services and the outcomes from service use. It also provides important insights into the role of services in addressing inequalities and provides a framework for understanding how services can be positioned and supported in future to help more smokers to quit. Findings are placed in the context of increased pressure on NHS and local authority funding while emphasising the importance of public health and prevention.

The authors reviewed the most recent data, demonstrating that the social gradient in smoking remains, despite overall declines in smoking prevalence at the population level. There has been no reduction in inequalities in smoking in the UK, except in Scotland. Stop smoking services have been accessed by far fewer smokers than in the past, linked to cuts in funding for services and fewer mass media campaigns. In England, services have moved from the NHS to local authorities which may have contributed to reduction in client numbers.

Smokers from deprived communities are more likely to access stop smoking services, but when they do, they are less likely to be successful in their quit attempt than more affluent smokers. This is the case across the UK. However, in Scotland, national health targets focused on quit success in deprived communities have compensated for lower success rates by attracting a higher proportion of lower SES smokers than in other parts of the UK, contributing to positive equity outcomes.

The report makes clear that stop smoking services still have a vital role to play as part of comprehensive tobacco control. They are lifesaving services for smokers seeking help to quit, and could play an important role in reducing inequalities in health with appropriate and ongoing funding and support.

Professor Linda Bauld
Director of the Institute for Social Marketing, University of Stirling and Cancer Prevention Champion, Cancer Research UK

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EXECUTIVE SUMMARY

BACKGROUND

Smoking is the single biggest cause of preventable illness and avoidable death in the world.[1] It is also the leading cause of socioeconomic inequalities in health in the UK and accounts for around half the difference in life expectancy between the richest and poorest groups.[2 3] In the UK, adults from deprived backgrounds are more likely to smoke and they thus bear the burden of health impacts disproportionately.

Stop Smoking Services (SSS), which deliver specialist behavioural support with pharmacotherapy to help people quit smoking, have played an important role in reducing smoking rates.[4] However, there has been a substantial decline in quit attempts through SSS. This reduction of provision and uptake of SSS across the UK can be linked to cuts to the Public Health Grant. In England, where SSS are commissioned by local authorities, half of all local authorities cut funding for SSS in 2017.[5] Some local authorities have decommissioned their services altogether.

Reducing health inequalities is a key priority for all four UK nations. With SSS under increasing pressure, it is critical to understand how services can be best designed and delivered to ensure that the UK can tackle the health inequalities caused by smoking.

KEY FINDINGS

INEQUALITIES IN SMOKING RATES HAVE NOT REDUCED IN THE U.K.

There has been no overall reduction in smoking inequalities in the UK in recent years. A similar picture is seen in the individual UK nations, with the exception of Scotland.

FEWER PEOPLE ARE USING STOP SMOKING SERVICES

Since 2012, across the UK, fewer smokers are attempting to quit with the support of SSS. This reduction has been most marked in England, which may be explained by the move of SSS commissioning from the NHS to Local Authorities, making it harder to refer patients from the NHS to these services.

Scottish SSS now help proportionately more smokers to quit than the English SSS, a reversal of previous trends. The decreasing uptake of SSS by smokers has limited their contribution to reducing smoking prevalence and health inequalities in the UK.

LOWER SES SMOKERS ARE MORE LIKELY TO USE STOP SMOKING SERVICES BUT ARE LESS LIKELY TO QUIT

Smokers from lower socioeconomic status (SES) backgrounds are more likely to access an SSS, but are less likely to be successful in their quit attempt, due to the additional barriers they face to quitting. These include higher levels of dependence, positive or accepting social norms around smoking and difficult or challenging life circumstances including disadvantage.

SCOTLAND HAS HAD SUCCESS IN REDUCING INEQUALITIES IN SMOKING

In 2011, Scotland introduced a national SSS equity-based target, which was refined in 2014. Since 2011, Scottish services have helped relatively more low SES smokers to quit. The deliberate targeting and attracting of high numbers of low SES smokers by SSS seems to more than compensate for low SES smokers' relatively low quit rate, thus helping to reduce health inequalities.

HEALTH SERVICES HAVE AN IMPORTANT ROLE TO PLAY

The wider NHS also plays an important role in addressing health inequalities. This study shows that primary care and maternity services can be important in offering quit support directly and increasing

referrals of low SES smokers to SSS, therefore increasing the number of low SES smokers that quit.

INNOVATIVE INTERVENTIONS CAN SUPPORT DEPRIVED SMOKERS

Several promising interventions have been used to support low SES smokers in their quit attempt: for example, financial incentives, tailored advice matched to literacy levels, and mobile or outreach services. These hold the potential to increase the chances of low SES smokers being successful in their quit attempt.

THE FULL POTENTIAL OF STOP SMOKING SERVICES HAVE YET TO BE REACHED

There is considerable variation in the impact of SSS in the UK, in terms of both reach and quit rates. While SSS are uniquely placed to support smokers to quit, the continuing decline in quit numbers and rates indicates that their full potential has yet to be achieved.

POLICY RECOMMENDATIONS

Given the potential that SSS have to reduce health inequalities caused by smoking, it is important that national and local governments invest in them and support them to target and tailor their offering to smokers from lower SES groups. Cancer Research UK is calling for:

The UK Government to:

- Reverse cuts to the Public Health Grant, to prevent further budget cuts to tobacco control and SSS in England
- Find a sustainable solution for funding SSS in the long term, including ensuring that the tobacco industry makes a greater contribution to the healthcare costs caused by smoking

Local Authorities in England to:

- Prioritise and sustain funding for tobacco control including SSS
- Support SSS in adopting a targeted approach to reach low SES smokers in the local area, and thereby increase uptake of SSS
- Work with health services, including primary care and maternity services, to develop referral pathways between the NHS and SSS for low SES smokers
- Implement monitoring and evaluation of the above measures in line with NICE guidance NG92

The Scottish Government to:

- Ensure local and national levels of investment in Quit Your Way services are at least maintained for the duration of Scotland's five-year Tobacco Control Action Plan
- Monitor and evaluate the growth, effectiveness and reach of Quit Your Way as a brand for SSS among lower SES groups

The Welsh Government to:

- Work with local health boards to collect data on the socio-economic status of people who use Help Me Quit to make a quit attempt, and incorporate reporting of these into NHS smoking cessation service statistical releases

The Northern Ireland Department of Health to:

- Recognise the value of targeted approaches to lower SES groups in the mid-term review of its 2012-2022 Tobacco Control Strategy
- Commit to at least maintaining levels of funding in SSS for the remainder of the strategy

METHODOLOGY

Cancer Research UK commissioned the University of Edinburgh to carry out a systematic review of the evidence on socioeconomic inequalities in experiences of smoking cessation interventions in the UK. The research aimed to increase the understanding of how SSS can be best designed and delivered to reduce inequalities in smoking. Forty-three papers published between 2012 and 2017 were included in the review and data from national stop smoking surveys (2012-2017) were analysed to identify trends in smoking and inequalities.

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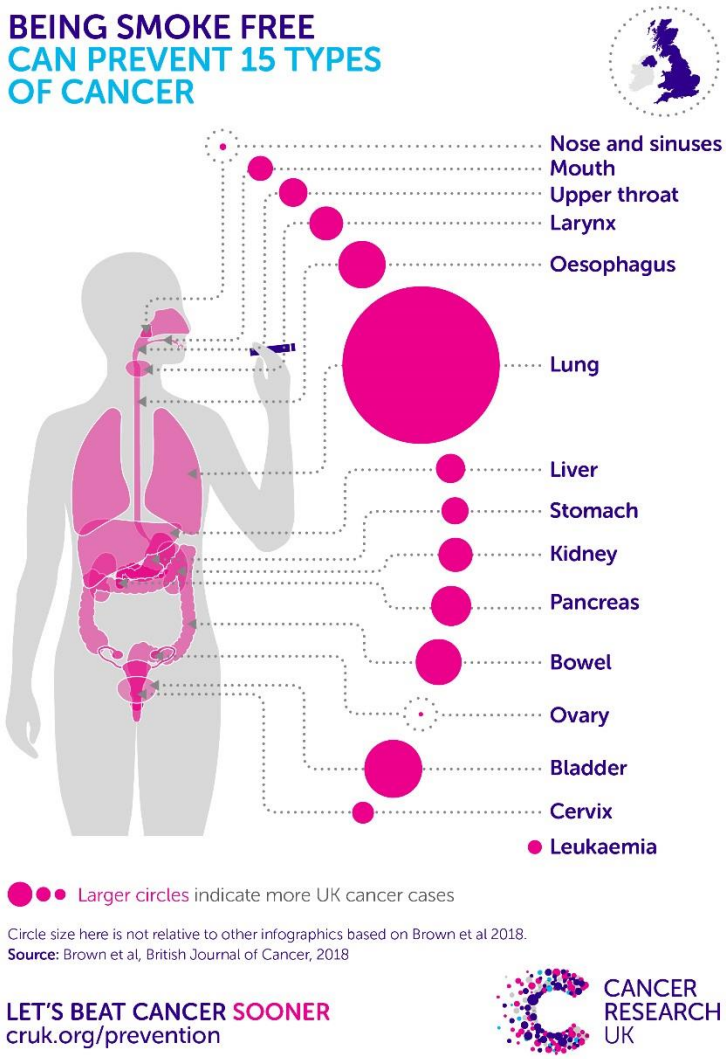
CONTENTS

1 INTRODUCTION

Smoking is the single biggest cause of preventable illness and avoidable death in the world (World Health Organisation, 2018), accounting for 115,000 deaths per year (Peto, 2015). It is associated with least 15 different types of cancers and caused around 54,300 cases of cancer in the UK in 2015 (Brown, 2018). More than 7 in 10 (72%) of all lung cancer cases are a result of smoking (Brown, 2018), and lung cancer survival is among the lowest of all cancer types (Quaresma, 2015). It is estimated that the cost to the NHS of treating smoking related illnesses in England alone is approximately £2bn a year (ASH, 2017)



Smoking is also the leading preventable cause of premature mortality and socioeconomic inequalities in health across the UK, accounting for around half the difference in life expectancy between the richest and poorest groups (Scottish Government, 2013; Department of Health, 2017). While recent years have seen a significant decline in smoking prevalence in Great Britain across all socioeconomic groups, the social gradient in smoking remains (ONS, 2018). Data from 2017 shows that in the UK, smoking prevalence among routine and manual occupations was over twice as high as that among managerial and professional occupations (26% vs 10%) (ONS, 2018. In Scotland in 2016 adults living in the most deprived areas (SIMD 1) were nearly three times as likely to be smokers as those living in the most affluent areas (SIMD 5) (32% vs 12%) (Bardsley et al, 2017).

The recently launched Tobacco Control Plan for England identifies cutting smoking inequalities at the national and regional level as one of its key goals (Department of Health, 2017). Similarly, the 2013 Scottish strategy put reducing socioeconomic inequalities in smoking at the heart of its aim to create a tobacco-free Scotland by 2034, setting five-year smoking prevalence milestones based on deprivation (SIMD) quintiles to achieve this (Scottish Government, 2013). The 2018 action plan seeks to build on the progress that has been made so far, with a continued focus on social, economic and health inequalities (Scottish Government, 2018). In the Northern Ireland tobacco control strategy,

disadvantaged smokers are one of three priority groups identified for more focused action (DHSSPSNI, 2012), and the Welsh action plan aims to reduce smoking prevalence among the three highest quintiles of deprivation at a faster rate than among quintiles one and two (Welsh Government, 2012). All these national strategies highlight the importance of targeting cessation support to disadvantaged communities to reduce the inequalities gap. However, a recent analysis by ASH Scotland shows that, despite declines in adult smoking across all deprivation levels in Scotland over the past ten years, smoking is becoming increasingly concentrated in the most disadvantaged groups, suggesting that the Scottish 2034 target will not be reached unless greater progress can be made among the poorest groups (ASH, 2017).

Providing evidence-based smoking cessation support plays an important role in reducing adult smoking prevalence (Kotz et al, 2014). However, a systematic review of smoking cessation support in Europe between 1990 and 2013 (Brown et al, 2014) found that, irrespective of the type of support provided, no cessation intervention produced higher quit rates in low socioeconomic status (SES) smokers compared to high SES smokers. Indeed, the majority of studies found the opposite (i.e. higher quit rates in high SES smokers). However, two national studies of UK NHS stop smoking services (SSS) included in the review showed an overall positive equity effect in that, as they were targeted to low SES smokers, the higher reach (uptake) in this group more than compensated for their lower quit rate (Galbraith and Hecht, 2012; Bauld et al 2007). In other words, by focusing recruitment on low SES smokers these services produced a net positive equity impact at a population level (that is, a higher proportion of all low SES smokers compared with all high SES smokers were able to quit via the support of SSS).

Since the 2014 review there have been significant changes in the provision and uptake of stop smoking services in the UK. In England, the move of SSS from the NHS to local authority control at a time of budget cuts has impacted negatively on the provision of such services: in 2017, half of all local authorities cut funding for SSS, and some have decommissioned their service altogether. (CRUK, 2018). In addition, the past few years have seen a decline in the number of smokers using these services across the UK (NHS Digital, 2016). This trend may be attributed to several factors, including falling levels of investment in SSS and mass media campaigns due to wider constraints on public spending and a reorganisation of public health services in England (CRUK, 2016; Reid et al, 2017).

Ever since the SSS were established in the UK, it has been recognised that there is considerable variation in the impact of these services, in terms of both reach and quit rates. It has therefore been argued that SSS could learn from each other in order to optimise their impact; yet the continuing decline in quit numbers and rates found in this review indicates that the full potential of SSS has yet to be achieved. As such, it is particularly important – especially in this challenging context – that we have a better understanding of how SSS can be optimally targeted and delivered to reduce inequalities in smoking.

This report presents the findings of a national equity analysis of the impact of the NHS stop smoking services, together with a systematic review of the evidence on socioeconomic inequalities in experiences of UK smoking cessation interventions more generally. To reflect the changing environment in which these services and interventions operate, only evidence published since 2012 was included for review. The report concludes by considering the potential for specific types of cessation interventions to reduce inequalities in smoking in the UK, and by discussing the implications for future policy, practice and research.

2 RESEARCH AIMS

The aims of this study were:

a) To describe the extent of current socioeconomic inequalities in smoking prevalence at both UK and national (England, Northern Ireland, Scotland, Wales) levels.
b) To assess the impact of existing NHS Stop Smoking Services on socioeconomic inequalities in quit attempt and quit success rates.
c) To identify, critically appraise and synthesise academic and grey literature published since January 2012 on socioeconomic experiences of cessation support in the UK, looking both at:
   - the equity impact of interventions for which evidence was presented by SES; and,
   - the effectiveness of interventions targeted at lower SES groups.
d) To reflect on those interventions and measures which may help to reduce socioeconomic inequalities in cessation support in the UK.
e) To consider the implications of these findings for future policy, practice and research.

3 METHODS

3.1 SOCIOECONOMIC INEQUALITIES IN SMOKING ACROSS THE UK

A range of national surveys (described below) provide estimates of smoking prevalence in UK adults by socioeconomic group, with each survey varying according to sample size, geographical coverage and type of SES measure used. Data from these different surveys were brought together to explore patterns and trends in SES inequalities in smoking across the UK as a whole and within the four constituent nations.

- *Annual Population Surveys (APS)* – a continuous household survey of around 320,000 households each year in the UK, covers adults aged 18 years and above. It does not routinely publish smoking and SES analyses (ONS 2017e).
- *Opinions and Lifestyle Survey (OPN)* – covers around 2,000 households a month in Great Britain and includes adults aged 16 years and above. It contains a wider range of smoking-related questions than APS. It also publishes more detailed analyses of smoking in England (ONS 2017c, 2017d).
- *Health Survey for England (HSE)* – an annual survey of around 8,000 adults (16+) and 2,000 children. Includes cotinine testing to assess validity of self-reported smoking status (NHS Digital 2016).
- *Scottish Health Survey (SHeS)* – an annual survey of around 4,300 adults (16+) and 1,500 children. It is used by the Scottish Government to provide official smoking estimates and track progress against national targets. Includes cotinine testing to assess validity of self-reported smoking status (Bardsley et al 2017).
- *Northern Ireland Health Survey (NIHS)* – an annual survey covering around 3,900 people aged 16 years and above. Used to provide official smoking estimates and track progress against national targets (Scarlett and Denvir 2016).

- *National Survey for Wales (NSW)* – an annual survey covering around 10,000 people aged 16 years and above. Used to provide official smoking estimates and track progress against national targets (Welsh Government 2017).

3.2 NATIONAL EQUITY ANALYSIS OF NHS STOP SMOKING SERVICES

Annual national statistic releases for the NHS stop smoking services contain data on SSS-supported cessation attempts. Online searches found 25 such reports and workbooks published since 2012. These were reviewed to identify any SES data and to compare information available across the four UK nations. Only two reports covered services in Wales (one for 2012 and one for 2013), neither of which presented data by SES. The remaining 23 publications were collated to produce summary reports for England, Scotland and Northern Ireland. As the national statistic releases typically contained time series data extended for several years before the date of publication, we were able to include data for the time period 2009-2017 (2016 for Northern Ireland). Service-level analyses of SSS equity impact focused on the number of quit attempts made with an SSS and on short-term quit rates at four weeks, since these two measures were reported by all three countries for a minimum of five years. While data on three-month quit rates were only available for Scotland, these were also extracted and analysed as they provide useful information on socioeconomic differences in quit success rates in the medium-term.

Beyond these service-level analyses, we also looked to assess the population-level impact of the SSS. Here, two main outcome measures were used: the population quit attempt rate and the population quit success rate (see Box 1 for definitions). First, the overall SSS population-level impact was assessed by combining data on SSS-supported quit attempts and quit successes with estimates of the total smoker population. For Scotland, estimates of the number of smokers were taken from the latest SSS annual statistics release (ISD, 2017); for England and Northern Ireland, smoker numbers were calculated by merging annual mid-year national population estimates (ONS, 2017; NISRA, 2016) with survey-based estimates of smoking prevalence (ONS, 2017b; Corrigan & Scarlett, 2017).

BOX 1: DEFINITIONS OF POPULATION-LEVEL IMPACT MEASURES

Population quit attempt rate:	proportion of all smokers who make a quit attempt with an NHS stop smoking service
Population quit success rate:	proportion of all smokers who make a successful quit attempt with an NHS stop smoking service

Next, attempts were made to explore the population-level equity impact of the stop smoking services by comparing the population quit attempt rate (PQAR) and the population quit success rate (PQSR) across the lowest and highest SES groups. In Scotland, national statistics releases for the SSS use the Scottish Index of Multiple Deprivation or SIMD (Scottish Government, 2016) as the main measure of socioeconomic status. The most recently available report for the Scottish services (ISD, 2017), moreover, contained estimates of smoker numbers by SIMD, allowing us to directly calculate PQARs and PQSRs for each deprivation category. As equivalent data were not included in the performance monitoring reports for the English and Northern Irish services, we instead investigated the possibility of generating SES-level estimates of smoker numbers from other national data sources in order to undertake population-level equity impact analyses for the SSS in these two countries.

3.2.1 POPULATION EQUITY IMPACT: METHODS FOR ENGLAND

In contrast to Scotland, the national reports for the English SSS use NS-SEC occupational group (ONS, 2016) as the primary indicator of SES. We, therefore, sought to estimate the number of smokers by occupational group in England by combining national mid-year population estimates (ONS, 2017) with census data on the proportion of the population falling into each occupational group (NOMIS, 2017) and with smoking prevalence estimates by NS-SEC from the Annual Population Survey (ONS, 2017b).

Difficulties were, however, encountered in attempting to bring together these estimates of smoker numbers and the SSS performance monitoring data. More specifically, the 2011 census allocated all individuals to one of four main occupational groups: managerial and professional, intermediate, routine and manual, and those who have never worked (including students) or who are long-term unemployed. Other groups, such as those who have retired, were assigned to one of these categories on the basis of their last occupation. The SSS coding system, in contrast, does not attempt to reallocate the other groups but rather classifies them as either retired, unpaid home carers, prisoners, or unable to work through sickness or disability. Alongside this, approximately 10% of stop smoking service clients could not be assigned to an occupational group (no further details were supplied). As a result, a sizeable proportion of SSS clients (over a third) could not be mapped on to one of the occupational groups used in estimating the number of smokers (Table 1).

TABLE 1: DISTRIBUTION OF ENGLISH STOP SMOKING SERVICE CLIENTS BY OCCUPATIONAL GROUP (%), 2012/13-2016/17

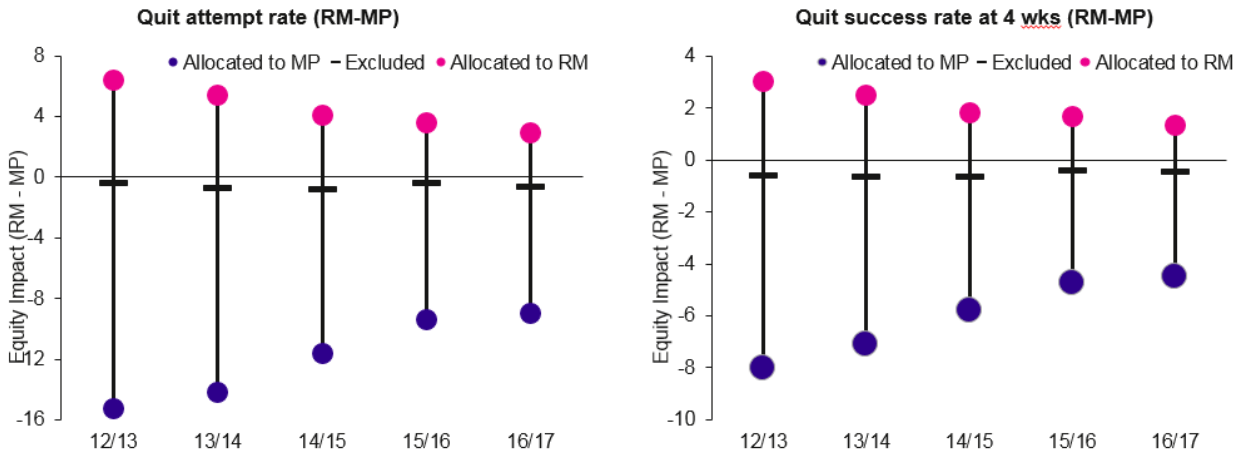
	12/13	13/14	14/15	15/16	16/17
Managerial & professional	11.2	11.0	11.1	11.6	11.3
Intermediate	7.8	7.4	7.7	7.6	7.7
Routine & manual	24.5	23.7	24.3	26.0	26.5
Never worked & long-term unemployed/students	19.3	18.6	18.1	17.6	16.8
Other	25.1	25.5	27.1	28.3	28.8
Not known	12.1	13.7	11.7	8.9	8.8

The resultant SES-based PQARs and PQSRs for England are, therefore, underestimates, as individuals from these other occupational groups will appear in the estimated number of smokers (the denominator) but not in the number of quit attempts/successes (the numerator). As it is not possible to determine to what extent this underestimation will vary by occupational group, a sensitivity analysis was undertaken to assess the likely robustness of the equity impact analysis. Here, PQARs and PQSRs were calculated in three different ways, with clients whose occupational group was coded as other or not known being handled as follows: (a) excluded from the analysis; (b) allocated to the managerial and professional group; or, (c) allocated to the routine and manual group (i.e. the lowest occupational group).

The equity impact of the English SSS was then estimated by subtracting the PQARs/PQSRs for the managerial and professional groups from those for the routine and manual workers, using each of these three different methods to produce a range of possible equity impact scores. While this approach is highly conservative (it is extremely unlikely that the other/not known group will all

belong to one occupational group), it is the best that can be achieved with the available data. From Figure 1, it can be seen that excluding the other/not known group from the analysis produces a marginally equity negative result in relation to both quit attempts and quit success. Allocating all such clients to the managerial and professional occupational group leads to a strongly equity negative effect, whereas allocating them all to the routine and manual group gives an equity positive effect. Thus, due to differences in the recording of occupational status across the underlying data sources, it is not possible to draw any conclusions about the likely direction of the equity impact of the English stop smoking services.

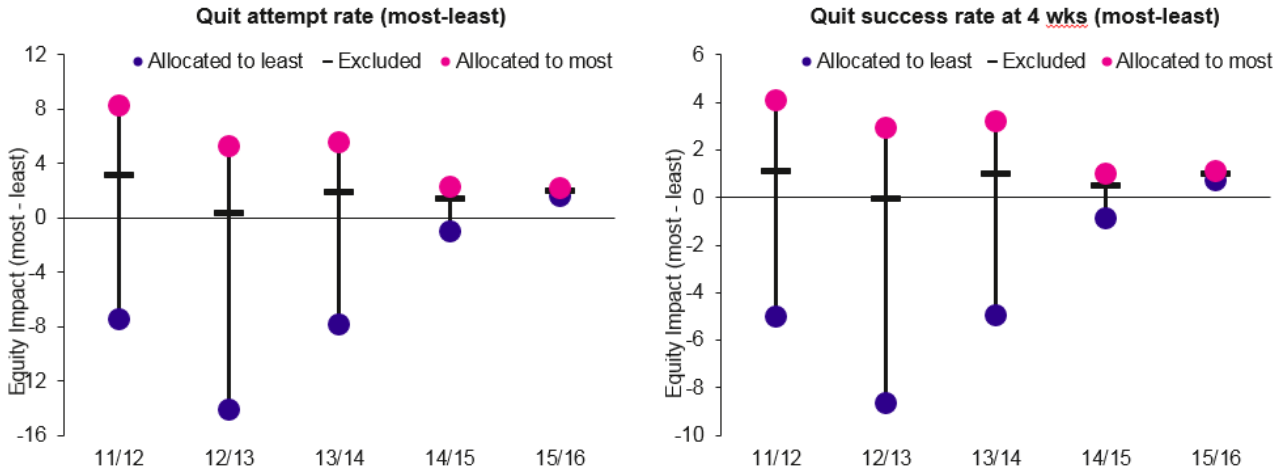
FIGURE 1: SENSITIVITY ANALYSES FOR EQUITY IMPACT OF ENGLISH STOP SMOKING SERVICES



3.2.2 POPULATION EQUITY IMPACT: METHODS FOR NORTHERN IRELAND

SSS performance monitoring reports for Northern Ireland used an area-based measure of disadvantage, namely the NI Multiple Deprivation Measure (NISRA, 2017). Here, it was possible to estimate the number of smokers in each deprivation quintile by first combining the NIMDM deprivation rankings (NISRA, 2017b) for each super output area (SOA) with the population estimates for these areas (NISRA, 2016) and then summing across each NIMDM quintile to produce population estimates by deprivation, for the years 2011/12 to 2015/16. NIMDM-level smoking prevalence rates from the NIHS (Corrigan & Scarlett, 2017) were then applied to these population estimates to obtain the number of smokers within each deprivation quintile. These estimates were, in turn, combined with the SSS data to calculate PQARs and PQSRs by level of deprivation. As with English SSS data, there were some issues with missing NIMDM data for the SSS clients, although this became less of a problem over the five-year period, as the proportion of clients whose NIMDM score was not known fell from 13.9% in 2011/12 to just 0.8% in 2015/16. As a result, analysis of equity impact was approached in the same way as for the English SSS. Clients with missing NIMDM data were handled in three different ways (excluded, allocated to the most deprived group, or allocated to the least deprived group), leading to a (conservative) range of possible estimates for the population quit rates.

FIGURE 2: SENSITIVITY ANALYSES FOR EQUITY IMPACT OF NORTHERN IRISH STOP SMOKING SERVICES



Here, there was slightly more variation in the PQARs and PQSRs over time (Figure 2), reflecting the smaller population of Northern Ireland (and hence the smaller number of smokers). Overall, when clients with missing deprivation data were excluded from the analysis, the Northern Ireland services were seen to have a positive impact on both quit attempts and quit success at all time points (with the exception of the PQSR in 2012/13). The high proportion of cases with missing NIMDM data between 2011/12 and 2014/15 resulted, however, in a wide range of possible values, making it difficult to be certain about the equity impact of SSS during this period. In contrast, recent improvements in the availability of NIMDM data allow us to conclude that the stop smoking services in Northern Ireland did have a positive equity impact on both PQARs and PQSRs in 2015/16.

3.3 SYSTEMATIC REVIEW OF SOCIOECONOMIC INEQUALITIES IN CESSATION SUPPORT IN THE UK

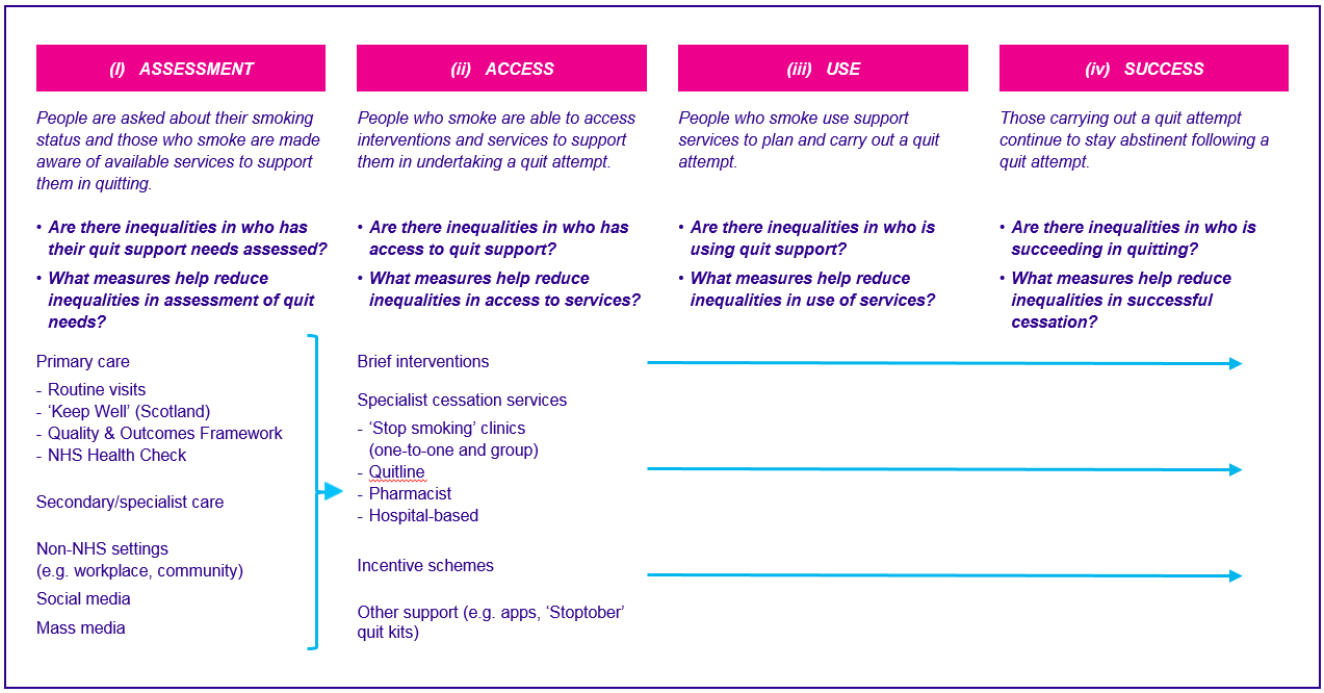
3.3.1 FRAMEWORK FOR SYSTEMATIC REVIEW

Our approach to identifying and synthesising relevant evidence was based on a conceptual model of the steps involved in a successful quit attempt (Figure 3). People who smoke may be identified and encouraged to engage with cessation services through a number of different routes, including NHS and non-NHS settings. A successful quit attempt depends both on a smoker being able to access and use the available services, and on the efficacy of the cessation support itself. Inequalities can thus emerge at any step in the cessation pathway – including who is *assessed* to identify their support needs; who has *access* to quit support services; who makes *use* of available quit services; and who has *success* in remaining abstinent after a quit attempt.

This systematic review, therefore, considered evidence on socioeconomic inequalities in experiences of cessation interventions at each step of the cessation pathway, encompassing campaigns, interventions and programmes aimed at encouraging and supporting smokers to quit, including mainstream/general programmes and those targeted at disadvantaged groups. More specifically, the first step of the pathway (assessment) covered health promotion initiatives, such as routine ascertainment of smoking status in primary care or through maternity services, which identify those

who might benefit from cessation support (e.g. the NHS Health Check). The remaining steps (access, use and success) included all interventions and initiatives that focused on supporting smokers to consider, undertake and maintain a smoking cessation attempt.

FIGURE 3: CONCEPTUAL MODEL OF THE CESSATION PATHWAY



3.3.2 STUDY ELIGIBILITY CRITERIA

Studies that met the following criteria were eligible for inclusion:

- Undertaken within the UK;
- Published since 2012 in English;
- Focused on adult (>= 16 years) participants or reported results separately for this group;
- Considered at least one cessation-relevant measure (see Figure 3) and one socioeconomic indicator; and,
- Compared this cessation-relevant measure across two or more SES groups or reported the results for a specific disadvantaged group.

Beyond this, we adopted a broadly inclusive approach, allowing:

- All primary research designs, including randomised controlled trials (RCTs), non-randomised trials, cohort studies (controlled and uncontrolled), cross-sectional studies and qualitative studies;
- Any type of smoking cessation intervention (e.g. specialist services, incentive schemes or mobile phone applications), including more general health promotion initiatives that incorporate an assessment of smoking status (e.g. NHS Health Check, QOF), with any length of follow-up; and,
- A wide range of socioeconomic indicators, such as education, income, occupational class, social grade, composite measures of individual disadvantage, and area-based measures of deprivation.

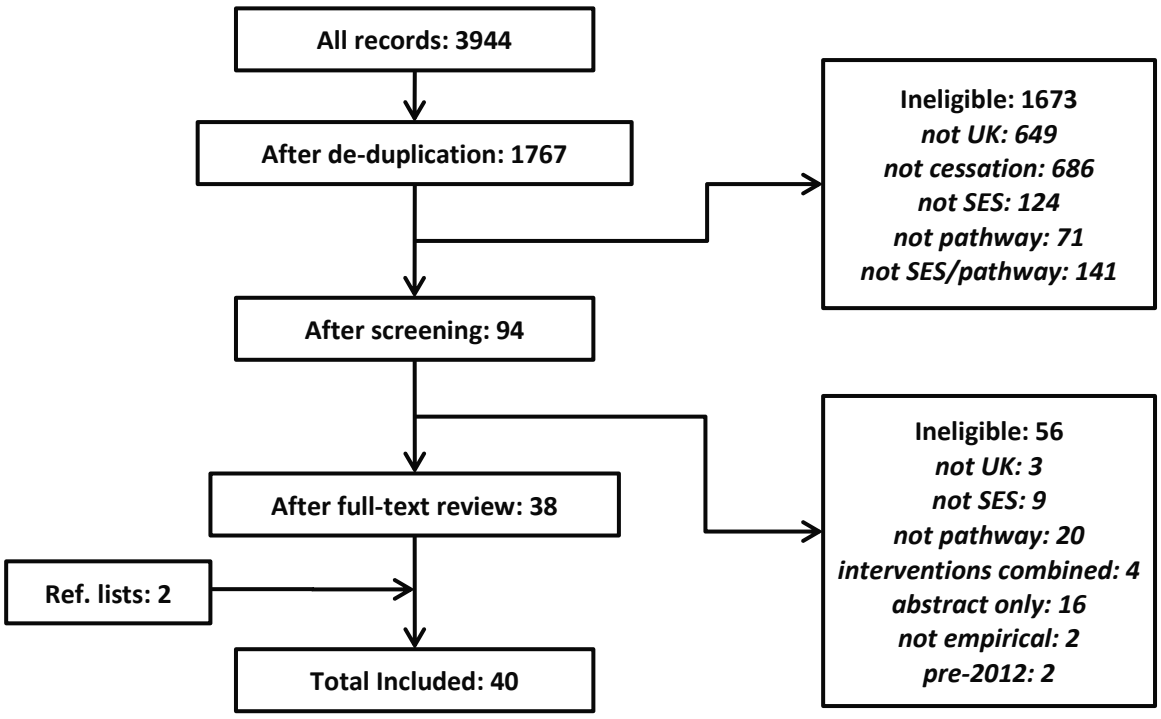
3.3.3 SEARCH PROCEDURE & RESULTS

Academic literature

Published academic articles were identified through a comprehensive search of 12 electronic bibliographic databases: MEDLINE, EMBASE, PsycINFO, BIOSIS, Science Citation Index Expanded, Social Sciences Citation Index, Emerging Sources Index, ASSIA, IBSS, Sociological Abstracts, CINAHL Plus and Cochrane Library. Two main blocks of search terms were used (each of which had been developed and tested in previous systematic reviews (Brown et al, 2014; Hill et al, 2014)), one covering socioeconomic inequalities and the other smoking cessation; papers that appeared in both blocks were eligible. In addition to these primary search blocks, a further set of terms was applied to limit the search to research conducted in the UK. The precise set of search terms can be found in Appendix A.

Searches were run on 14/04/17, leading to the identification of 3944 potential papers; these were loaded into EndNote reference manager software and duplicates removed, leaving 1767 unique articles which were screened to identify those references which reported on the findings of a smoking cessation intervention by socioeconomic status. A three-stage screening process was adopted. The titles and abstracts of potential articles were first scanned by CS to find those that focused on some aspect of smoking cessation and involved data collection within the UK. For those articles appearing relevant at this point, CS then conducted a closer examination of the abstracts to identify those presenting data on the cessation pathway and reporting findings by SES or within a disadvantaged group. Papers subject to this second phase of screening were separated according to likelihood of relevance to the review (high, possible, low), with any articles that were classified as 'possibles' being discussed with AA/SH and recategorised as having high or low potential. All papers rated as low at this stage were deemed to be ineligible and those rated as high were subject to a more detailed, full-text review to determine eligibility against the study inclusion criteria. As a result of this screening process, we located 38 relevant articles; scrutiny of the reference lists for these selected papers led to the identification of a further 2 relevant articles, giving a total of 40 for inclusion in the analysis (see Figure 4 for the associated PRISMA flow diagram).

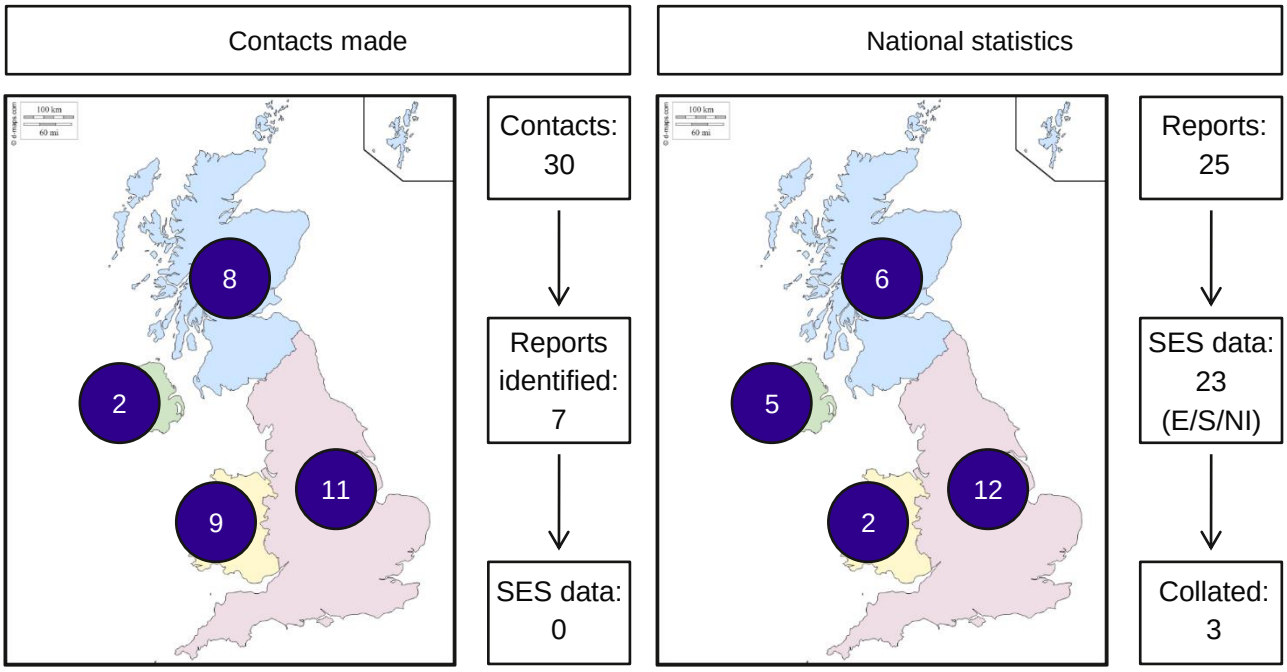
FIGURE 4: PRISMA FLOW DIAGRAM FOR ACADEMIC LITERATURE



Grey literature

Relevant grey literature published between 2012 and 2017 was sourced through key informants from a wide range of local and national organisations, such as Public Health England and Fresh North East (a full list of contacts can be found in Appendix B). Seven possible reports were identified but none provided data by SES (Figure 5). We were, however, able to include the three summary reports described in Section 3.2, containing collated information (from 23 separate reports and workbooks) on the performance of the NHS SSS in England, Scotland and Northern Ireland.

FIGURE 5: FLOW DIAGRAM FOR GREY LITERATURE



Source of maps: d-maps.com

Overall results

Combining the articles/reports identified through these separate academic and grey literature searches gave a total 43 papers (40 academic articles and 3 national reports) for inclusion in the analysis.

3.3.4 DATA EXTRACTION AND QUALITY APPRAISAL

Methods of data extraction were based on those developed and used in previous systematic reviews of the equity impact of smoking cessation interventions (Brown et al, 2014; Hill et al, 2014). For each of the 40 eligible academic papers, the following details were extracted: research design; location and years of data collection; sample characteristics; SES measures used; intervention type and setting; cessation pathway steps covered; and intervention outcomes by SES. Relevant data from the three national reports were collated according to the procedure outlined in section 3.2.

Study quality was assessed using a modified version of the CASP critical appraisal tools (CASP, 2017), in which the checklists for RCTs and cohort/case-control/qualitative studies were combined to create a single appraisal instrument which contained three separate modules, one covering core checklist items that related to all study designs, one covering items that related only to quantitative designs, and one covering qualitative designs (see Appendix C for a full description of the checklist items and how they map onto the CASP appraisal tools). All data extraction and quality appraisal were

undertaken by CS. The results were then checked by AA or SH, who also rated each paper according to its value to the review (see Table 2 for rating scale). This rating was not intended as a general assessment of study quality but rather as an indication of the extent to which the research design, data collection, analysis and reporting enabled the exploration of socioeconomic experiences of smoking cessation interventions. Thus, while some papers were of high overall quality, they were deemed to be of low value for the purposes of this systematic review. No formal quality appraisal was undertaken of the collated annual reports from the NHS stop smoking services. However, as these publications are classed as Official Statistics releases (UK Statistics Authority, 2009) and as they represent the sole source of national data covering all clients of the cessation services in UK, we have rated them as being of high value for this review.

TABLE 2: RATING SCALE FOR VALUE TO REVIEW

Value rating	Code
High	H
High/medium	H/M
Medium	M
Medium/low	M/L
Low	L

An overview of the quality appraisal findings for the complete set of 43 papers/reports is provided in Table 3 below. The full data extraction/quality appraisal sheets can be found in the Supplementary Data File.

TABLE 3: RESULTS OF QUALITY APPRAISAL

	Core (1)			Quantitative				Qualitative		Core (2)	
	SES/cessation focus	Data for SES appraisal	SES indicator	Confounding addressed	Endpoint measurement	Response rates	Adequate power	Sample profile	SES analysis	Generalisable	Value to review
Abbas (2015)[1]	N	U	Y	N	Y	N	NC	-	-	U	L
Bains (2015)[2]	Y	Y	U	-	-	-	-	U	Y	N	M
Bauld (2012)[3]	Y	Y	Y	Y	Y	Y	Y	-	-	U	H
Bauld (2016)[4]	N	Y	Y	Y	Y	Y	Y	-	-	U	H
Beard (2016)[5]	P	Y	Y	N	N	NA	NC	-	-	Y	L
Bennett (2015)[6]	Y	Y	U	Y	U	U	N	-	-	Y	M
BinDhim (2014)[7]	P	Y	Y	N	N	N	NC	-	-	N	L
Blane (2017)[8]	N	Y	Y	Y	M	NA	M	-	-	Y	H/M
Brose (2012)[9]	N	Y	M	Y	Y	U	Y	-	-	U	H/M
Brose (2013)[10]	N	Y	N	P	Y	U	Y	-	-	Y	H/M
Brose (2016)[11]	Y	Y	Y	Y	Y	U	Y	-	-	Y	H
Brown (2014)[12]	Y	Y	Y	Y	Y	Y	Y	-	-	U	H
Campbell (2016)[13]	P	Y	Y	-	-	-	-	Y	P	N	H/M
Campbell (2017)[14]	Y	Y	Y	P	U	Y	Y	-	-	N	H/M
Dhalwani (2013)[15]	P	Y	Y	Y	U	NA	Y	-	-	Y	H
Dhalwani (2014)[16]	P	Y	Y	P	Y	NA	Y	-	-	Y	H
DoH NI (2016)[17]	-	-	-	-	-	-	-	-	-	-	H
Douglas (2013)[18]	Y	Y	Y	P	U	NA	Y	-	-	Y	H/M
Forster (2016)[19]	P	Y	Y	Y	Y	NA	Y	-	-	Y	H
Gilbert (2017)[20]	N	Y	Y	U	Y	N	N	-	-	N	M
Hamilton (2016)[21]	Y	Y	Y	Y	Y	NA	M	-	-	S	H/M
Hardy (2014)[22]	P	Y	Y	Y	U	NA	Y	-	-	Y	H/M
Herbec (2014)[23]	P	Y	Y	Y	U	U	NC	-	-	U	L
Hiscock (2013)[24]	Y	Y	M	M	M	U	U	-	-	U	H/M
Hiscock (2015)[25]	Y	Y	Y	Y	Y	Y	U	-	-	U	H/M
Ierfino (2015)[26]	Y	Y	M	M	Y	N	N	-	-	M	M
ISD (2017)[27]	-	-	-	-	-	-	-	-	-	-	H
Kassim (2016)[28]	Y	Y	Y	N	Y	U	U	-	-	S	M
Kotz (2014)[29]	N	Y	U	N	U	NA	NC	-	-	Y	L
Maskrey (2015)[30]	N	Y	M	Y	Y	U	Y	-	-	S	H/M
McAlpine (2015)[31]	Y	Y	Y	N	U	U	NC	-	-	N	L
NHS Digital (2017)[32]	-	-	-	-	-	-	-	-	-	-	H

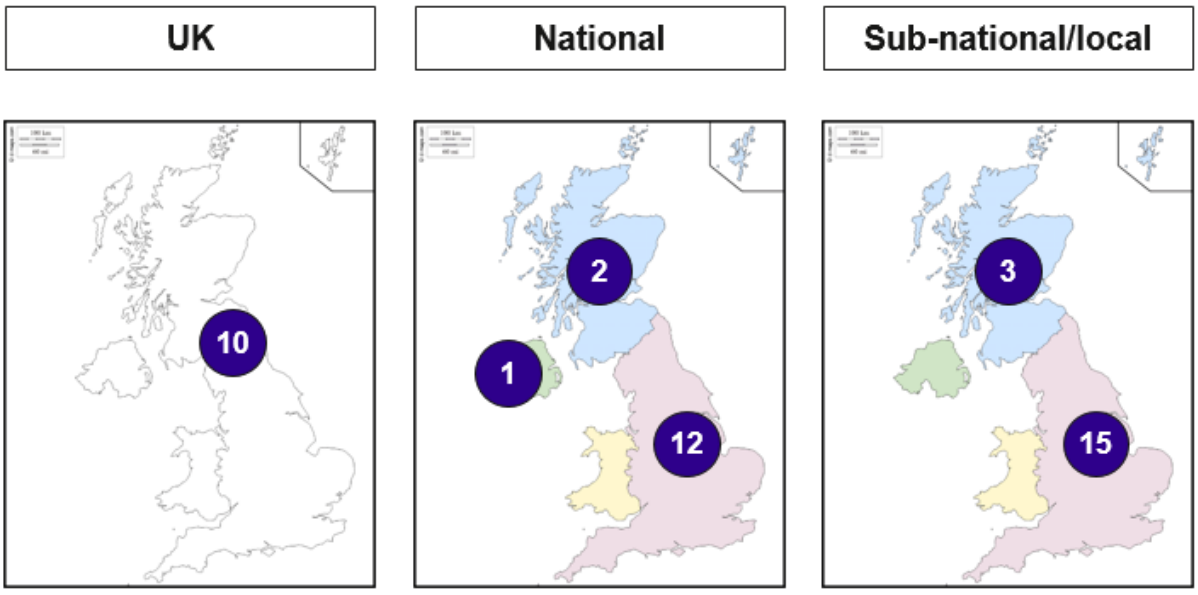
Ormston (2015)[33]	Y	Y	Y	M	M	M	Y	M	Y	U	H/M
Radley (2013)[34]	Y	Y	Y	N	U	N	M	Y	Y	N	M/L
Sloan (2016)[35]	Y	Y	Y	-	-	-	-	Y	Y	N	H/M
Stapleton (2013)[36]	P	Y	M	Y	Y	U	NC	-	-	U	L
Taggar (2012)[37]	P	Y	Y	Y	U	NA	Y	-	-	Y	H/M
Tappin (2015)[38]	Y	Y	Y	Y	Y	N	Y	-	-	S	H/M
Thompson (2016)[39]	Y	Y	Y	Y	M	M	N	-	-	N	M/L
Turner (2013)[40]	N	M	M	N	Y	NA	N	P	N	U	M/L
Ubhi (2015)[41]	N	Y	U	N	U	NA	Y	-	-	N	M/L
Venn (2016)[42]	Y	Y	M	N	M	N	M	-	-	U	M
West (2013)[43]	Y	N	N	N	U	NA	U	-	-	Y	M/L

Key for checklist items (except for value to review, which is defined above)
M: mixed; NC: not possible to draw any conclusions; P: partial; S: generalisable within subpopulation; U: unclear

3.3.5 OVERVIEW OF ELIGIBLE PAPERS AND REPORTS

Of the 43 papers identified, approximately one-quarter (10) presented data on interventions that were implemented across the UK (Figure 6). Among the remaining 33 papers, there was a roughly even split between those that concentrated on one particular constituent nation (15) and those that had a more local or sub-national emphasis (18); nearly all of these sub-UK papers focused on evaluating interventions conducted in England (27).

FIGURE 6: GEOGRAPHICAL SPREAD OF INTERVENTIONS INCLUDED IN ELIGIBLE PAPERS



Source of maps: d-maps.com

The majority of papers (37) employed a quantitative research methodology, while three adopted a qualitative approach, and three a mixed-methods design. A wide variety of intervention types and settings were examined (Table 4), with just under half the papers (18) looking at interventions delivered through the NHS stop smoking services. These articles focused primarily on assessing the impact of the standard cessation services (12), although several did look at more innovative

interventions, such as community-based schemes (3) and relapse prevention treatment (2). A further ten papers focused on interventions within general practice, taking in both general initiatives, such as the NHS Health Check, as well as interventions targeted specifically at smoking cessation. Moreover, a small number of articles looked at financial incentive schemes delivered through a variety of settings (4) and interventions delivered through antenatal clinics (3). Beyond these more traditional health care settings, four papers also evaluated digital interventions that sought to provide cessation support through apps and websites.

TABLE 4: INTERVENTION TYPES & SETTINGS COVERED BY ELIGIBLE PAPERS

	Intervention setting		
	General Practice (10)	SSS (18)	Miscellaneous (15)
Intervention type	Routine care (4) QOF (3) Tailored communications (2) NHS Health Check (1)	Standard SSS (10) Drop-in rolling group SSS (1) One-to-one SSS (1) Community-based SSS (3) Relapse prevention (2) Medication (1)	Incentives (4) Digital (4) Antenatal CO testing (3) Reduce to quit (1) Workplace health check (1) Mixed (2)

All aspects of the cessation pathway were covered, with seven articles presenting data in relation to assessment, 15 in relation to access, 22 in relation to use and 26 in relation to success. Overall, the extent and range of the identified papers provided a good basis for the systematic review, although there were several limitations in the evidence base. First, the majority of articles drew on data collected prior to 2014. Moreover, only 23 papers were specifically designed to assess socioeconomic differences in experiences of cessation interventions and, as a result, a number of articles were found to be of only limited relevance to the review, with less than a quarter (10) being judged to be of high value (Table 5).

TABLE 5: VALUE TO REVIEW OF ELIGIBLE PAPERS

Value rating	No.
High	10
High/medium	15
Medium	6
Medium/low	5
Low	7

3.3.6 ANALYTICAL APPROACH

Wide variation in the types of cessation support considered, and in the socioeconomic and outcome measures used (Table 6), meant that a meta-analysis was not feasible. Instead, a narrative synthesis was undertaken of all 43 eligible papers (including the key findings from the collated SSS reports), in which we sought to summarise the available evidence on socioeconomic experiences of smoking cessation support in the UK. The synthesis was divided into two strands, the first assessing socioeconomic differences in intervention outcomes (i.e. equity impact), and the second focusing on the effectiveness of interventions targeted at low SES groups.

TABLE 6: DETAILED CHARACTERISTICS OF EACH ELIGIBLE PAPER

	Intervention details		SES		Pathway stages covered			
	Setting	Type of cessation support	Equity	Measures	Assess	Access	Use	Success
Abbas (2015)[1]	Innov	Workplace health check	Target	Low paid employees		Y		
Bains (2015)[2]	SSS/ Innov	Community-based, mobile drop-in SSS targeted at disadvantaged areas (also ref. 42)	Target	Deprived area		Y		
Bauld (2012)[3]	SSS	Drop-in rolling group	Both	Composite				Y
Bauld (2016)[4]	SSS	Range of pharmacological &/or behavioural support services	Equity	Composite				Y
Beard (2016)[5]	SSS	Use of cessation medication & behavioural support in general smoking population (STS)	Equity	Social grade			Y	
Bennett (2015)[6]	GP/ Innov	Customised cessation advice report matched to smoker's reading level plus GP endorsement letter	Both	Literacy level				Y
BinDhim (2014)[7]	Innov	Smartphone app providing evidence-based cessation information	Equity	Education		Y		
Blane (2017)[8]	GP	Routine care	Equity	Carstairs		Y	Y	
Brose (2012)[9]	SSS	One-to-one	Equity	Occupation; IMD; free prescription				Y
Brose (2013)[10]	SSS	Range of pharmacological &/or behavioural support services	Equity	Free prescription			Y	Y
Brose (2016)[11]	SSS	Range of pharmacological &/or behavioural support services	Equity	IMD; free prescription			Y	Y
Brown (2014)[12]	Innov	StopAdvisor website designed to emulate support provided by SSS	Both	Occupation				Y
Campbell (2016)[13]	Innov	Routine CO screening in antenatal clinics, with opt-out SSS referral (also refs. 14 & 35)	Target	Deprived area	Y	Y		
Campbell (2017)[14]	Innov	Routine CO screening in antenatal clinics, with opt-out SSS referral (also refs. 13 & 35)	Target	Deprived area		Y	Y	Y
Dhalwani (2013)[15]	GP	QOF	Equity	Townsend	Y			
Dhalwani (2014)[16]	GP	Routine care	Equity	Townsend			Y	
DoH NI (2016)[17]	SSS	Range of pharmacological &/or behavioural support services	Equity	NIMDM			Y	Y
Douglas (2013)[18]	GP	Routine care	Equity	Townsend; Mosaic		Y	Y	
Forster (2016)[19]	GP	NHS Health Check	Equity	IMD	Y			
Gilbert (2017)[20]	GP/ Innov	Customised risk letter from GP plus invite to no-commitment SSS taster session	Equity	IMD		Y		Y
Hamilton (2016)[21]	GP	QOF+	Equity	IMD	Y	Y		

Hardy (2014)[22]	GP	Routine care	Equity	Townsend		Y		
Herbec (2014)[23]	Innov	MumsQuit website offering tailored support to pregnant smokers similar to that provided by SSS (adapted from StopAdvisor)	Equity	Education; occupation		Y		Y
Hiscock (2013)[24]	SSS	Range of pharmacological &/or behavioural support services	Equity	Occupation; free prescription			Y	Y
Hiscock (2015)[25]	SSS	Range of pharmacological &/or behavioural support services	Equity	Composite			Y	Y
Ierfino (2015)[26]	Innov	Financial incentives scheme targeted at pregnant smokers	Both	IMD; education		Y	Y	Y
ISD (2017)[27]	SSS	Range of pharmacological &/or behavioural support services	Equity	SIMD			Y	Y
Kassim (2016)[28]	SSS/ Innov	Community-based, outreach SSS	Target	Deprived area				Y
Kotz (2014)[29]	SSS	Use of cessation medication & behavioural support in general smoking population (STS)	Equity	Social grade			Y	
Maskrey (2015)[30]	SSS/ Innov	Pack of relapse prevention booklets delivered through SSS	Equity	Education; free prescription				Y
McAlpine (2015)[31]	SSS	Range of pharmacological &/or behavioural support services	Both	Occupation				Y
NHS Digital (2017)[32]	SSS	Range of pharmacological &/or behavioural support services	Equity	Occupation			Y	Y
Ormston (2015)[33]	Innov	Financial incentives scheme targeted at smokers living in deprived areas	Target	Deprived area			Y	Y
Radley (2013)[34]	Innov	Financial incentives scheme targeted at pregnant smokers	Both	IMD			Y	Y
Sloan (2016)[35]	Innov	Routine CO screening in antenatal clinics, with opt-out SSS referral (also ref. 13 & 14)	Target	Deprived area	Y	Y		
Stapleton (2013)[36]	SSS/ Innov	RCT of 3 forms of pharmacotherapy (NRT, bupropion, NRT + bupropion)	Equity	Education; state benefits				Y
Taggar (2012)[37]	GP	QOF	Equity	Townsend	Y	Y		
Tappin (2015)[38]	Innov	Financial incentives scheme targeted at pregnant smokers	Target	Deprived area			Y	Y
Thompson (2016)[39]	Innov	Physical exercise intervention for assisted reduction to quit	Target	Deprived area			Y	Y
Turner (2013)[40]	SSS/ Innov	Extended course of NRT for relapse prevention among SSS clients	Equity	Occupation; free prescription			Y	
Ubhi (2015)[41]	Innov	Freely available stop smoking app (SmokeFree28)	Equity	Occupation			Y	Y
Venn (2016)[42]	SSS/ Innov	Community-based, mobile drop-in SSS targeted at disadvantaged areas (also ref. 2)	Both	Multiple		Y	Y	Y
West (2013)[43]	SSS	Range of pharmacological &/or behavioural support services	Equity	Free prescription			Y	

Overall, 34 papers addressed equity impact, with seven papers looking at SES differences in outcomes within a targeted disadvantaged group. Here, findings were presented separately for each stage of the cessation pathway (i.e. assessment, access, use and success) and, within each stage, interventions were further grouped by broad type (i.e. general practice (GP), SSS or innovation) to aid interpretation. Equity impact was classified using the schema below and, where papers reported equity impact for a range of different SES indicators, outcome measures and/or sociodemographic factors, each result was given a separate equity impact classification. By summarising equity impact in this way, we were able to give structure to a diverse and complex literature. There was, however, insufficient data to allow comparison of different levels of socioeconomic disadvantage across papers, or to explore changes in equity impact over the SES gradient.

Positive [++]:	Strong evidence that lower SES groups relatively more responsive to intervention (either a robust measure from a national dataset or supported by a formal statistical comparison showing a significant difference between groups)
Possibly positive [+]:	Some evidence that lower SES groups relatively more responsive to intervention (either a weak measure from a national dataset or a large difference between groups but study underpowered/no formal statistical analysis undertaken)
Neutral [o]:	Evidence that intervention had same impact across low and high SES groups (supported by a formal statistical analysis with adequate power)
Possibly negative [-]:	Some evidence that higher SES groups relatively more responsive to intervention (either a weak measure from a national dataset or a large difference between groups but study underpowered/no formal statistical analysis undertaken)
Negative [--]:	Strong evidence that higher SES groups relatively more responsive to intervention (either a robust measure from a national dataset or supported by a formal statistical comparison showing a significant difference between groups)
Unclear [?]:	Not able to assess intervention impact based on available evidence

Sixteen papers focused on evaluating interventions that were targeted at disadvantaged groups (including the seven papers which also reported an equity impact analysis). Here, findings were classified according to intervention effectiveness: a positive rating was used to indicate that the intervention resulted in better outcomes than a control or internal/external comparator, and a negative score to indicate that the intervention resulted in worse outcomes. While the small number of 'targeted' papers looking at assessment and access meant that it was not possible to present the results separately for each pathway stage, findings could be grouped by broad intervention type (SSS, financial incentives, or other innovation).

Throughout both strands of the narrative synthesis, the overall value rating for the paper and the individual equity impact (effectiveness) score for each finding [e.g. H, ++] is included to give an indication of the strength of evidence in relation to that result.

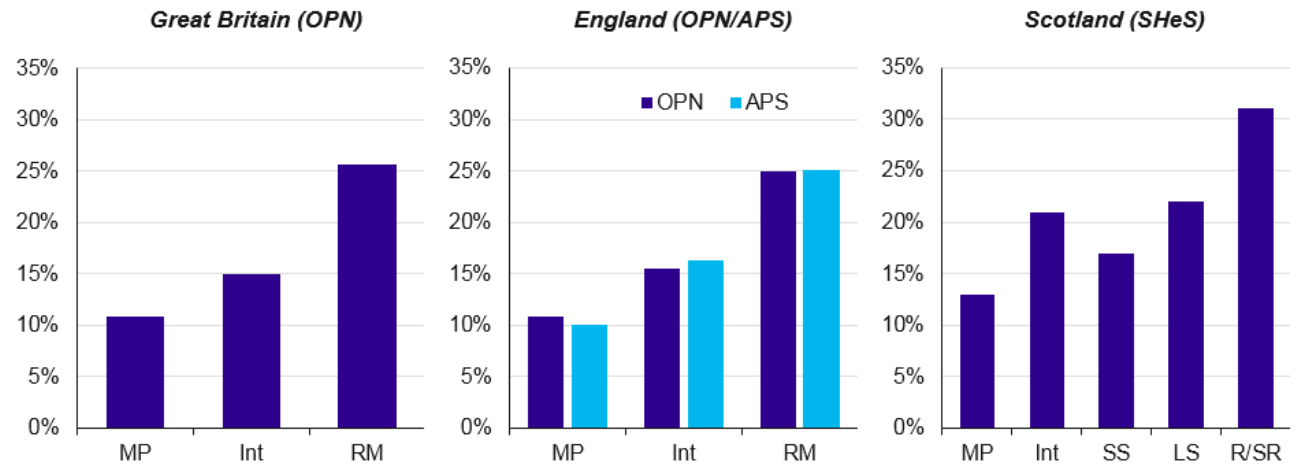
4 SOCIOECONOMIC INEQUALITIES IN SMOKING ACROSS THE UK

National survey data show clear and consistent patterns and trends on inequalities and smoking both across the UK and within the constituent nations (Bardsley et al, 2017; NHS Digital, 2016; ONS, 2017c-e; Scarlett & Denvir, 2016; Welsh Government, 2017).

4.1 SMOKING AND SOCIOECONOMIC STATUS: PATTERNS

Adult smoking prevalence is highly associated with socioeconomic status; irrespective of the SES measure used, smoking prevalence is higher in more disadvantaged groups. In relation to occupational group (Figure 7), the rate of current smoking in 2016 among routine and manual workers (pink bars) was more than double that in the managerial and professional groups (dark blue bars) across both Great Britain (OPN: 26% vs 11%) and England (OPN: 25% vs 11%; APS: 25% vs 10%). Data for the same year in Scotland likewise showed smoking prevalence among the routine and semi-routine group (31%) was over twice that in the professional and managerial occupations (13%).

FIGURE 7: CURRENT SMOKING BY OCCUPATIONAL GROUP (NS-SEC), 2016

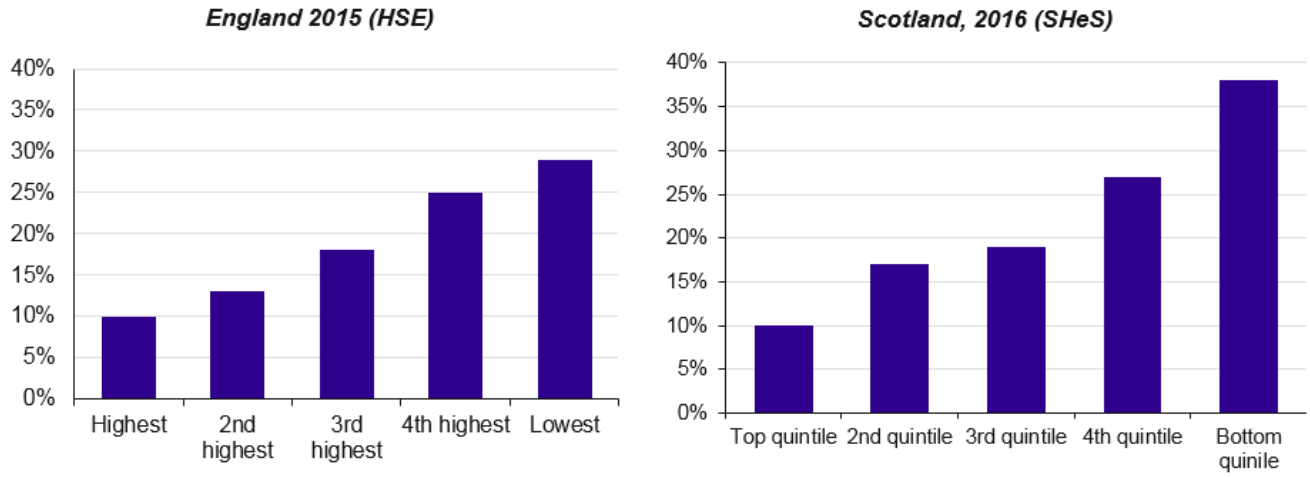


MP: managerial & professional
RM: routine & manual

Int: intermediate
LS: lower supervisory/technical

SS: self-employed & small employers
R/SR: routine & semi-routine

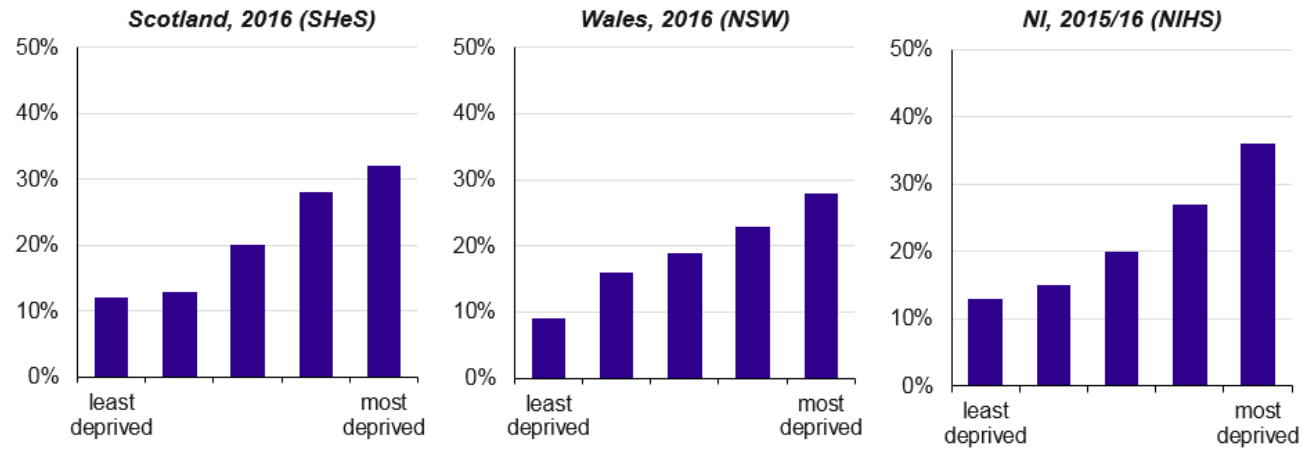
FIGURE 8: CURRENT SMOKING BY EQUIVALISED HOUSEHOLD INCOME, 2015-16



Analyses using equivalised household income as a measure of SES found even greater differences (Figure 8). In 2015, there was a threefold difference in smoking prevalence for those living in the poorest households in England compared to those living in the most affluent households (HSE: 29% vs 10%). Moreover, in Scotland in 2016, the least affluent quintile were nearly four times more likely to smoke than the richest quintile (SHeS: 38% vs 10%).

Area-based measures of deprivation (the Index of Multiple Deprivation) similarly revealed wide socioeconomic differences in smoking prevalence across the devolved nations (Figure 9). In 2016, those resident in the most disadvantaged areas of Scotland had more than twice the smoking prevalence of those living in the most affluent areas (SHeS: 32% vs 12%), whereas in Wales smoking prevalence was three times higher in the poorest compared to the richest areas (NSW: 28% vs 9%). For Northern Ireland, smoking prevalence in 2015/16 ranged from 36% in the most deprived areas to 13% in the least deprived areas (NIHS).

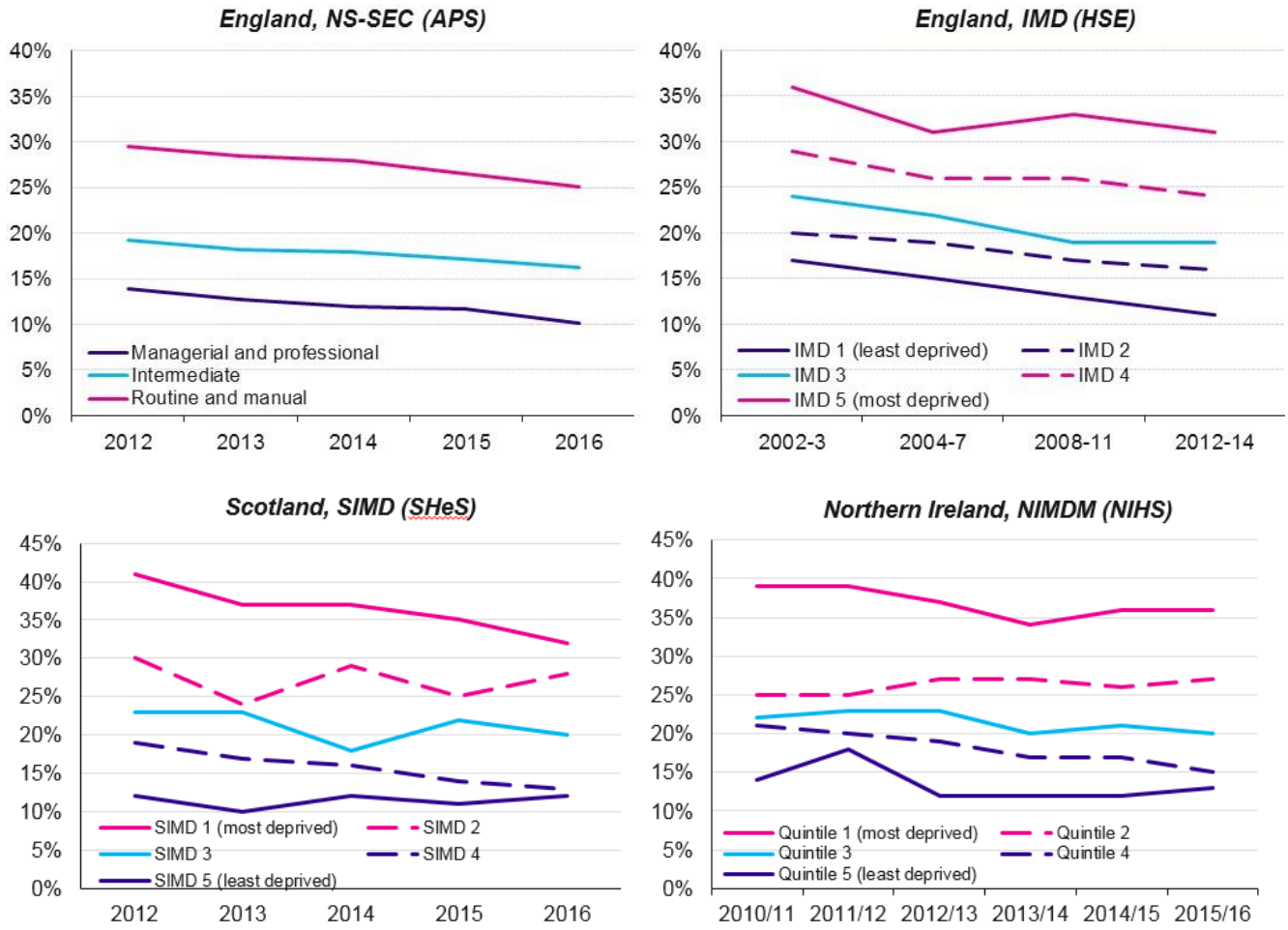
FIGURE 9: CURRENT SMOKING BY AREA DEPRIVATION QUINTILE, 2015-16



4.2 SMOKING AND SOCIOECONOMIC STATUS: TRENDS

While the periods for which smoking trends are available by SES varied between countries (reflecting how long the different surveys have been used to collect these data), a similar pattern did nevertheless emerge across the constituent nations of the UK (Figure 10). In England, the APS showed declines in smoking in all three occupational groups between 2012 and 2016, though there did not appear to be a reduction in inequality, with no narrowing in the gap between the routine and semi-routine group and the professional and managerial group. The HSE provides data over a longer period: an unpublished analysis of data from 2002 to 2014 showed declines in smoking in all five deprivation quintiles, but again no apparent reduction in inequalities in recent years. The trend in the SES patterning of smoking in Northern Ireland is less clear, perhaps reflecting the smaller survey sample size. Some but not all deprivation quintiles showed declines in smoking between 2010/11 and 2015/16. In Scotland, smoking declined between 2012 and 2016 in all deprivation quintiles apart from those living in the least deprived areas. Thus, there appears to have been a reduction in inequalities in smoking over this period, though this is in part due to the lack of decline in the least deprived group. No trend data were available for Wales.

FIGURE 10: TRENDS IN CURRENT SMOKING BY SES, 2002-16



In conclusion, across the UK there is reasonably consistent evidence that in recent years smoking has been declining in most SES groups. However, there is little evidence, apart from perhaps in Scotland, that there has also been a reduction in inequalities in smoking over this period.

5 NATIONAL EQUITY ANALYSIS OF NHS STOP SMOKING SERVICES

5.1 SERVICE-LEVEL IMPACT

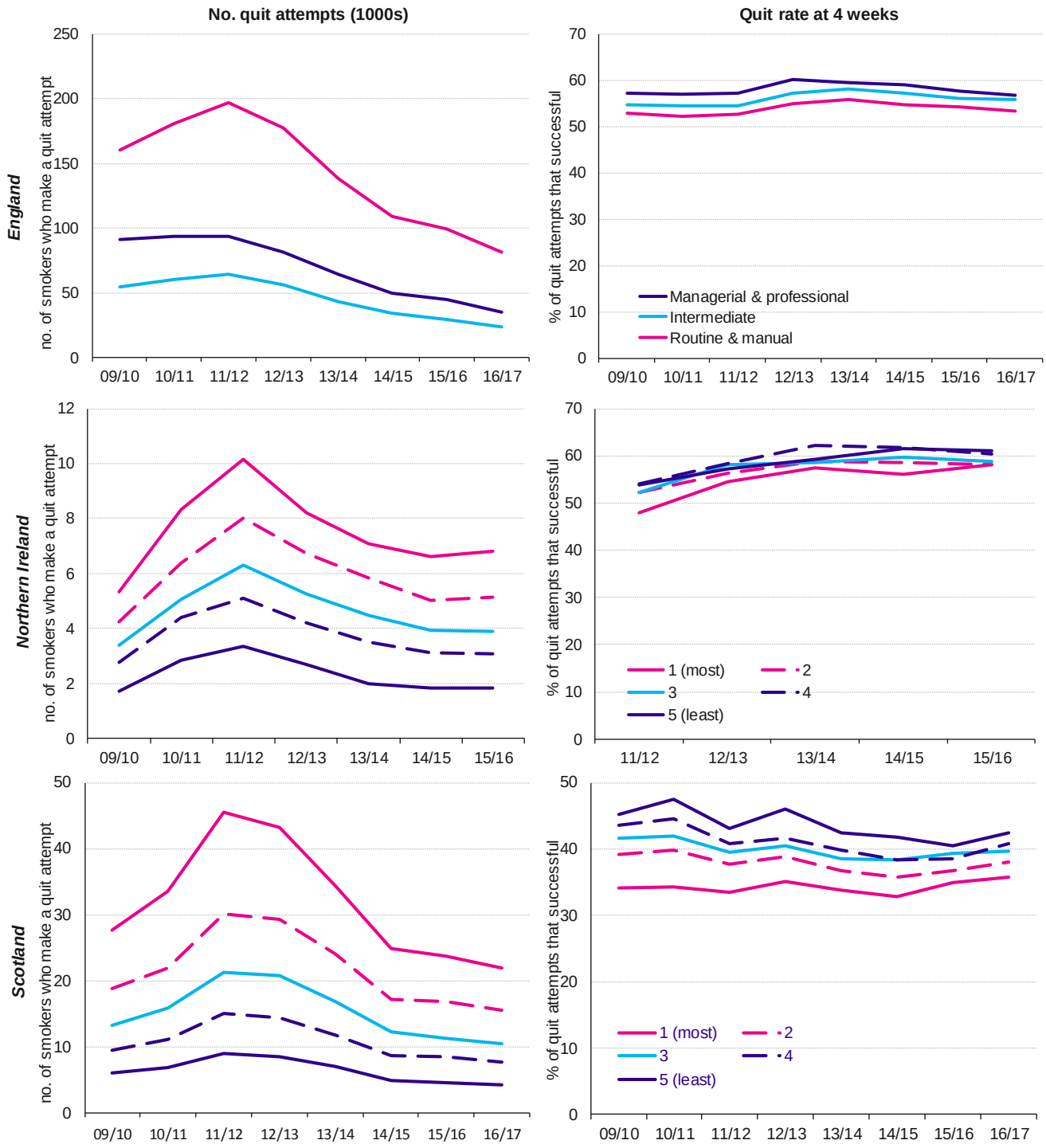
5.1.1 NUMBER OF QUIT ATTEMPTS

Trends in the number of SSS-supported quit attempts were broadly similar across all three countries, with the numbers rising steadily between 2009/10 and 2011/12 but then falling back sharply over the next few years, although the decline may now have been halted in Northern Ireland (Figure 11). The specific reasons for this rapid drop in numbers are unclear but are likely to be multifactorial, including the emergence and increasing use of e-cigarettes (although evidence on the precise impact of this trend is still unclear (Beard et al, 2016)), a reduced emphasis on mass media campaigns (apart from Stoptober in England), declining levels of investment in the stop smoking services across the UK, and the transfer of the English services to local authority control (CRUK 2016, Reid et al 2017). While the pattern of falling numbers was evident for all socioeconomic groups, there was nevertheless wide variation by SES, with the highest number of quit attempts observed among the most disadvantaged smokers across all countries and all time-points.

5.1.2 QUIT SUCCESS RATES

While SSS-supported quit attempts showed similar declines across England, Scotland and Northern Ireland, geographical differences were evident in relation to four-week quit success rates (i.e. in the proportion of those making a quit attempt who succeeded in staying abstinent for four weeks). In England, the quit success rate remained remarkably steady at around 55% from 2009/10 to 2016/17 (Figure 11), even in the face of major changes in the social and policy landscapes. Once again, there was a consistent, albeit much smaller, difference in the quit rates by occupational group although here the highest quit rates were seen among the most affluent groups and the lowest among routine and manual workers. Quit rates in Northern Ireland, on the other hand, appear to have increased in recent years, rising from 52% in 2011/12 to 59% in 2015/16. While rates in the most disadvantaged group were slightly lower than in the most affluent group across all time points, the gap may be narrowing. The picture with respect to Scotland was, however, markedly different. Not only were overall quit rates much lower, at under 40% compared to 50-60% for England and Northern Ireland, but the gap between the most and least disadvantaged groups was considerably wider. As in Northern Ireland, there does appear to have been some narrowing of the socioeconomic gap in recent years, although this is likely to be explained, at least in part, by a large decrease in the follow-up rate among more affluent groups.

FIGURE 11: NHS STOP SMOKING SERVICE PERFORMANCE STATISTICS BY SES INDICATORS



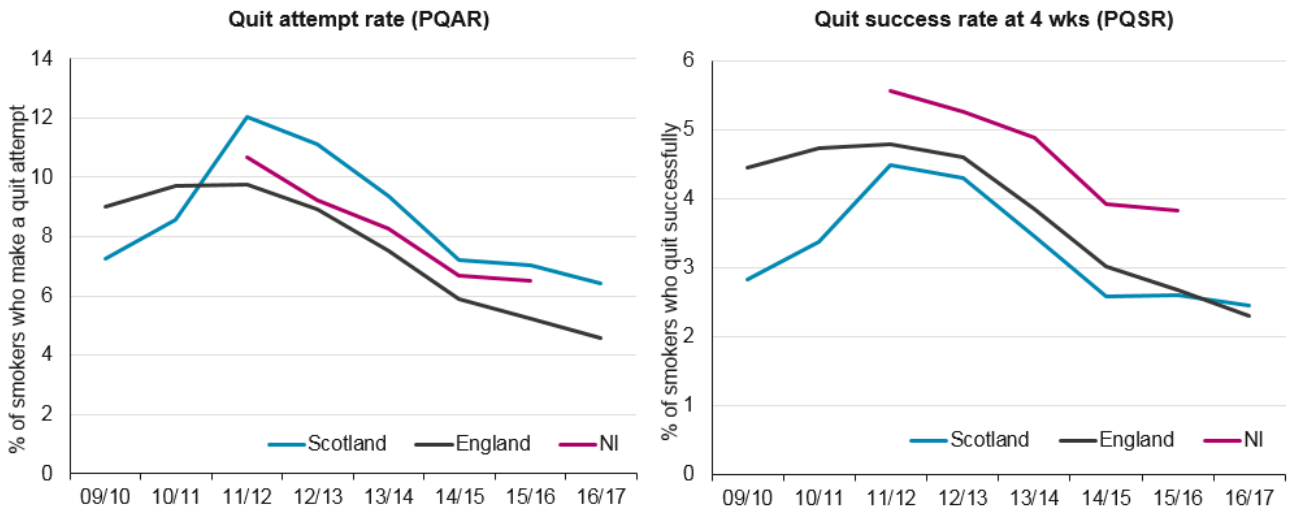
Sources: NHS Digital (2012-17) Statistics on NHS Stop Smoking Services, England[32]
NI Department of Health (2012-16) Statistics on Smoking Cessation Services in Northern Ireland[17]
ISD (2012-17) NHS Smoking Cessation Services, Scotland[27]

5.2 POPULATION-LEVEL IMPACT

5.2.1 OVERALL POPULATION-LEVEL IMPACT

Overall population quit attempt rates (PQARs) for stop smoking services (i.e. the proportion of all smokers who make a quit attempt with an SSS) reflect the underlying trends in the number of quit attempts made (Figure 12). In England, the rate of attempted quits increased slightly from 9.0% of all smokers in 2009/10 to 9.8% in 2011/12 but has been decreasing sharply ever since, and in 2016/17 stands at half the rate (4.6%) seen at the beginning of the study period. While in 2009/10, the PQAR was lower in Scotland than in England (7.3%), Scotland subsequently experienced a steep increase in recruitment, possibly as a result of the introduction of deprivation-based 'HEAT' targets (Scottish Government, 2014), such that in 2011/12 the Scottish rate (12.1%) exceeded that in England (9.8%) by a considerable margin. Quit attempt rates in Scotland have also been dropping in more recent years, although the rapid increase in 2011/12 means that the gap between the PQARs in 2009/10 and in 2016/17 was not as great (7.3% vs 6.4%) as that seen in England. PQARs for Northern Ireland followed a similar pattern, with rates sitting between those for England and Scotland throughout the period 2011/12 to 2015/16.

FIGURE 12: COMPARISON OF POPULATION QUIT ATTEMPTS AND SUCCESS RATES ACROSS ENGLAND, SCOTLAND, AND NORTHERN IRELAND



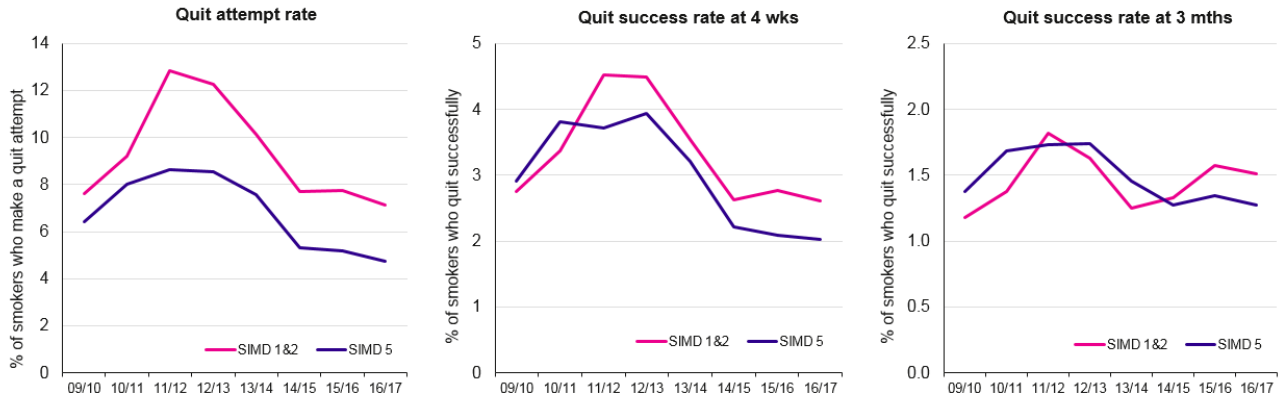
Population quit success rates (PQSRs) at four weeks have similarly been falling steadily across all three countries in recent years (Figure 12), although here rates have been consistently much higher in Northern Ireland. While a dramatic improvement in the Scottish PQSR in 2011/12 (mirroring the sharp increase in the population quit attempt rate) brought it closer to the PQSR for England, the Scottish rate nevertheless continued to lag behind that for England. In the last two years, however, the PQSRs for these two countries have converged and, for the first time in 2016/17, the Scottish rate was slightly higher (S: 2.5% vs E: 2.3%). Thus, stop smoking services in both Northern Ireland and Scotland are now supporting a higher proportion of smokers to make a successful quit attempt than services in England.

5.2.2 EQUITY IMPACT AT POPULATION-LEVEL

A robust analysis of SSS equity impact at the population-level was only possible for Scotland. Here. the population quit attempt rate (PQAR) for smokers living in the 40% most deprived areas of

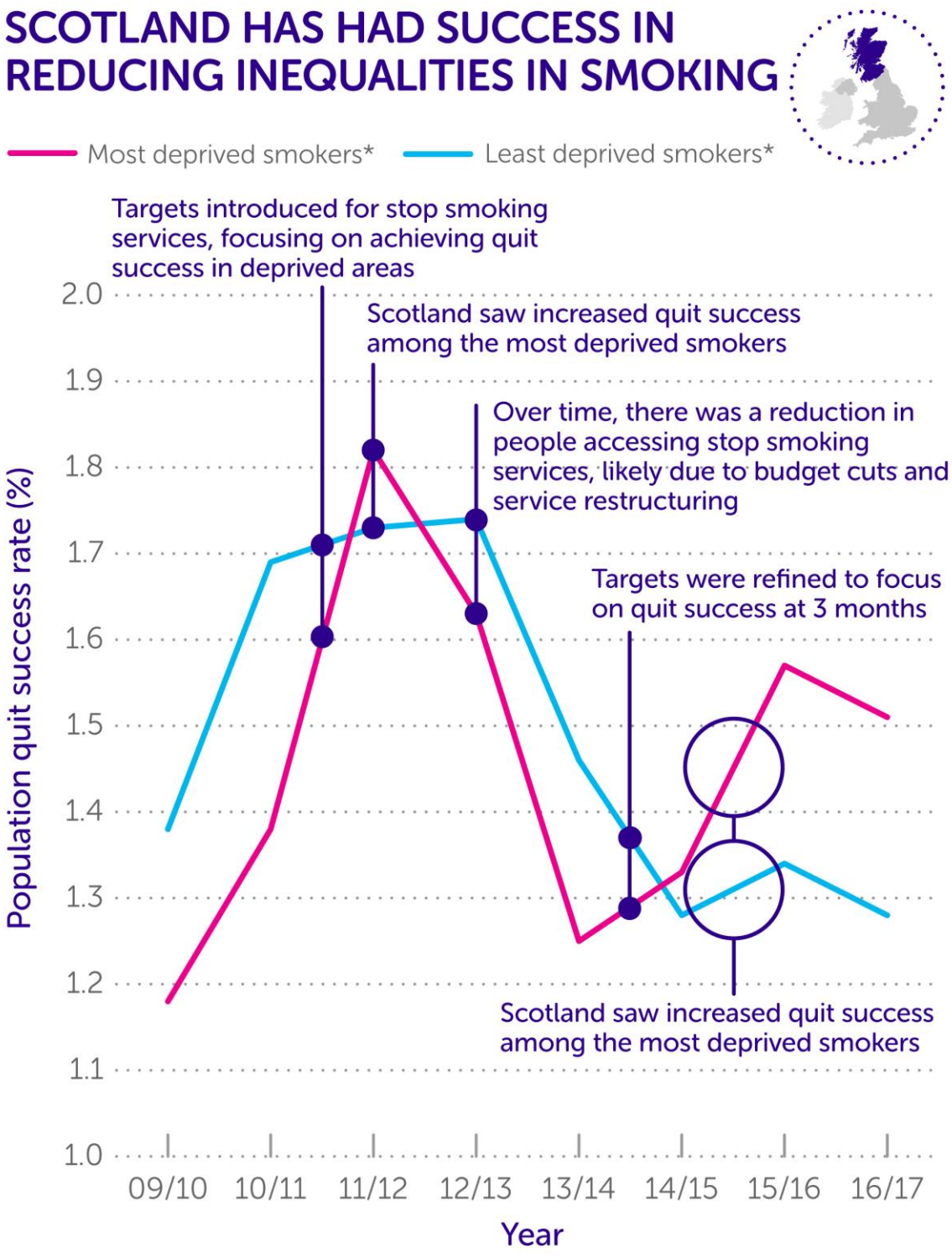
Scotland (SIMD 1&2) was higher than the rate for smokers living in the least disadvantaged areas (SIMD 5) throughout the period 2009/10-2016/17 (Figure 13). In relation to quit success at four weeks, the PQSR was higher among the most affluent smokers in 2009/10 and 2010/11, but since the introduction of the deprivation-based HEAT target (Scottish Government, 2014) in 2011, the PQSR has been higher among the most disadvantaged smokers. In contrast, the population quit success rate at three months remained higher in the most affluent smokers until relatively recently. Following a further revision of the HEAT targets in 2014 (Scottish Government, 2014), however, putting the emphasis on quit success at three months rather than at four weeks, the 3-month PQSR is now also higher in the most deprived SIMD quintile. Taken together, these results suggest that the Scottish SSS currently have an equity positive impact on both cessation attempts and on cessation success in the short and medium-term (and thus possibly on smoking prevalence), with successive refinements of the HEAT targets seeming to play a part in achieving this effect (Figure 14).

FIGURE 13: EQUITY IMPACT OF SCOTTISH STOP SMOKING SERVICES



Results of the equivalent population-level equity impact analyses for England were inconclusive due to differences in the availability and consistency of SES measures across information sources. While the findings for Northern Ireland were similarly affected by high levels of missing SES data, recent improvements in data recording meant that the estimates for 2015/16 were more reliable. Here, comparison of PQARs/PQSRs for the least and most deprived areas suggested that stop smoking services in Northern Ireland may now also be having an equity-positive effect on quit attempts (least deprived=6.5%; most deprived=7.1%) and four-week quit success (least deprived=3.8%; most deprived=4.1%). Full details of the sensitivity analyses for England and Northern Ireland can be found in Section 3.2.

FIGURE 14: EQUITY IMPACT OF HEAT TARGETS ON SCOTTISH STOP SMOKING SERVICES



Population quit success rate at 3 months for least deprived and most deprived groups

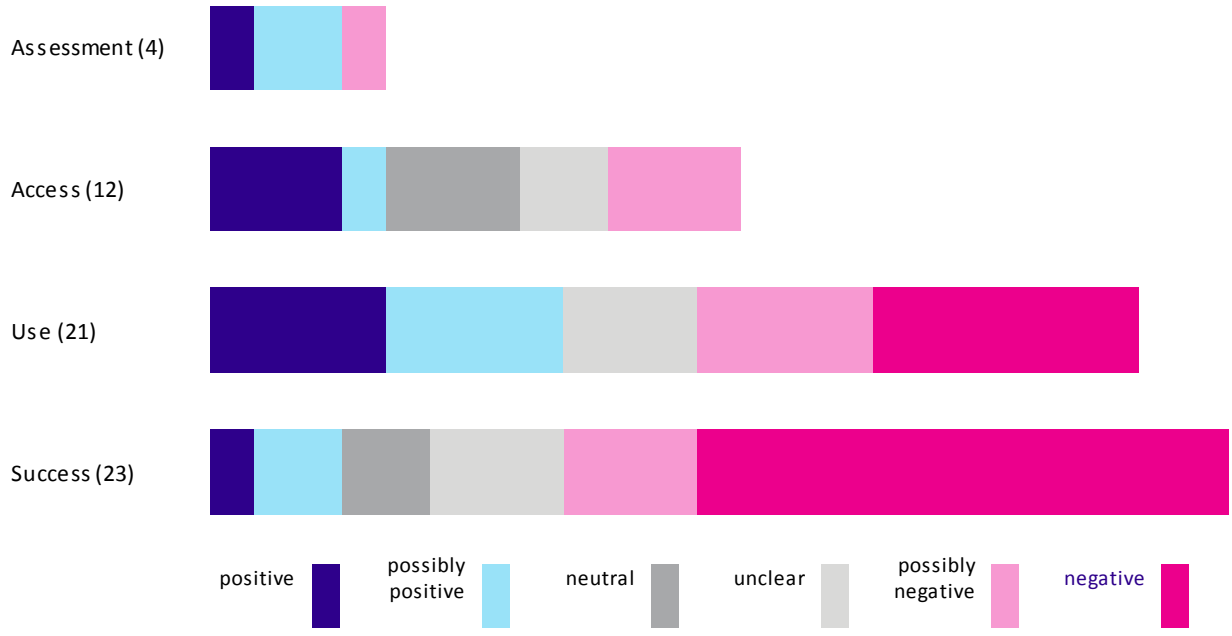
*Deprivation defined using Indices of Multiple Deprivation quintiles.

6 SYSTEMATIC REVIEW OF SOCIOECONOMIC INEQUALITIES IN CESSATION SUPPORT IN THE UK

6.1 EQUITY IMPACT OF CESSATION INTERVENTIONS

Overall, 34 of the 43 papers presented a total of 60 analyses comparing different measures of intervention effectiveness across one or more socioeconomic groups, thereby allowing some assessment of equity impact. The number of analyses increased the further downstream we moved along the cessation pathway, with only a handful (4) looking at assessment but a third looking at use (21) and a further third at success (23). Figure 15 summarises the equity impact ratings of these analyses. Only nine provided strong evidence of a positive equity impact, and these findings were seen proportionally more often for assessment, access, and use. Negative equity impact findings were, in contrast, proportionally more common for quitting success: here, just one of the 23 analyses presented indicated a clear equity positive effect[12] [H, ++], while 12 indicated a clear negative effect. A more detailed discussion of the findings, and particularly of the interventions that appear to have potential for reducing SES inequalities in cessation support, is provided in the narrative synthesis below.

FIGURE 15: SOCIOECONOMIC EQUITY IMPACT – SUMMARY FINDINGS



Assessment

Of the four papers reporting on the assessment stage of the cessation pathway, all focused on the extent to which smoking status was recorded in GP notes. Three articles looked at the impact of the Quality and Outcomes Framework (QOF), a pay-for-performance scheme[37] which remunerates GPs according to their performance across a range of indicators, including several smoking-related targets. A UK-wide study by Dhalwani et al[15] [H, ++] found strong evidence that, following the

introduction of QOF in 2004, recording of smoking status among pregnant women was most improved for patients resident in deprived areas. Taggar et al[37] [H/M, +] reported a similar pattern among all patients (again across the UK), although here the relative improvement in recording for the most compared to the least disadvantaged groups did not reach statistical significance. In contrast, an enhanced local form of the Quality and Outcomes Framework (QOF+),[21] which aimed to further incentivise GPs in one London borough to record smoking status, appeared to have a negative, rather than a positive, equity impact [H/M, -]. The final paper[19] examined the impact of the NHS Health Check in England. Among non-attenders, disadvantaged patients were less likely to have their smoking status recorded than their more affluent counterparts. No SES differences were found, however, among attenders, suggesting that the health check was successful in reducing inequalities in the recording of smoking status [H, +].

Access

Ten papers (12 findings) considered access to cessation support, with half looking at the provision of brief cessation advice within a primary care setting. National studies by Douglas & Szatkowski[18] [H/M, ++] and Taggar et al[37] [H/M, +] found that recording cessation advice was more common in the GP notes of smokers resident in the most (as opposed to the least) deprived areas of the UK, with the latter study showing that this equity positive effect became apparent after the introduction of QOF. There was, however, some variation across patient subgroups: Hardy et al[22] [H/M, ++] demonstrated higher levels of recorded advice among disadvantaged pregnant smokers in UK, but Blane et al[8] [H/M, -] reported the reverse socioeconomic pattern, with lower levels of advice being recorded for disadvantaged patients diagnosed with coronary heart disease in Scotland. Moreover, the enhanced QOF+[21] in one London borough [H/M, o/-] had a neutral equity impact among males but a negative equity impact among females.

Other authors looked at the extent to which smokers engaged with more innovative cessation interventions, three of which were linked to the standard NHS stop smoking services. Gilbert et al[20] [M, -] conducted a randomised controlled trial of a tailored communications intervention in which smokers across England were sent personalised risk information from their GP, together with an invitation to attend a no-commitment taster session at their local SSS. Although this intervention was successful in increasing attendance at the first full session of the SSS course, the level of improvement was greatest among more affluent smokers. Two further studies focused on local interventions delivered within the East Midlands region, one involving a mobile stop smoking service (MSSS) which toured around deprived areas in Nottingham city[42], and the other an incentives scheme for pregnant smokers attending an antenatal clinic at Chesterfield Royal Hospital who were referred to the local SSS.[26] The first of these[42] [M, ++/o] gave mixed results according to the SES indicator used. The proportion of clients from routine and manual occupations was higher for the MSSS than for the standard stop smoking service, but there was no difference in the proportion of low SES clients when using the index for multiple deprivation or prescription exemption as a measure of SES. Ierfino et al's[26] [M, o] study of the incentives scheme for pregnant smokers, likewise, found that IMD did not predict enrolment in the scheme.

Beyond these SSS-linked innovations, two papers explored smoker engagement with cessation support delivered through digital platforms. These were a smartphone app containing evidence-based cessation information[7] [L, ?] and a website for pregnant smokers offering tailored support similar to that provided by NHS stop smoking advisors[23] [L, ?]. In both these papers, SES data on access were descriptive and non-comparative, limiting any assessment of equity impact.

Use

Papers on use looked at three distinct aspects of the cessation pathway: making a quit attempt; using behavioural support or pharmacotherapy to assist in a quit attempt; and treatment adherence. Seven articles examined the proportion/number of quit attempts by SES, with an approximately even split between those evaluating the standard NHS stop smoking services and those evaluating new interventions. National data from three high value reports[17,27,32] [++(1); +(2)] and one medium/low value paper[43] [+] found that the established services in England, Scotland and Northern Ireland were successful in attracting more low SES smokers than high SES smokers. In stark contrast, all three innovative interventions appeared to have a negative equity impact. Two such papers assessed local incentive schemes aimed at helping pregnant women to quit. Ierfino et al[26] [M, --] reported that, among smokers who signed up with the incentive scheme at the Chesterfield Royal Hospital, disadvantaged participants were less likely than affluent participants to make a quit attempt. Similarly, Radley et al[34] [M/L, -] found that the proportion of pregnant smokers making a quit attempt with a pharmacy-administered incentive scheme was lower in the most, compared to the least, deprived areas of Tayside. The remaining article[41] [M/L, -] involved a preliminary evaluation of SmokeFree28 (a freely available stop smoking app) in which app users were contrasted with a broader sample of recent quitters from the English Smoking Toolkit Study (a nationally representative population survey: Fidler et al, 2011). Here, a greater proportion of the app users than the population sample came from higher SES, non-manual occupation groups.

Ten papers focused on the extent to which quitters made use of behavioural support and/or pharmacotherapy in their quit attempt. Within a primary care setting, disadvantaged smokers with a coronary heart disease diagnosis in Scotland[8] [H/M, ++] and pregnant smokers in the UK[16] [H, ++] were more likely than affluent smokers to be issued with a prescription for NRT. Douglas & Szatkowski[18] [H/M, ++] also found that low SES smokers in the UK were more likely to be prescribed cessation medication of any kind. Analyses of stop smoking service clients in England, however, showed that varenicline use was less common in low SES smokers, both overall[25] [H/M, -] and among those using either varenicline or combination NRT[10,11] [H, --(1); H/M, --(1)]. Hiscock et al[24,25] also looked at patterns of engagement with different types of behavioural support among English SSS clients. One study[25] [H/M, -] found that the proportion of clients from a disadvantaged background was higher for drop-in services than for the more effective group support, and the other[24] [H/M, ?] indicated that the patterns of engagement were similar across socioeconomic groups (although this was not subject to formal statistical testing). Two further articles[5,29] [L, ?(2)] examined English Smoking Toolkit Study data on the use of cessation medications and behavioural support in the general population, but neither focused specifically on SES differences, making it difficult to draw any conclusions about equity impact. The only innovative intervention looked at the use of NRT for relapse prevention[40] [M/L] within a single area in England (Nottingham) and gave mixed results with respect to equity impact: SSS clients from managerial/professional occupations were less likely than routine and manual workers to continue taking NRT [+] but so were unemployed clients and those who had a prescription exemption [--].

The final two papers looked at aspects of treatment adherence, with both reporting worse outcomes for low SES groups. Brose et at[11] [H, --] found that disadvantaged clients of the NHS stop smoking services in England were less likely to attend the follow-up appointment at four weeks post-quit. Moreover, Radley et al[34] [M/L, --] showed that, among pregnant users of the Tayside financial incentives scheme, those living in the most deprived areas were less likely to receive an incentive

payment, meaning that they had either relapsed before, or failed to attend, their first post-quit assessment.

Success

The majority (21) of papers which examined the equity impact of a cessation intervention focused on quit success, with just over half of these articles looking at quit rates among clients of the established stop smoking services. In addition to the three national statistics releases covering all services in England[32] [H], Scotland[27] [H] and Northern Ireland[17] [H], a further six papers presented data for England based on a sample of services[4,9,10,11,24,25] [H (2), H/M (4)]. Here, the equity impact of the services was almost exclusively found to be negative when assessed across a number of different time points (ranging from 4 to 52 weeks) and SES measures. The one exception to this was a paper by Brose et al[9] [H/M, o/--] who limited their analysis to clients who received one-to-one support, finding that CO-validated quit rates at 4 weeks did not vary by IMD (although a negative equity impact was reported for NS-SEC occupational status). Two additional papers focused on a single service within a deprived area. Bauld et al[3] [H, --] looked at longer-term outcomes at 52 weeks among users of drop-in rolling group service in Liverpool, once again finding that quit rates fell with increasing disadvantage. McAlpine et al[31] [L, ?] presented data on clients of the Whitechapel SSS, but the descriptive nature of the analysis made it difficult to discern a clear pattern by socioeconomic status.

Studies of more innovative interventions demonstrated greater variation in their findings, with several showing some evidence of an equity positive impact. The most promising of these was the StopAdvisor website[12] [H, ++], developed with input from disadvantaged smokers, and designed to emulate the stop smoking services as a source of tailored cessation support. In an RCT involving separate randomisations by SES, low SES participants who used the StopAdvisor website had higher quit rates than who used a control information-only website; no intervention effect was reported in high SES smokers. This equity positive impact was not, however, apparent for other digital interventions. In a pilot study of the MumsQuit website (adapted from StopAdvisor to meet the needs of pregnant smokers), occupational status did not influence quit outcomes, although it is unlikely that this small pilot was adequately powered to detect differences by SES[23] [L, ?]. Moreover, the SmokeFree28 smoking cessation app was found to have a negative equity impact, with users from non-manual occupational groups having higher quit rates than manual workers[41] [M/L, --].

While the evidence was not quite as strong as that for StopAdvisor[12], Bennett et al[6] [M, +] provide some support for the use of tailored communications in helping to reduce inequalities. They conducted a national RCT of a computer-tailored advice report on quitting smoking that was matched to the reading level of the smoker and delivered with an endorsement letter from their GP. This study found that the intervention effect on abstinence rates at three months was higher in the easy reading group than the standard reading group. Wide confidence intervals meant, however, that this difference was not statistically significant. This contrasted with the findings of Gilbert et al, who combined personalised risk information with an invitation to an English stop smoking service taster session[20] [M, -]; here, though, the intervention effect appeared greater in the least deprived areas than in the most deprived areas.

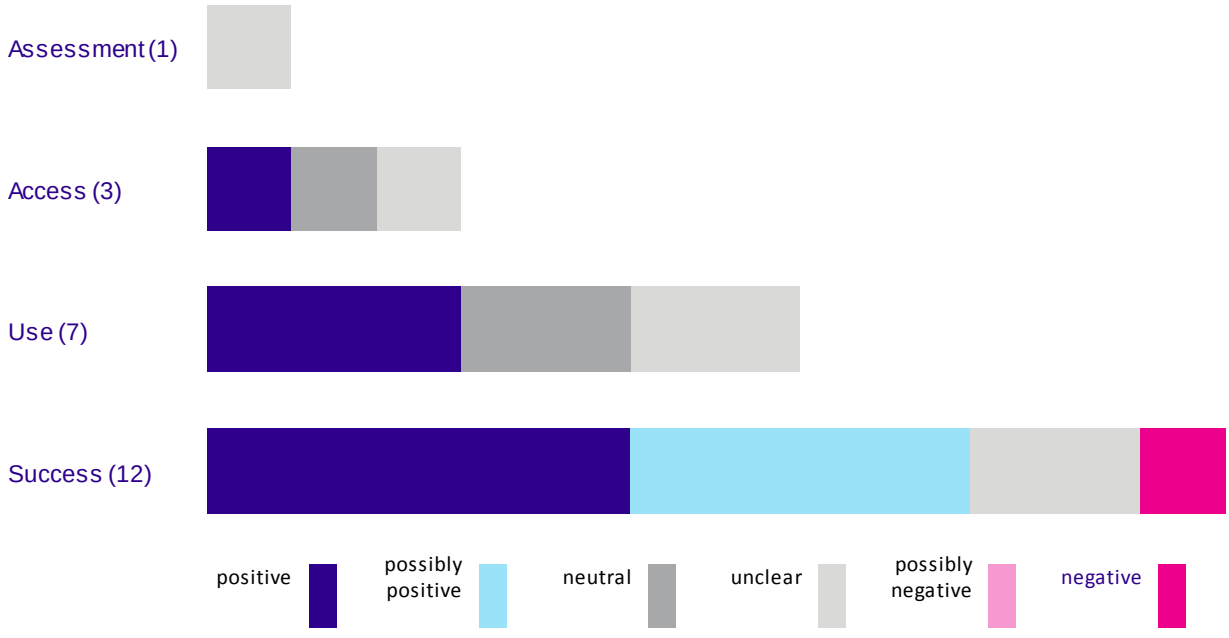
The final paper to suggest a positive equity impact in relation to quit success was that by Venn et al[42] [M, +], which evaluated the performance of the Nottingham-based mobile stop smoking service (MSSS), finding higher CO-validated quit rates at four weeks among routine and manual workers than among all clients. Interpretation of this data is, however, complicated by two issues: the 'all clients' group included the long-term unemployed and those who have never worked; quit rates for the MSSS were lower across both groups than those for the standard SSS in the same area. Four further

papers also looked at innovations within the context of the stop smoking services. The two financial incentive schemes for pregnant smokers previously described (Radley et al[34] [M/L, -], Ierfino et al[26] [M, --/-]) each demonstrated lower quit rates in low compared to high SES groups. A randomised controlled trial (RCT) of a pack of relapse prevention booklets among SSS clients in the East of England[30] [H/M, o] found that the intervention was no more effective than a commonly used leaflet, and that this was the case for both more and less disadvantaged service users. Similarly, an RCT of bupropion and NRT singly and in combination[36] [L, ?], conducted in four SSS in South East England, reported no differences in quit rates across the three treatment arms and found no evidence of an interaction between SES and treatment type, although this study is likely to have been underpowered to detect differences by SES.

6.2 EFFECTIVENESS OF INTERVENTIONS TARGETED AT LOW SES GROUPS

Studies focusing on interventions that were targeted at deprived smokers were less common, with just over one-third of papers (16) reporting on interventions that were either developed for, or delivered within, disadvantaged groups. Moreover, very few articles looked at assessment (1) or access (3), limiting our ability to examine experiences across the cessation pathway (Figure 16). As a result, the findings are grouped primarily by intervention type, although reference is still made within the narrative synthesis to the stage of the cessation pathway covered. Papers were roughly evenly split by intervention type, with five focusing on specialist SSS (or variants of these services), a further four looking at financial incentive schemes, and the final seven assessing innovative interventions delivered in non-standard settings. While all 16 papers considered here addressed interventions that were in some way targeted at disadvantaged smokers, seven additionally provided data broken down by SES and, thus, also appear in the analysis of equity impact above. It is also worth reiterating that, in contrast to the above section on equity impact, a positive finding in relation to a targeted intervention means that better outcomes were reported for the intervention than for a control or internal/external comparator.

FIGURE 16: EFFECTIVENESS OF TARGETED INTERVENTIONS – SUMMARY FINDINGS



Turning first to the SSS papers, two articles examined rates of quit success for established stop smoking services situated in disadvantaged areas of England: these were Fag Ends, a drop-in rolling-group model of cessation support in Liverpool and Knowsley[3] [H, ?], and a service in Whitechapel (London) offering a range of support types, including individual appointments, drop-in clinics and group sessions[31] [L, ?]. For the Fag Ends service, a comparison of quit rates at 12 months with those reported by other studies and systematic reviews across a range of socioeconomic profiles gave a mixed pattern of results; the Whitechapel paper did not include comparators, making it impossible to draw any conclusions regarding intervention effectiveness. Kassim et al[28] [M, +], in contrast, evaluated a variant of the standard SSS model, examining a community outreach cessation service for smokers of Bangladeshi origin who were resident in Tower Hamlets (an area of London with high levels of social deprivation), where clients were offered one-to-one support in their native language from gender-matched community workers. Here, CO-validated quit rates at four weeks were found to be higher than those for clients attending the standard Tower Hamlets SSS, although no formal statistical comparison was presented.

The remaining two SSS papers both reported on the mobile stop smoking service previously described, with one concentrating on a quantitative evaluation[42] and the other covering a qualitative exploration of clients' experiences of accessing the MSSS[2]. In relation to access and use, Venn et al[42] [M, o/o] showed that the registration rate per advisor hour and the proportion setting a quit date were similar across the mobile and the standard services, despite the MSSS's focus on disadvantaged areas of Nottingham. These results were supported, moreover, by Bains et al[2] [M], who found that the mobile service was generally seen as being more accessible since it was based in convenient locations (near to where clients lived, worked and shopped), it used a flexible drop-in system rather requiring appointments (thereby avoiding lengthy delays), and it was more informal and less intimidating (because it was delivered in a non-health care setting). Overall quit outcomes at four weeks[42] [M, --] were, nevertheless, significantly lower for the MSSS than for the standard service (18.3% vs 33.5%, $p<0.001$), although the size of this difference was somewhat reduced when focusing solely on the target group of routine and manual workers (all clients: 15.2%; RM: 8.7%).

Of the four papers evaluating financial incentive schemes, three involved interventions targeted at pregnant women resident in disadvantaged areas of the UK. Results in relation to access and use were mixed. Radley et al[34] [M/L, ++] claim that the proportion of pregnant smokers making a quit attempt with a pharmacy-based incentive scheme in Tayside was higher than that reported in a systematic review of non-incentive specialist cessation services for pregnant women across Scotland. In contrast, an RCT carried out by Tappin and colleagues[38] [H/M, o], and administered through stop smoking services in the Greater Glasgow and Clyde area, suggested that the proportion of participants setting a quit date was similar across intervention (incentive scheme) and control (routine care) arms. The third study by Ierfino et al[26] [M, ?] in Chesterfield (see above) provided summary statistics on access (enrolment in scheme) and use (making a quit attempt), but did not include a comparator. All three papers presented positive findings in relation to quit success, with the Tayside scheme[34] [M/L, ++] achieving better CO-validated quit rates at four weeks than the comparator systematic review, the Glasgow trial[38] [H/M, ++] reporting higher cotinine-verified rates of abstinence in the intervention compared to the control arm both during late pregnancy and at six months post-partum, and the Chesterfield scheme[26] [M, +] giving higher CO-validated quit rates at delivery than had previously been seen at the same hospital.

Beyond these studies of financial incentives for cessation in pregnancy, Ormston et al[33] [H/M] also looked at the effectiveness of a similar incentive scheme for all smokers living in the most deprived

areas of Dundee, which was delivered across a combination of pharmacy and non-pharmacy settings. Here, a series of telephone surveys and in-depth interviews with a sample of clients explored aspects of access (reasons for registering with the scheme), suggesting that the financial incentive was only one element in their decision-making process, with the ability to gain access to cessation support and to pharmacotherapy being equally important. Moreover, participants expressed wide-ranging views in relation to the financial incentive itself, with some admitting that it had been their main reason for registering with the scheme, and others claiming that it had played no part in their decision. Alongside this, Ormston and colleagues used routine monitoring data to compare the performance of the scheme with that of the existing stop smoking services in Scotland, taking into account differences in the sociodemographic profile of the clients. In terms of use, a large increase was seen in the number of quit attempts made with an SSS in the target areas of Dundee following the introduction of the scheme. However, since services in other parts of Scotland also reported similar increases in quit attempts, it was not possible to draw any conclusions about the impact of the incentive scheme on use [H/M, ?]. In contrast, findings were once again more positive in relation to quit success. Rates of self-reported abstinence were higher at 1, 3 and 12 months for clients of the incentive scheme compared to clients of all other Scottish SSS [H/M, ++], with the greatest difference being seen among clients receiving support in a pharmacy-based setting. Follow-up surveys and interviews at 12 months suggested that no single element of the scheme was viewed as being key in helping participants to stay quit, but rather it was the package as a whole that was perceived as being beneficial.

The final seven targeted papers (five studies) explored a range of different innovative interventions delivered in non-standard settings, reporting almost exclusively positive results. A set of three papers by Campbell and colleagues[13,14,35] evaluated an opt-out referral system for pregnant women who were resident in a disadvantaged area of the East Midlands; women attending a 12-week ultrasound scan at one of two antenatal clinics were offered CO testing, and those identified as smokers were automatically referred to their local stop smoking service unless they opted out. The quantitative component of the evaluation[14] [H/M, ++] demonstrated that the new referral system had a positive impact on all stages of the cessation pathway from access through to success, with the proportion of women who were referred to the SSS, who set a quit date with the service and who self-reported being quit at four weeks all significantly higher after implementation of the scheme than before. Semi-structured interviews with women who attended an ultrasound scan during the study period[35] [H/M] and with staff involved in the delivery of the scheme[13] [H/M] explored issues around the acceptability and impact of the opt-out scheme. In relation to assessment, the majority of women felt that CO testing was simply part of routine antenatal care, that it was quick and straightforward to take, and that it was delivered in a helpful and non-judgemental way. The health support workers responsible for administering the test similarly thought that its introduction had generally not impacted negatively on their relationship with the women, although high readings could generate considerable distress and anxiety. Some women did, however, suggest that being asked to take the test reflected a lack of trust between them and the support worker; some also felt that they had been given insufficient information about the test and their results. Perceptions with respect to the opt-out referral component of the scheme (access) were more variable. Women were evenly divided between those who welcomed the automatic referral because it would encourage and support them to quit, and those who were uncomfortable or resentful towards it because it took away their freedom to choose. Moreover, most of those who were referred were unaware of any attempts by the SSS to contact them, leading to feelings of frustration and disappointment as they were unable to capitalise on the high levels of motivation to quit generated by the CO test. Staff at the stop smoking

clinic felt that the new referral system provided encouragement to quit for those women who were already thinking about stopping. They also reported, however, that because of the increase in referrals, a greater proportion of women eventually decided to decline the support offered.

Beyond this, Thompson et al conducted a small pilot RCT of a reduction-to-quit intervention that provided behavioural support aimed at increasing physical exercise, as well as reducing smoking[39] [M/L]. This study was open to moderate to heavy smokers from two deprived neighbourhoods in the South West of England, and involved up to 12 one-to-one motivational sessions delivered by a health trainer either in person or by telephone. Here, the proportion making a quit attempt was significantly higher among participants receiving the intervention than among those receiving the control (brief advice plus information on the local SSS) [++]; CO-validated quit rates at four weeks were also substantially higher in the intervention arm (23.3% vs 6.5%) but the difference did not reach statistical significance [+]. Abbas et al[1] [L, ?] examined the effectiveness of a workplace health check aimed at low paid employees from two large government organisations based in disadvantaged areas of the North-East of England. While they presented descriptive data on the percentage of health check attendees who were referred to their local stop smoking service, no conclusions could be drawn about the impact of the intervention on access, as no comparators were provided.

In a slightly different approach, the last two papers considered interventions that had been designed specifically for disadvantaged smokers, but which were evaluated by comparing effectiveness across low and high socioeconomic groups. Although these studies have already been described in section 6.2, here we concentrate solely on the results for the target disadvantaged group. Thus, in the randomised controlled trial of the StopAdvisor website[12] [H, ++], low SES smokers (routine and manual workers, long-term unemployed or never employed) who had access to the full website offering tailored support had higher cotinine-verified abstinence rates at 6 months than smokers who had access to an information-only website. Bennett et al[6] [M, +], moreover, found some evidence that, among smokers whose reading level was rated as “easy” (defined by the authors as being qualified to GCSE standard or lower and as opting to read tabloid (as opposed to broadsheet) newspapers), computer-tailored cessation advice matched to reading ability may lead to improved rates of self-reported abstinence at 3 months when compared to the standard NHS stop smoking leaflet, although this improvement did not reach statistical significance.

7 DISCUSSION

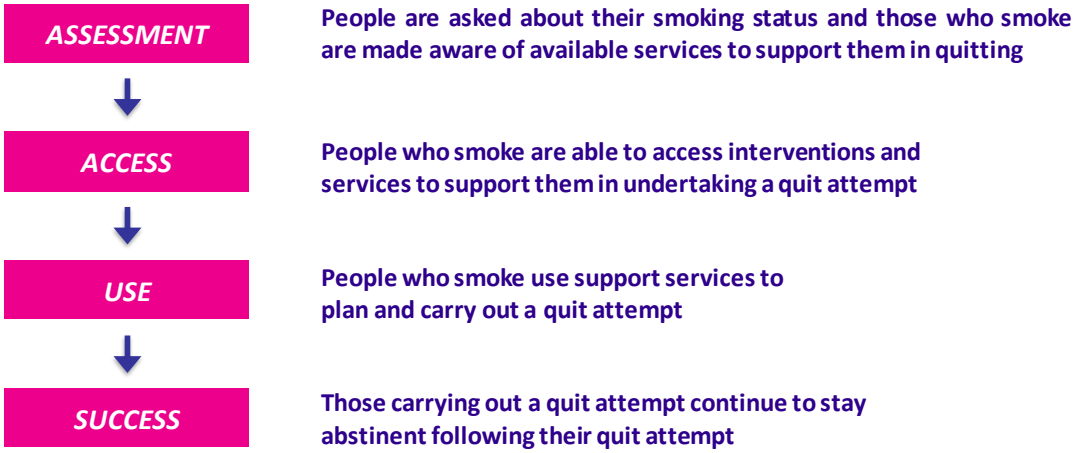
Over recent years, patterns of socioeconomic inequality in smoking prevalence have been broadly consistent across the UK as a whole and within the constituent nations. National surveys show that smoking prevalence is highly associated with socioeconomic status, with rates of smoking being highest in the most disadvantaged groups, across a range of SES measures (i.e. occupational status, household income and deprivation). While smoking prevalence has been falling in most SES groups, there is little evidence (apart from possibly in Scotland) that the gap in smoking rates has narrowed between the least and most disadvantaged groups in recent years.

While this report focuses on the equity impact of cessation support services, it is important to bear in mind that the UK’s social gradient in smoking is primarily driven by inequalities in people’s social and economic circumstances – i.e. inequalities in the social determinants of health (Graham, 2007). Progress in reducing smoking inequalities therefore requires a multi-pronged approach that seeks to address inequalities in these broader determinants and the pathways via which they contribute to

greater smoking uptake and lower quit rates among those from low SES groups. Cessation support is an important part of this approach, but efforts to improve the equity impact of cessation services are unlikely to be effective unless accompanied by more 'upstream' interventions – including measures addressing price and taxation, physical and social environments (Brown et al, 2014b; Hill et al, 2014), industry activity (Collin & Hill, 2015) and socioeconomic inequality itself.

Turning to this study and its evaluation of the equity impact of cessation support, we found that such support tends to have an equity positive effect in the early stages of the cessation support pathway (Figure 17) but that this impact shifts towards an equity negative effect as smokers move along the pathway. In other words, low SES smokers are more likely to have their smoking status assessed and to be offered cessation support, but are less likely to successfully quit smoking as a result of this support. This pattern fits with the findings of previous research, which has shown that individual-level cessation interventions achieve consistently lower success rates for low SES smokers (Brown et al, 2014) but that NHS stop smoking services are able to compensate for this via targeting to achieve higher reach in low SES communities (Bauld et al, 2007; Galbraith et al, 2012). Our review indicates that a similar pattern is seen in relation to cessation support via general practice, where equity targets are associated with greater service reach to smokers from low SES groups, although these smokers continue to face barriers to successful quitting. These findings point to the strengths of NHS-based support in terms of reaching low SES smokers but also highlight the challenges involved in effectively supporting low SES smokers to quit.

FIGURE 17: THE CESSATION PATHWAY



7.1 NATIONAL EQUITY ANALYSIS OF NHS STOP SMOKING SERVICES

In relation to evaluation of NHS stop smoking services, there is a strong (equity-positive) socioeconomic gradient in SSS-supported quit attempts, with the largest number of quit attempts occurring among the most disadvantaged smokers. There has been a substantial decline in quit attempts since a high point in 2011/12. This decline was apparent across all countries, but was perhaps most marked in England. The population quit attempt rate (i.e. the proportion of all smokers who make a quit attempt with a cessation service) in Scotland has exceeded that in England since the

introduction of the deprivation-based HEAT target (Scottish Government, 2014) in 2011.[i] In the last two years (2015-17), the gap has widened further and the Scottish rate is now 40% higher than the English rate (6.43% vs 4.56%), while population quit attempt rates for Northern Ireland have remained between those for England and Scotland throughout the five-year period 2011/12 to 2015/16. The decline in quit attempts does, however, appear to have been similar across all SES groups. As a result, the socioeconomic gradient in favour of disadvantaged smokers remains. In Scotland, and probably also in Northern Ireland, this gradient translates into a relatively higher population quit attempt rate for the most deprived groups. An equivalent analysis for England was inconclusive, however, due to inconsistencies in the recording of SES across different data sources.

Several factors may have contributed to these declines in SSS-supported quit attempts. Firstly, levels of investment in the SSS in England, and in the mass media campaigns promoting cessation in Scotland, have fallen in recent years due to wider constraints on public spending (CRUK, 2016; Reid et al, 2017). This has been coupled with a reorganisation of public health services in England which led to responsibility for the SSS being transferred from the NHS to local authorities in 2013 (CRUK, 2016). A survey carried out by CRUK and ASH in 2017 found that smoking cessation budgets in England had been cut in 50% of local authorities in 2017, which follows cuts in 59% of local authorities in 2016 (CRUK, 2018). As of 2017, only 61% of local authorities commissioned a specialist stop smoking service that could be accessed by anyone.

Alongside these organisational and investment changes, there has been a dramatic increase in the use of e-cigarettes in the UK over recent years. The 2016 Opinions and Lifestyle survey found that 13.7% of current smokers and 12.1% of ex-smokers in Great Britain reported current use of e-cigarettes (ONS, 2017C). An analysis of English survey data from 2010-2014 (Beard et al, 2016) found that while there was no change in overall self-reported quit attempts (with around 30-40% of smokers continuing to report a quit attempt in the past year), increased use of e-cigarettes was associated with a decline in use of prescribed NRT. While these findings suggest that e-cigarettes may be (to some extent) replacing more conventional forms of nicotine replacement therapy, Beard et al (2016) found no clear evidence of an association between increasing e-cigarette use and the decline in quit attempts made via SSS. The authors also reported a significant but small positive association between use of e-cigarettes during a quit attempt and the success of self-reported quit attempts, such that for each percentage point increase in e-cigarette use during a quit attempt the success rate increased by 0.06%.

While we cannot positively identify the causes of the observed decline in SSS-supported attempts, the coincidence of this decline with a rise in e-cigarette use raises the possibility that the two trends are linked. It seems plausible that a proportion of smokers are turning to e-cigarettes to help them quit conventional cigarettes without receiving formal cessation support via either SSS or primary care providers. The net impact of these observed trends on smoking prevalence is unclear, and there is currently no direct evidence of how these changing patterns might affect socioeconomic inequalities in smoking. While evidence from the academic literature suggests that e-cigarette awareness and use was originally higher among more advantaged smokers (Hartwell et al, 2016), more recent data – such as that from the 2016 Scottish Health Survey (Scottish Government, 2017) and the English Smoking Toolkit Study (West et al, 2018) – suggests that smokers from disadvantaged social groups

[i] Set by the Scottish Government, the HEAT target was to achieve, between 2011 and 2014, at least 80,000 successful quits (at 4 weeks post quit) including 48,000 in the 40% most-deprived SIMD areas. This target was more than achieved, with over 70,000 successful quit attempts recorded in the most deprived areas over this three-year period (Scottish Government, 2014).

are just as likely to use e-cigarettes in quit attempts as those from more privileged social groups. Given the evolving landscape of e-cigarette use, it will be important to evaluate the impact on socioeconomic inequalities in cessation and smoking prevalence.

Patterns in quit success rates show notable geographical variation. In England, the proportion of SSS clients who remain abstinent for at least four weeks has remained broadly steady over recent years, whereas in Northern Ireland the proportion has increased (having started at much the same level as England, the proportion of successful quits is now slightly higher for SSS in Northern Ireland). Socioeconomic differences in SSS quit rates were similar in both countries and were consistent across time, with disadvantaged smokers being less successful than affluent smokers in remaining abstinent. In contrast, SSS short-term quit rates were not only much lower in Scotland, but the gap between low and high SES was also much higher (although the direction of difference was the same). Population quit success rates (i.e. the proportion of all smokers who make a successful quit attempt) have been consistently higher in Northern Ireland, while those for England and Scotland have converged in recent years. For the first time in 2016/17, population quit success rates now appear to be marginally higher in Scotland than in England, reflecting the less severe decline in recruitment to stop smoking services in Scotland.

Ever since the SSS were established in the UK, it has been recognised that there is considerable variation in the impact of these services, in terms of both reach and quit rates. Indeed, this was mentioned by several of the papers included in this review. It has therefore been argued that SSS have not reached their full potential and that services could learn from each other in order to optimise their impact. Indeed, this was one of the reasons for establishing the English national centre of excellence (NCSCT) to provide training for cessation specialists. The 2014 review of stop smoking services in Scotland found that population reach ranged from 6% to 29%, and quit rates from 28% to 55%, between different SSS (NHS Health Scotland, 2014). This produced a four-fold difference in quits per 100 smokers, from 2.4% to 10.4%. However, the continuing decline in quit numbers and rates found in this review indicates that the full potential of SSS has yet to be achieved.

7.2 SYSTEMATIC REVIEW OF SOCIOECONOMIC INEQUALITIES IN CESSATION SUPPORT IN THE UK

In relation to the equity impact of other forms of cessation support, evaluations primarily focused on established services (e.g. general practice-based health checks). Within primary care, existing services (both routine care and specific initiatives such as the NHS Health Check and QOF) generally look to intervene at the early stages of the cessation pathway. Overall, the evidence in relation to primary care demonstrated a clear equity positive effect on the ascertainment of smoking status, the delivery of brief cessation advice, and the provision of stop smoking medication. Thus, smokers from low SES groups were more likely to be asked about their smoking and to be offered cessation support than high SES groups. It should be noted, however, that none of the primary care studies used data collected after 2012. There was, moreover, a lack of evidence around the quality of interventions (particularly in relation to cessation advice), with several authors[22,37] highlighting how a reliance on routine clinical data limited the ability to assess intervention effectiveness.

Specialist SSS are, in contrast, more directed towards the end of the cessation pathway. Here, the equity impact appeared to shift from positive to negative as smokers moved along the pathway. There was consistent evidence that the SSS attract a higher number of disadvantaged smokers, with

national-level data showing that smokers making a quit attempt with the services are more likely to come from lower occupational groups (England) and from deprived areas (Scotland and Northern Ireland). Population quit attempt rates for Scotland also demonstrated an equity positive effect, indicating that the Scottish SSS are successfully targeting the least advantaged groups. As noted above, the equivalent equity analysis of population quit attempt rates for the English services was inconclusive.

Studies of the specific types of cessation support used were typically less positive, showing that disadvantaged SSS clients were more likely to use NRT in their quit attempt and less likely to use the more effective varenicline, although the picture with respect to behavioural support was less clear. There was also strong evidence that low SES service users were less likely to be successful in their quit attempt than high SES service users, a finding that is consistent with previous reviews (Brown et al, 2014: Hill et al 2014). This may be due, in part, to the fact that low SES clients are more likely to drop out of SSS early than high SES clients (i.e. they have lower rates of both adherence to treatment and retention) (Hiscock et al, 2011). Only two studies in this review looked at aspects of treatment adherence, and both reported poorer outcomes for low SES groups.[11,34] A study of English SSS found that disadvantaged clients were more likely to have dropped out by 4 weeks post-quit,[11] and disadvantaged pregnant smokers in a local incentive scheme were less likely to receive an initial incentive voucher.[34]

Taken in isolation, this appears to suggest that the SSS may have had a negative impact on smoking inequalities (that is, they may have exacerbated existing inequalities in smoking by SES). The analysis of population quit success rates for Scotland (and Northern Ireland), however, indicates that targeted recruitment of disadvantaged smokers by the Scottish SSS offset the lower service quit rates, leading to an overall positive equity effect on quit success rates at the population level. It remains unclear whether this is also the case in England. In Scotland, the HEAT targets for SSS have focused on achieving a set number of 4-week quits in low SES groups. The English SSS throughput targets have had no inequalities focus. English SSS were first established in areas of deprivation (Health Action Zones) and the early emphasis on supporting more disadvantaged smokers to quit remained as they were rolled out across the country (Hiscock and Bauld, 2013). However, concern has been expressed that the English targets, by only assessing overall throughput, reduced the likelihood of low SES smokers, with their lower quit rates, being sought out and/or supported appropriately for long enough (Raw et al, 2005; McNeill et al, 2012).

While less common, about one-third of papers examined more innovative approaches to providing cessation support. These were wide-ranging in nature, covering adaptations of established services (e.g. no-commitment SSS taster sessions), as well as interventions delivered in less traditional settings (e.g. through digital platforms). Several of these innovations appeared to have a positive equity impact. These are discussed in more detail below, but it is worth noting here that, overall, there was some evidence that tailored interventions (i.e. those specifically designed to meet the needs of disadvantaged smokers) were more successful than non-tailored interventions. As the evidence base for each intervention was limited to a single study, further research is required to confirm their effectiveness across other groups and settings. Additional qualitative research would also help to elucidate the mechanisms through which these innovations might operate.

7.3 MEASURES THAT MAY HELP REDUCE SOCIOECONOMIC INEQUALITIES IN CESSATION SUPPORT

Taken together, the available evidence indicates that established SSS have played a role in reducing socioeconomic inequalities across the cessation pathway. Primary care services have had a positive impact on the early stages of pathway, with low SES groups more likely to have their smoking status assessed and to be offered cessation support. Some studies suggest that primary care engagement with disadvantaged smokers is particularly strong in the presence of target-based systems (such as the NHS Health Check and QOF) which aim to improve preventive assessment among patient populations. It is also possible that the socioeconomic gradient in such support may be explained, at least in part, by the higher prevalence of chronic health conditions among lower SES groups, necessitating more frequent GP visits.[37] Further research is required to address this issue, as well as to confirm whether primary care services continue to have an equity positive effect (the most recent data was for 2012), particularly in Scotland, as in 2016 QOF was ended, with the money being re-allocated to core funding primary care teams. Further research is also needed to assess the quality, not just the quantity, of delivered interventions.

NHS SSS, on the other hand, appear to have contributed to reducing SES inequalities in the penultimate stage of the cessation pathway (use of cessation support), although the impact on the final state (successful quitting) is more equivocal. National statistics releases indicate that the SSS in England, Scotland and Northern Ireland consistently recruit higher numbers of disadvantaged smokers (no data are available for Wales). In Scotland (and recently Northern Ireland), this translates into a positive equity impact on population quit attempt rates, with a higher proportion of low SES smokers than high SES smokers being supported to make a quit attempt by a cessation service. SSS quit success rates were, in contrast, lower among disadvantaged smokers across all three countries. Evidence from previous studies suggests that low SES smokers face particular barriers to successful quitting – including higher levels of dependence, positive smoking social norms, and difficult or challenging life circumstances including socioeconomic disadvantage (Caleyachetty et al, 2012; Hiscock et al, 2011; Hiscock et al, 2012; Hiscock & Bauld, 2013; ASH, 2016). As mentioned previously, low SES smokers also tend to drop out of cessation services at an earlier stage, and so are less likely to benefit from the support available to help them overcome these barriers (Hiscock et al, 2011). National data suggests, however, that the introduction of deprivation-based HEAT targets in Scotland from 2011 (Scottish Government, 2014) has nevertheless helped Scottish SSS to play a part in reducing inequalities in cessation, with greater levels of uptake among disadvantaged smokers compensating for lower quit rates in these groups.

This review also points to a number of innovative interventions which hold potential for reducing socioeconomic inequalities in cessation. Two such innovations were tailored to meet the particular needs of disadvantaged smokers, but were implemented across low and high SES groups, allowing an assessment of the likely equity impact. The StopAdvisor website[12] was designed, with input from disadvantaged smokers, to emulate the type of behavioural support provided by specialist cessation services. Bennett et al,[6] in another approach, evaluated a primary care intervention in which smokers were sent written cessation advice from their GPs which was tailored to their reading level. Among low SES smokers, both innovations led to higher quit success rates than those reported for the control intervention. No such effect was seen, however, among high SES smokers, although quit

outcomes in these smokers were still higher. Thus, these innovations were successful in reducing, but not eliminating or reversing, SES inequalities in cessation outcomes. A further non-tailored extension of an existing SSS[40] also showed promise in relation to use, with disadvantaged service clients more likely to accept the offer of an extended course of NRT for relapse prevention than their high SES counterparts.

Several other studies highlighted the potential of targeted interventions (i.e. interventions focused solely on low SES smokers). While these studies revealed nothing about the equity impact of the interventions, they did identify a number of innovative approaches that may help to improve cessation-related outcomes within disadvantaged groups, namely:

- A system of CO-validated identification[13,14,35] of pregnant smokers within an antenatal clinic, with opt-out referral to a local SSS, which resulted in higher rates of referral, quit attempts and quit success than those previously seen at the same clinic.
- A reduction-to-quit intervention[39] based around encouraging an increase in physical exercise, which found improved results in relation to quit attempts and outcomes when compared to the control (usual care) intervention.
- A community-based outreach SSS for Bangladeshi smokers[28] which reported higher quit success rates than the standard stop smoking service for the same area.

A more complex picture emerged, though, in relation to two further types of targeted innovation, financial incentives and mobile SSS. Four studies looked at the effectiveness of financial incentive schemes, with three focusing on pregnant disadvantaged smokers[26,34,38] and one covering all disadvantaged smokers.[33] Despite differences in the set-up and delivery of these schemes, they all demonstrated higher quit success rates than those reported for a range of other comparator interventions (in similar populations), suggesting that they are likely to be effective within low SES groups. The Give It Up For Baby scheme[34] also found an increase in quit attempts compared to other non-incentive cessation services for pregnant women. Two of the studies[26,34] went on, however, to compare intervention outcomes across more and less affluent smokers within their target deprived populations, finding a negative equity effect in relation to use and success. Further work is needed, therefore, to establish whether, like the StopAdvisor website[12] and the literacy-matched cessation materials[6], incentive schemes might be able to reduce (rather than overcome) SES inequalities in cessation.

Finally, the pattern of results in relation to a mobile stop smoking service targeted at low SES smokers (MSSS)[42,2] was somewhat different again. Compared to the standard SSS covering the same location, the MSSS achieved similar rates of access and use despite its focus on the most disadvantaged areas of the city. Clients were also more likely to be from routine and manual occupations, and to be first-time users of a cessation service, indicating that the MSSS was successful in attracting smokers from a more 'hard-to-reach' group. Quit success rates for the MSSS were, in contrast, considerably lower than those for the standard service. Intriguingly, quit rates were higher among routine and manual workers than they were among all clients, suggesting that the MSSS might be more effective in low SES smokers than high SES smokers, but less effective than the standard service across all groups.

7.4 STUDY STRENGTHS AND LIMITATIONS

Our national equity analysis of the impact of the NHS stop smoking services builds on the approach described by Bauld et al (2007). This approach has a number of advantages in that it not only seeks to assess SSS equity impact on cessation levels in the total population of smokers, but it also recognises the contribution of both service recruitment levels (quit attempts) and intervention effectiveness (quit success) in determining the extent of this impact. The approach does not, however, make any adjustment for underlying socioeconomic differences in quit attempt and quit success rates among smokers who look to quit without formal cessation support (i.e. the method does not include a control group comparator). Latest survey estimates from the Smoking Toolkit Study (West & Brown, 2018) suggest that, among all smokers in England, quit attempt rates are no higher (and indeed may be lower) in manual occupation groups (C2-E) compared to professional/clerical groups (A-C1). While equivalent data are not available for Scotland, these figures do suggest underlying socioeconomic differences are unlikely to explain the equity-positive impact of the Scottish services, since SES trends in SSS-supported population quit attempt rates (the main driver of the observed positive equity effect for Scotland) do not appear to be mirrored among all smokers.

The systematic review component of this study identified 40 peer-reviewed articles and three national SSS (collated) reports published since 2012 that provided evidence on experiences of cessation support by SES in the UK. As noted in previous reviews (Brown et al, 2014; Hill et al, 2014), most evaluations of smoking cessation do not include data on SES. This was particularly evident here in relation to the grey literature, where the only studies found containing data on SES were the annual national statistical releases for the NHS specialist SSS. Quality appraisal of the peer-reviewed papers also suggested that nearly half the studies had not been designed with the primary aim of evaluating the experience of cessation support by SES, although evidence on this relationship was examined as a secondary objective. This was reflected in the significant proportion of studies that were judged to be of medium or medium/high value to the review (Table 4). Most of these studies were of high quality in relation to their primary research question, but had limitations (such as low statistical power, lack of (adequate) comparators and limited data on the quality of interventions) for examining the relationship between cessation support and SES.

In undertaking this review, we sought to be as comprehensive and inclusive as possible, using a broad range of search terms and study designs to identify interventions aimed at supporting each step of the cessation pathway (not just the actual quit itself). Our focus, here, was on cessation support interventions rather than on broader initiatives that looked to bring (disadvantaged) smokers into greater contact with general health services. Despite our comprehensive search strategy, it is possible that relevant studies were not included because their title or abstract did not include a key search term. While the number of studies overlooked is unlikely to be high, we are aware of several relevant papers that were not included. One reported the findings of a programme in England which aimed to increase referrals to SSS using Children's Centres and smoke-free family schemes (McEwen et al, 2012), but which did not mention SES in the title or abstract. The other detailed the txt2stop randomised trial (Free et al, 2011), but which was excluded because it fell outside our search period. Finally, it is possible that there were regional- or local-level analyses of SSS and/or cessation initiatives that either the stakeholders who were contacted in this project were unaware of, or that had not been formally written up.

It is also important to note that of the 43 papers included in this review, only three used an entirely qualitative approach with another three adopting a mixed-methods design. This limits our ability to

explore the reasons *why* particular approaches are more or less likely to have an equity-positive effect on smoking outcomes. While we have included such information within Chapter 6 where it available, there were insufficient data to present a separate analysis on the issue. Evidence from broader literature indicates, however, that smokers from less advantaged backgrounds face particular barriers to successful quitting (Hiscock et al, 2012), although further research is needed to understand why some forms of cessation support are better able to mitigate these obstacles.

8 IMPLICATIONS FOR POLICY, PRACTICE AND RESEARCH

8.1 OVERALL CONCLUSIONS

Smoking cessation services throughout the UK continue to make an important contribution to reductions in smoking prevalence, but current evidence shows these benefits are declining as fewer smokers use the services to quit, and are not shared equally across all socioeconomic groups. Our review highlights that smokers from disadvantaged backgrounds (including those with lower income and education, and/or living in more deprived areas) continue to demonstrate high levels of engagement with cessation support, but face additional barriers to successful quitting. Health services are generally successful in engaging with these smokers, inviting them to make use of cessation support services, and providing these services in an accessible way; however, cessation interventions themselves continue to be less effective for low SES smokers, resulting in lower quit rates and a potential exacerbation of inequalities in smoking prevalence.

There is currently very limited evidence on how these inequalities could be addressed via specific cessation interventions: i.e. there are very few cessation interventions that appear to be equally or more effective for low SES smokers. On the other hand, there are important lessons to be drawn from the available evidence, in terms of measures that can be taken to try to improve cessation rates among disadvantaged smokers. There is considerable evidence to suggest that lower success in quitting among disadvantaged smokers can be more than balanced out by ensuring these groups have the best possible access to cessation services. National SSS data from Scotland indicate that in recent years SSS have managed to compensate for lower quit success among low SES smokers by concentrating services in more disadvantaged areas. This is probably also the case for Northern Ireland SSS. This has meant that a higher proportion of smokers in disadvantaged areas have accessed and used cessation support, resulting in a net positive equity effect (i.e. higher population-level quit rates in low SES groups, thus reducing overall inequalities in smoking prevalence). However, it is not clear from this review whether such an equity effect has occurred in England and Wales. Findings from this review suggest that higher service access among low SES smokers may be promoted via primary care.

The review also found that cessation attempts via SSS have declined across the UK in recent years, and that this decline is likely to reduce the potential for cessation support to address inequalities in smoking. This raises important questions about why access and use of cessation services has fallen, and what can be done to improve it.

These patterns and trends suggest that it is important to continue to invest or re-invest in offering cessation support that is specifically targeted and tailored to meet the needs of low SES smokers.

Given the particular barriers these smokers face in attempting to quit tobacco use, reliance on mainstream interventions or unsupported quit attempts (particularly those involving use of new technologies) is likely to further exacerbate existing inequalities in smoking. Without such investment, access and use of cessation support by low SES smokers are likely to decline, which will exacerbate the negative equity impacts of standard cessation interventions. Continued investment in these services must be prioritised if we are to continue making progress in reducing smoking among the most disadvantaged communities, which is a key goal of the current tobacco control strategies of all four UK nations.

8.2 IMPLICATIONS FOR POLICY AND PRACTICE

There are a number of policy implications from our review, including both local and national levels.

- ***Investing in stop smoking services*** Most importantly, our findings demonstrate that, if we are to continue to make progress in reducing smoking among the most disadvantaged communities, continued investment in SSS must be prioritised. Declining use of SSS in recent years suggests a lack of investment in these services is reducing smokers' attempts to quit with appropriate support - particularly smokers from lower SES groups. While the greater use of e-cigarettes may be increasing the success of quit attempts made in the absence of formal support, little is known about their equity impact, and previous patterns of awareness and use indicate that this benefit is likely to be concentrated among more advantaged smokers – thus potentially exacerbating existing inequalities in tobacco use.

- ***Proactive targeting of services to low SES smokers to increase access*** Given the lower efficacy of cessation support for disadvantaged smokers, it is critical that high levels of engagement and service uptake are achieved for this group in order to compensate for their lower quit rates.

- ***Proactive tailoring of services to low SES smokers to increase access and their chances of a successful quit attempt*** Several studies showed promising findings that tailored approaches to reaching low SES smokers (e.g. GP invitation letter, outreach workers, mobile SSS in low SES communities) can increase access to and uptake of SSS. This appears to be more likely to be achieved when national SSS targets include a measurable equity impact, as in Scotland.

- ***Implementation of NHS service approaches that increase engagement of low SES smokers*** Several studies found that comprehensive opt-out CO monitoring and recording in maternity services increased referrals of disadvantaged women to SSS. This points to the possible utility of routine monitoring systems in helping to identify and engage with smokers who would not otherwise access services.

- ***Increasing the effectiveness of cessation support for low SES smokers*** Low SES clients need to be provided with the most effective forms of pharmacotherapy (i.e. varenicline), and approaches that optimise support/service adherence and retention. There is a clear need to invest in developing innovative cessation interventions that are more effective for low SES smokers. The balance of evidence indicates that these groups need tailored service provision in order to achieve the same cessation outcomes as more advantaged smokers. The review

identified several promising interventions and types of support that could be offered through current SSS (e.g. incentives, tailored support matched to literacy levels) as well as through innovative tailored services (such as mobile or outreach services or website support, e.g. StopAdvisor). Involving disadvantaged smokers in the development of such tools seems a particularly promising avenue for improving their effectiveness for this group and strengthening the equity impact of cessation support.

- ***Monitoring and evaluation of SSS targeting and tailoring strategies*** It is important that approaches adopted by SSS to target low SES smokers and to tailor their offering to increase the chances of low SES smokers quitting are properly monitored and evaluated. This will be essential to building a further understanding of how SSS can support disadvantaged smokers to quit and make a pro-equity impact.

- ***Address the broader drivers of socioeconomic inequalities in smoking.*** While outside the scope of this review, we emphasise that efforts to improve the equity impact of cessation support are unlikely to be effective unless accompanied by interventions targeting the 'upstream' drivers of unequal smoking – including measures addressing price and taxation, physical and social environments, industry activity, and socioeconomic inequality itself.

8.3 IMPLICATIONS FOR RESEARCH

The review identified several important gaps in the evidence base on both the impact of SSS on inequalities in smoking, and approaches that are effective in reducing inequalities in smoking.

- ***Improving the equity relevance and robustness of routinely collected SSS data*** The use of a modified NS-SEC classification by the English SSS, coupled with the absence of routinely produced population estimates by occupational status, meant that it was not possible to calculate robust estimates of the population quit attempt rates and population quit success rates for England. Neither were robust equity impact analyses possible using the currently published data on the Northern Ireland and Welsh SSS. In addition, the measures of SES used by the SSS in the four UK nations are not comparable (e.g. the English services use broad occupational categories, while the Scottish and Northern Irish services use a composite index of area deprivation). This makes it difficult to compare national socioeconomic patterns and trends.

- ***Increasing research on the equity impact at the different stages of the cessation pathway (i) low SES access and use*** There was a relative lack of evidence examining how and why low SES smokers engage in the early stages of the cessation pathway. This evidence was often taken from broader evaluations of primary care programmes not specifically designed to evaluate SES differences in smoking status assessment and access to cessation support. As a result, the emphasis was on the quantity of service delivery rather than on its quality.

- ***Increasing research on the equity impact at the different stages of the cessation pathway (ii) quit success*** There is a need for further work exploring how cessation support can be tailored to best meet the needs of low SES smokers. Our review identified some promising examples (e.g. incentives, tailored support matched to literacy levels, the StopAdvisor interactive website) but there is a surprising lack of research in this area. There is also little research on why low SES smokers tend to drop out of cessation support at an earlier stage and how

service providers can help address these barriers to improve outcomes. There is also a need for better data on the differential impact of cessation interventions by SES. Much of the evidence in this review came from studies whose primary aim did not focus on evaluation of equity impacts. While the inclusion of SES data in many studies allows authors to assess this as a secondary objective, such studies are more likely to be affected by important limitations such as a lack of statistical power or use of less comparable indicators, which limits their contribution to the evidence base on reducing inequalities in smoking.

- ***Increasing research on the equity impact at the different stages of the cessation pathway (iii) all stages*** The review identified very few studies that used qualitative approaches to understand how and why engagement with cessation support and subsequent success may differ by SES. Just six of the 43 papers included qualitative data, with three of these using a mixed methods approach. This lack of qualitative evidence limits our understanding of why disadvantaged smokers find it more difficult to quit, and of how services could be improved to strengthen their effectiveness for these groups. Without this information, it is difficult to understand and address the particular barriers faced by lower SES smokers who engage with cessation services but are unable to quit.

- ***Increasing research on reducing inequalities in smoking through SSS provided in secondary care*** The new English Tobacco Plan identifies as a priority providing patients with stop smoking advice and referral to evidence-based support at all relevant points throughout the health system. This includes all NHS hospitals fully implementing NICE PH48 guidance on supporting cessation in secondary care. However, this review did not find a single study set in secondary care that had assessed the equity impact of such support. It is therefore essential that studies and relevant analyses be undertaken, so that the effectiveness of such support in reducing inequalities in smoking in these settings can be maximised. The increased provision of support in secondary care settings is likely to become increasingly important in addressing inequalities in smoking, given the significant and continuing decline in local authority provision of SSS in England (CRUK, 2018).

Further areas of interest for Cancer Research UK

In addition to the areas for further research identified above, Cancer Research UK is interested in better understanding several of the trends and themes identified within this report. These include:

- How community Stop Smoking Services and primary care services can help low SES smokers to quit
- Further evidence on effective methods for Stop Smoking Services to target low SES smokers
- Up-to-date evidence on the role of primary care both in delivering smoking cessation interventions to low SES smokers as well as referring low SES smokers to Stop Smoking Services

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10 APPENDIX

APPENDIX A: SEARCH TERMS APPLIED IN MEDLINE

Search no.	Search terms
Search block: socioeconomic status	
1	exp Socioeconomic Factors/
2	exp Public Assistance/
3	exp Social Welfare/
4	Vulnerable Populations/
5	(socioeconomic or socio economic or socio-economic).ti,ab.
6	SES.ti,ab.
7	(social adj (class$ or group$ or grade$ or context$ or status)).ti,ab.
8	(social$ adj (disadvant$ or exclusion or excluded or depriv$)).ti,ab.
9	(townsend or carstairs or mosaic or health action zone$ or priority group$ or "index of multiple deprivation" or IMD or SIMD or WIMD or NIMDM).ti,ab.
10	demographic$.ti,ab.
11	(inequal$ or equity).ti,ab.
12	(depriv$ or disadvantage$ or poverty or poor).ti,ab.
13	(uninsur$ or insur$).ti,ab.
14	affluen$.ti,ab.
15	(underserved or under served or under-served).ti,ab.
16	(high risk or high-risk or at risk).ti,ab.
17	(marginalised or marginalized).ti,ab.
18	(employ$ or unemploy$).ti,ab.
19	occupation$.ti,ab.
20	(work site or worksite or work-site).ti,ab.
21	(work place or workplace or work-place).ti,ab.
22	(work force or workforce or work-force).ti,ab.
23	income.ti,ab.
24	educat$.ti,ab.
25	minorit$.ti,ab.
26	(area or region or geographic$ or north-south or north south).ti,ab.
27	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26
Search block: smoking cessation	
28	Smoking Cessation/
29	"Tobacco Use Cessation"/

Search no.	Search terms
30	"Tobacco Use Cessation Products"/
31	Smoking/dt, pc, th [Drug Therapy, Prevention & Control, Therapy]
32	smoking cessation.kw.
33	(smoking and cessation).ti,ab.
34	cessation support.ti,ab.
35	((stop$ or quit$ or ceas$ or reduc$ or giv$ up) adj3 (cigarette$ or tobacco or nicotine or smok$)).ti,ab.
36	((cigarette$ or tobacco or nicotine or smok$) adj3 (cessation or abstinen$)).ti,ab.
37	((quit$ or cessation) adj (attempt$ or outcome$ or rate$ or relaps$ or maintain$)).ti,ab.
38	(quitline$ or quit line$ or quit-line$).ti,ab.
39	((smok$ or quit$ or tobacco) adj (helpline$ or help line$ or help-line$)).ti,ab.
40	(smokefree or smoke-free or smoke free).ti,ab.
41	28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40
Search block: general health promotion initiatives	
42	((health or wellbeing or well-being or well being) adj (check$ or assess$)).ti,ab.
43	(NHS choices or NHS 24 or live well or keep well or "add to your life" or one you).ti,ab.
44	(healthy living adj (pharma$ or champion$)).ti,ab.
45	("quality and outcomes framework" or QOF).ti,ab.
46	42 or 43 or 44 or 45
47	41 or 46
48	27 and 47
Search block: geographical location	
49	(UK or "U.K." or United Kingdom or Great Britain or Britain or British).ti,ab.
50	(England or English).ti,ab.
51	(Scotland or Scottish).ti,ab.
52	(Wales or Welsh).ti,ab.
53	(Northern Ireland or NI or "N.I." or Northern Irish).ti,ab.
54	49 or 50 or 51 or 52 or 53
55	48 and 54
56	limit 59 to (abstracts and english language and yr="2012 -Current")

APPENDIX B: LIST OF KEY INFORMANTS CONTACTED FOR GREY LITERATURE SEARCH

Name	Title	Organisation	Location
Jo Locker	Tobacco Control Manager	PHE	England
Qasim Chowdary	Tobacco Control Manager	PHE	England
Scott Crosby	Regional Tobacco Control Policy Manager	Wakefield Council	England
Andy Lloyd	Head of Media & Communications	Fresh NE	England
Andrea Crossfield	Chief Executive Officer	Healthier Futures	England
Kate Barrett	Senior Marketing & Campaigns Manager	Public Health Action (was Smokefree SW)	England
Kate Knight	Director	Public Health Action	England
Celia Gardiner	Tobacco Control Organisation Lead	NHS Health Scotland	Scotland
Garth Reid	Principal Public Health Adviser	NHS Health Scotland	Scotland
Heather Williams	Senior Health Improvement Officer	NHS Health Scotland	Scotland
Richard Lawder	Principal Information Analyst	ISD	Scotland
Shirley Mitchell	Stop Smoking Service Manager	NHS Lanarkshire	Scotland
Kevin Leslie	Young Persons Tobacco Advisor	NHS Grampian	Scotland
Fiona Dunlop	Health Improvement Lead (Tobacco)	NHS Greater Glasgow	Scotland
Kay Samson	Tobacco Co-ordinator	NHS Fife	Scotland
Steven Macey	Research & Policy Officer	ASH Wales	Wales
Sue Bowker	Head of Branch, Tobacco Policy	Welsh Government (WG)	Wales
Keir Lewis	Secondary Care Representative	WG Smoking Cessation Subroup (WGSC)	Wales
Richard Evans	Pharmacy Representative	WGSC	Wales
Denise Puckett	Primary Care Representative	WGSC	Wales
Ashley Gould	Consultant in Public Health	Public Health Wales	Wales
Delyth Jones	Principal Public Health Officer	Betsi Cadwaladr HB	Wales
Mererid Bowley	Consultant in Public Health	Aneurin Bevan HB	Wales
Annie Petherick	Principal Health Promotion Specialist	Public Health Wales	Wales
Gerry McElwee	Head of Cancer Prevention	Cancer Focus NI	Northern Ireland
Gillian Gilmore	Health Intelligence Manager	NI Public Health Agency	Northern Ireland
Alice Taylor	Marketing Executive	CRUK	England
Emily Power	Health Evaluation Manager	CRUK	England
Dan Hunt	Policy Adviser (Public Health)	CRUK	England
Robert Petty	Senior Researcher	CRUK	England

APPENDIX C: QUALITY ASSESSMENT CHECKLIST & COMPARISON WITH CASP INSTRUMENTS

Proposed checklist items	**Associated CASP items[a]**
Core items for both quantitative & qualitative designs	
Did the paper focus primarily on SES experiences of smoking cessation interventions? [Yes/Partial/No]	R1. Did the trial address a clearly focused issue?
	C1. Did the study address a clearly focused issue?
	CC1. Did the study address a clearly focused issue?
	QL1. Was there a clear statement of the aims?
Does the study include data that allow us to look at SES experiences of smoking cessation interventions? [Yes/Mixed/No/Unclear]	CC2. Did the authors use an appropriate method to answer their question
	QL2. Is a qualitative methodology appropriate?
	QL3. Was the research design appropriate to address the aims?
	QL5. Was the data collected in a way that addressed the research issue?
Were the SES indicators used adequate? [Yes/Mixed/No/Unclear]	C3. Was the exposure accurately measured to minimise bias?
	No equivalent CASP item for qualitative studies
Can the study findings in relation to SES experiences of smoking cessation interventions be generalised and, if so, at what level? [National/Local/Mixed/No/Unclear]	R9. Can the results be applied in your context? (or to the local population?)
	C12. Can the results be applied to the local population?
	CC12. Can the results be applied to the local population?
	No equivalent CASP item for qualitative studies
Comment on value of study for our review (cessation experience by SES)	QL10. How valuable is the research?
Items for quantitative designs only	
Did the study design &/or analysis seek to minimise bias in group comparisons (intervention &/or SES) by taking account of potential confounding factors? [Yes/Partial/Mixed/No/Unclear/Not applicable]	R2. Was the assignment of patients to treatments randomised?
	R4. Were patients, health workers and study personnel 'blind' to treatment?
	R5. Were the groups similar at the start of the trial?
	R6. Aside from the experimental intervention, were the groups treated equally?
	C2. Was the cohort recruited in an acceptable way?

Proposed checklist items	Associated CASP items[a]
	CC3. Were the cases recruited in an acceptable way?
	CC4. Were the controls selected in an acceptable way?
	C5. Have the authors identified all important confounding factors?
	C6. Have they taken account of the confounding factors in the design and/or analysis?
	CC6. What confounding factors have the authors accounted for?
	CC7. Have the authors taken account of the potential confounding factors in the design and/or in their analysis?
	CC5. Was the exposure accurately measured to minimise bias?
Were the relevant endpoints[b] accurately measured to minimise bias? [Yes/Mixed/No/Unclear]	C4. Was the outcome accurately measured to minimise bias?
	R10. Were all clinically important outcomes considered?
Were response rates (initial &/or follow-up surveys) sufficient across interventions &/or SES groups to allow for unbiased & valid conclusions to be drawn? [Yes/Mixed/No/Unclear/Not applicable]	R3. Were all of the patients who entered the trial properly accounted for at its conclusion?
	C7. Was the follow up of subjects complete enough?
	C8. Was the follow up of subjects long enough?
Is the study likely to be adequately powered for the SES comparisons? [Yes/Mixed/No/Unclear/Not applicable]	R7. How large was the treatment effect?
	R8. How precise was the estimate of the treatment effect?
	C10. How precise are the results?
	C11. Do you believe the results?
	CC9. How precise are the results?
	CC10. How precise is the estimate of risk?
	CC11. Do you believe the results?
Items for qualitative designs only	
Does the profile of the study participants allow us to look in-depth at SES experiences of cessation interventions?	QL4. Was the recruitment strategy appropriate to the aims of the research?

Proposed checklist items	Associated CASP items[a]
Was the analysis of SES data sufficiently rigorous to shed light on socio-economic experiences of cessation interventions?	QL8. Was the data analysis sufficiently rigorous?
Items excluded as relate more to description, practical issues, contextualisation & interpretation than to quality assessment	CC8. What are the results of this study?
	C9. What are the results of this study?
	QL9. Is there a clear statement of the findings?
	R11. Are the benefits worth the harms and costs?
	C13. Do the results of this study fit with other available evidence?
	CC13. Do the results of this study fit with other available evidence?
	C14. What are the implications of this study for practice?
	QL6. Has the relationship between researcher and participants been adequately considered?
	QL7. Have ethical issues been taken into consideration?

a R: checklist for RCTs; C: checklist for cohort studies; CC: checklist for case-control studies; QL: checklist for qualitative studies

b Relevant endpoints can relate to any point in the cessation pathway, including assessment, access, use & success