



Public Health
Research Consortium

**Tobacco control, inequalities in health and action at the
local level in England.**

FINAL REPORT

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PREFACE

The Government's tobacco control plan for England 'Healthy Lives, Healthy People' identifies tackling smoking as a national public health priority and central to achieving its commitment to 'improve the health of the poorest, fastest'. With public health moving to local authorities, the tobacco control plan charges local authorities with the responsibility for developing and implementing evidence-based comprehensive tobacco control in their areas. To help inform and support tobacco control strategy and policy development at regional and local levels in England, the Department of Health's Policy Research Programme commissioned this review of tobacco control and inequalities in smoking.

This report describes the findings of the study which comprised: a rapid narrative systematic review of the international evidence on action to reduce socio-economic inequalities in smoking, an analysis of adult smoking behaviour and socio-economic status at the regional level in England using surveys and Stop Smoking Service data, and interviews with regional and local tobacco control leads which explored tobacco control policy and practice at these levels and their use of data in decision making. It also sets out recommendations for future research, data collection and dissemination.

There is good evidence on what is effective in reducing adult smoking. However, few studies or reviews have assessed the equity impact of tobacco control interventions. For population level policies there is strong evidence that price (tax) increases reduce socio-economic inequalities in smoking. Mass media campaigns can have negative or neutral equity impacts but recent evidence suggests that certain types of campaigns when tailored to low socio-economic status (SES) smokers could have a positive equity impact. Smokefree legislation increases the protection of low SES groups but its equity impact on smoking is more equivocal. At the individual level, combined behavioural and pharmacological cessation support can reduce inequalities if effectively targeted at low SES smokers. Other types of cessation support have either no or a negative equity impact or lack evidence. There is a lack of evidence on the equity impact of many regional and local level tobacco control activities including social marketing campaigns, tackling illicit tobacco, smokefree homes interventions and cessation services providing incentives.

Smoking prevalence and consumption in England are highly related to SES. Low SES groups have higher smoking rates and lower quitting rates. Smoking rates are highest in Northern regions, where levels of disadvantage are higher. Overall, smoking rates declined between 2001 and 2008, but there were regional and SES variations. The decline appeared to more the result of an increase in never smokers rather than an increase in quitters. No clear trends in smoking rate inequalities over this period were revealed. There is some evidence that since 2008, quitting and quit attempts have declined overall.

Regional and local leads reported a range of ways in which they addressed inequalities in smoking, though these varied in breadth, scope and extent. Reviews and summaries of the research evidence including guidance, notably those produced by NICE and the Department of Health, were important for informing policy and practice, as were informal ways of sharing good practice. Local data on smoking behaviour and its health social and economic impact were viewed as vital for planning and gaining support for tobacco control. These data ideally should be accessible, reliable, up-to-date and to be disaggregated at local (ward) level. The move to local authorities and GP consortia raises potentially new issues and challenges for local tobacco control and the data and evidence required to support this.

EXECUTIVE SUMMARY

Purpose and Methods

Smoking is the single most important cause of premature death and inequalities in health in the UK. Considerable progress has been made in reducing cigarette smoking among adults in Britain. However, there has been less success in reducing socio-economic inequalities in smoking. British data show that smoking rates remain much higher in the lower socio-economic groups and that this is exacerbated by other dimensions of disadvantage including unemployment [1]. Smokers from lower socio-economic groups also have higher levels of cigarette consumption and are less likely to be successful when trying to quit [2].

Addressing inequalities in smoking has been identified by the current and previous Government as a key national public health priority for England [3, 4]. The Coalition Government's recently launched tobacco control plan for England 'Healthy Lives, Healthy People' [4] identified tackling tobacco use as central to achieving its commitment to 'improve the health of the poorest, fastest'. With the imminent move of public health from the NHS to local authorities in England, the tobacco control plan charges local authorities with the responsibility of developing and implementing evidence-based best practice for comprehensive tobacco control in their local areas.

In April 2010 the Department of Health's Policy Research Programme, through the Public Health Research Consortium (PHRC), funded this study of tobacco control and inequalities in health in England. The purpose is to support the tobacco control strategy and policy development at the regional and local levels in England by providing: a review of the evidence on effective action to reduce socioeconomic inequalities in smoking; an outline of what is known about inequalities and smoking at the regional level; a description of tobacco control policy and practice at the regional and local level in England; and a discussion of the implications for regional and local level tobacco control, and national and regional data collection. The study focuses on adult smoking.

The study has five objectives:

1. To identify and review sources of English, UK and international evidence on the efficacy of interventions to reduce adult smoking amongst socio-economically deprived populations.
2. To critically review the strengths and limitations of the evidence and the implications for action at the regional and local level.
3. To identify sources of data in England (surveys and routine data) on adult smoking amongst different social groups, in particular deprived populations.
4. To provide a review of what is known at the national (England) and local level on patterns and trends in adult smoking in different social groups and to use this review to suggest ways of improving data collection to allow commentary on the impact of tobacco control on smoking and inequalities.
5. To describe how tobacco control policy and practice is developed, managed and monitored at regional and local level (eg. PCT or local authority). This includes: cessation services, compliance with smokefree legislation, compliance with tobacco sales legislation, smuggling, local media campaigns, work on smokefree homes

The study consists of three separate but complementary elements.

1. A rapid narrative review of the international evidence of effectiveness of tobacco control interventions to reduce socio-economic inequalities in smoking (Objectives 1 and 2).
2. A review of surveys and routine data on adult smoking (prevalence, consumption, quitting) and socio-economic status (SES) in England (Objectives 3 and 4).
3. Interviews with tobacco control policy makers at the regional and local levels (Objectives 4 and 5).

Key Findings

1. **Systematic Review of international evidence of effectiveness of tobacco control interventions to reduce socio-economic inequalities in smoking in adults**

- **Scope of the review-** the review systematically assessed the published evidence on the impact of tobacco control interventions on socioeconomic inequalities in adult smoking. It updated and expanded a previous review [9,10]. It included papers on any aspect of tobacco control (population and individual levels), published since January 2006 which had carried out some assessment of the equity impact of the policy or intervention with respect to SES.
- **Strengths and limitations of the review-** this is the first review to be undertaken on inequalities and smoking in the past 5 years. Limited project resources meant that it was not possible to assess the methodological quality of papers. However, data extraction sheets were completed for all papers, with the internal and external validity of each paper assessed by at least two members of the team. All study designs were considered. In order to provide some basis for comparing the methodology of each paper, we devised a typology of study designs.
- **Strengths and limitations of the available evidence-** very few studies and reviews have considered the equity impact of tobacco control interventions. Only 90 papers, 9 reviews and 81 primary studies, met the inclusion criteria. There was little review-level evidence other than for mass media campaigns. The majority of primary studies focused on individual cessation support rather than population level interventions. Many studies had limited follow-up periods, were pilot or feasibility studies, used a variety of measures of SES and were mostly conducted in the United States, making it difficult to assess the long term equity impact, and their replicability and generalisability.
- **Assessing the evidence-**the limited nature and extent of the evidence base considerably constrains what conclusions can be drawn about which types of tobacco control interventions are likely to reduce inequalities in smoking. Interventions were categorised into several groups which reflect the strength, consistency, adequacy (ie number of studies/reviews) and direction of the evidence on impact.
- **Population level interventions-**

- ***Price:*** the clearest and most consistent evidence of a positive impact on reducing smoking inequalities relates to (increases in) the cost of purchasing cigarettes.
- ***Mass media:*** the category with next strongest evidence included mass media campaigns and smokefree legislation, though each had their qualifications. There was review level evidence that mass media campaigns can have a negative or neutral equity effect. However, more recent studies and reviews which have explored message content and approach suggest that certain types of campaigns which are tailored to low SES smokers could have a positive equity effect.
- ***Smokefree legislation:*** there is clear evidence that comprehensive smokefree legislation removes inequalities in protection from secondhand smoke which exist in low SES groups when voluntary or partial policies are adopted. The evidence on the equity impact on smoking behaviour is more equivocal. Qualitative studies have found potential equity benefits but quantitative studies have had less consistent findings.
- ***Social marketing, restrictions on marketing, combating smuggling/reducing the blackmarket, smoke free homes interventions, financial or other incentives:*** for these interventions the evidence was judged as either being insufficient or none was found.
- **Individual level cessation support interventions-**
 - ***Behavioural and pharmacological support:*** there is strong evidence that, when effectively targeted at low SES smokers, services providing combined behavioural and pharmacological support can positively impact on smoking inequalities. The evidence is much more limited on what impact, if any, this might have on smoking prevalence at the population level.
 - ***Brief interventions, behavioural or pharmacotherapy only, internet, quitlines, incentives and other types of cessation support:*** the evidence was judged to be insufficient, or, where evidence was available, these types of interventions were judged likely to have no equity impact or a negative impact.
- **Conclusion and recommendations-** There is relatively limited evidence to inform tobacco control policy and interventions that are aimed at reducing socioeconomic inequalities in smoking behaviour. Of particular concern is the lack of evidence for some of the main tobacco control activities being undertaken at regional and local levels in England in recent years, notably social marketing campaigns (including action addressing illicit tobacco), smokefree homes interventions and cessation services providing financial or other incentives for quitting. There is also a lack of evidence on the equity impact of some policies which are being considered at the national level such as further restrictions on marketing (e.g. point of sale, plain packaging). There is a need to strengthen the evidence base for the equity impact of tobacco control interventions. This will require a range of different study designs and methodological approaches from

natural policy experiments to controlled trials, as well as supporting those working in regional and local tobacco control to evaluate and disseminate their work on smoking and inequalities. These developments have the potential to contribute to the national and international evidence base and best practice in England.

2. Regional variations on smoking and quitting by socio-economic status in England.

- **Sources of data on smoking-** the aim was to explore regional and SES patterns and trends in smoking in England. Five national datasets provide smoking and SES data at a regional level: HSE, GHS/GLF/IHS, Smoking Toolkit, Omnibus/Opinions and Stop Smoking Services quarterly four week quit rates. The GHS has the largest sample size and the Omnibus and Toolkit provide the most detailed questions. However, the HSE is the best survey to use to generate sub-national estimates because it is possible to calculate correct confidence intervals, it has a variety of questions on standard topics and a substantial sample size. Other sub-national data on socio-economic status and smoking are available from the Association of Public Health Observatories (APHO) and Tobacco Control regional teams.
- **Regional and SES differences in prevalence:**
 - Cigarette smoking prevalence by SES and region for 2001- 2003 and 2006-2008 was calculated. Three year averages were used to reduce data noise. Using confidence intervals, regional differences from the English average were calculated and significant changes over time were noted. The absolute change in smoking rate was also tabulated.
 - Indicators of SES used were NS-SEC, RG Social class, the index of multiple deprivation, lone parents, car or van availability, housing tenure, income, unemployment and social grade. The nine government office regions were used.
- **Regional and SES differences in prevalence (findings):**
 - Low SES groups had higher smoking rates than high SES groups. Lone parents had particularly high smoking rates. In general, northern regions had higher smoking rates than southern regions. North East low SES had high smoking rates particularly in the early period. London appeared to have significantly low smoking rates and the gap compared to England increased over time. With the exception of East Midlands low SES, overall smoking was declining in all regions and SES groups. Declines tended to be less steep in low SES groups and were mostly not statistically significant.
 - A composite scale of SES was designed by counting the number of indicators of low SES. There was a curvilinear relationship between the number of indicators of low SES and smoking rates. As the number of indicators of low SES grew the smoking rates increased more steeply. Less than 2% possessed the highest number of indicators of low SES but more than 60% of these smoked and these high rates showed negligible

change over time. North-South regional differences could be explained by SES composition and lower smoking rates in London appeared to be the result of a higher proportion of ethnic minorities.

- Higher smoking rates among low SES groups and a slightly greater decline in smoking among high SES groups than low SES groups (except for lone parents) were found in both the GHS and HSE. Individual regional rates and changes over time were not reliable except for lower rates in London.
 - Toolkit data, like the HSE and GHS, show higher smoking rates among low SES and, particularly among low SES, higher rates in northern regions. There was some evidence, from the most recent data, that the decline in smoking may be tailing off, especially among high SES.
 - In summary, regional smoking rates vary by the indicator of SES used and the survey used to measure them. Regional differences could be explained by SES and ethnic variations. Overall smoking rates were higher among low SES and there was less evidence of a decline over time among low SES. The decline in smoking prevalence, particularly among high SES, may be stalling.
- **Regional and SES differences in consumption:**
 - Low SES had higher rates of low, moderate and high smoking than high SES. In HSE 2001-8 data, smoking rates only fell conclusively among high SES heavy and moderate smokers, although there were indications that heavy smoking was also falling among low SES. The 2007-9 Toolkit data suggest that these rates are now falling more swiftly among low SES than high SES. The most recent HSE data showed that London women were less likely to be heavy smokers than northern women. Londoners had particularly high rates of light smoking and the proportion of low SES light smokers in the South East appeared to be growing.
 - **Regional and SES differences in smoking cessation:**
 - Residents of the South East and South West were most likely to be quitters and Londoners were least likely to be quitters. These regional differences could primarily be explained by SES and ethnicity. Quitting was more common amongst those with high SES. The proportion of quitters declined among low SES and remained stable among high SES. It appears that smoking rates had declined because of an increase in the proportion of never smokers rather than an increase in the number of quitters. This may, at least in part, be a reflection of growing immigrant populations.
 - Quit attempts and successful quits in the last year fell between 2007 and 2009. Social grade made no difference to whether a quit attempt was made but did make a difference to its success, with lower success rates among low SES groups. Regional differences were not found.
 - There were differences in Stop Smoking Service quit rates by SES and by region. However, SES differences were fairly universal and were largely unaffected by the region where the smoking cessation programme was

undertaken. SSS quit rates follow the north-south pattern. However, East Midlands had high quit rates and London and WM had low quit rates. Regional and SES effects on SSS quit rates appeared to be independent from one another.

- **Conclusions and recommendations:**

- Regional differences in smoking and quitting were found. Prevalence was highest in the northern regions and there were some indications that higher rates of quitting were found in the southern regions. These differences could largely be explained by SES. High SES was associated with lower smoking rates and higher quit rates. Those with higher SES were more concentrated in southern rather than northern regions. Among high SES smoking prevalence appeared to be falling faster in the southern regions, West Midlands and London.
- Londoners had particularly low smoking rates as a result of high rates of never smoking. These differences have increased over time and are possibly the result, at least in part, of the increasing proportion of ethnic minority inhabitants.
- There appeared to be some regional differences in smoking consumption that could not be explained by SES or ethnicity. Northern women were more likely to be heavy smokers and London women were more likely to be light smokers.
- There are some data concerns. Firstly, only the HSE releases sampling design information which enables accurate calculation of confidence intervals. Secondly, analysis by HSE and GHS produced some marked differences. In the GHS, unlike the HSE, smoking prevalence fell markedly among low SES groups, the North East did not have heightened smoking rates, and low SES from the South East and particularly East Midlands did not show signs of increasing prevalence.
- Some national trends are worthy of more exploration. First, socioeconomic inequalities in smoking prevalence, consumption and cessation persist: smoking in England is concentrated among the multiply deprived. Secondly, heavy smoking declined in the period (2001-2008) examined but different data are needed to determine whether heavy smokers quit or reduced consumption. Thirdly the decline in smoking during this period seems to be more the result in the growth of never smokers than a rise in the proportion of quitters. Finally there may have been a recent (2008-2010) decline in quitting and quit attempts but further investigation is necessary to confirm this trend.
- In future we would recommend that sample design indicators are included with all clustered datasets and that sub-national data are collected with sufficiently large sample sizes to be able to draw robust conclusions. Due to the major changes in the geographic organisation of the NHS and SSS, government office regions may become less appropriate as basic areas for analysis. It is important that surveys keep up to date with the most useful

disaggregations. GPs are a major referral source for SSS. It is therefore important that the new structures of SSS administration and GP consortia are available to national surveys when they come into being.

4. Tackling smoking and inequalities at the regional and local levels in England.

- **Scope of the study:** interviews with regional and local tobacco control leads were undertaken in order to explore current tobacco control policy and practice at these levels, what data are available to inform local and regional decision-making on tobacco control and inequalities, and how useful these data are at regional and local levels.
- **Addressing smoking and health inequalities:** Regional and local leads expressed commitment to addressing inequalities and smoking and had engaged in a range of work on this issue. This varied with respect to both the breadth of tobacco control activities undertaken (from providing only smoking cessation services to co-ordinated, comprehensive tobacco control programmes), and the extent to which they aimed to target disadvantaged groups (from little targeting to these groups being the main focus for interventions). These differences impacted on how evidence was interpreted and used, and how guidance was implemented.
- **Research evidence**
 - Peer-review journal articles were rarely accessed and when they were they tended to be used to inform a particular strategy, campaign or model of service delivery, rather than to appraise the research evidence as a precursor to the development of strategies on inequalities and smoking.
 - Summaries of research evidence (Cochrane, ONS and GHS reports, ASH bulletins, RCP reports) were read, treated as a validated source of information, and used to inform strategy and service development. This evidence was accepted without further reappraisal or reading original research articles, thus distancing service delivery from research evidence.
 - NICE and Department of Health guidance were particularly valued as they were endorsed by key agencies, provided an accessible summary of the evidence and offered advice on how to translate this evidence into practice.
 - While summaries of statistical and epidemiological evidence were widely available, additional information (often qualitative) around the culture and context of smoking and inequalities needed to translate the guidance into service delivery were not cited in the reports/bulletins. This was interpreted as an absence any such research, and so participants commissioned work on their local area, usually focus groups or interviews. Sometimes this work was conducted by universities, so the results might feed into the evidence base through journal articles. More often participants used local insight work with market research companies whose reports were less likely to contribute to the evidence base.

- There was some recognition that more evidence was needed to inform the development of effective initiatives addressing inequalities and smoking ie how to target cessation services, address smoking in the home, and scale of illicit and smuggled tobacco at the local level.
- **Other sources of data and information**
 - Overwhelmingly, participants stated the need for up-to-date evidence relating to health inequalities and smoking prevalence that could be broken down to local areas, particularly ward level. Previously available data, with the exception of SSS statistics, were criticised for being out of date and not having large enough sample sizes to provide meaningful local statistics. These data were viewed as essential for the planning and evaluation of local policy and initiatives. It was hoped that the Integrated Household Survey (IHS) would meet this need, although there were concerns about the delay in reporting and whether it would be able to supply robust local data.
 - Some participants relied on synthetic estimates from Public Health Observatories, or data from GP practices for smoking prevalence. Others had concerns about the reliability and quality of such data, and identified the lack of good regional and local prevalence data as significantly reducing their ability to identify and work with disadvantaged groups.
 - Participants wanted more information that could be used to predict/assess the health and economic impacts of smoking initiatives. This information was vital to convince partners to support services in an increasingly competitive funding environment.
 - Some participants already accessed data held by partner organisations (Fire Service, Police, Trading Standards, HM Customs, schools). This was cited as very positive for future working and determining local and regional priorities and pooling intelligence and resources. Other participants had been denied access to data from other organisations.
- **Reduced budgets for tobacco control**
 - There was a concern that the resources and freedom given to regions and some localities to develop wider tobacco control initiatives would no longer be available, and that future efforts would be directed solely to smoking cessation services. Some believed targets for smoking cessation services to recruit disadvantaged smokers would help address the inequalities agenda.
 - Participants greatly valued networking opportunities (eg alliances, local strategic partnerships, training, conferences), and were concerned that these would not be sustained. Formal and informal networks had provided a vital knowledge and information flow between regions and localities and informed the development of strategies and services.
- **Working with local government**

- There were concerns about the willingness of some local authorities to prioritise tobacco control eg if prevalence was low masking inequalities or if this policy area was not seen as a vote winner.
- Other concerns included whether local authorities would understand that tobacco control comprises more than smoking cessation services.
- While many areas were working successfully with local government through alliances and partnerships, some had not developed relationships. There was a concern that this would lead to an inequitable provision of wider tobacco control between localities, so undermining the health inequalities agenda.

- **Conclusions and recommendations:**

- To be effective, people working at the regional and local levels on tobacco control aimed at addressing inequalities and smoking require reliable and up-to-date sources of data and research evidence. They also need clear indications as to 'what works' to reduce inequalities, and how to interpret and translate any resulting guidance into practice in their local area. Guidance on how to evaluate and demonstrate the effectiveness of their work is also required to build the evidence base and to assess the health and economic impacts of interventions.
- Previously their work has been supported in a number of key ways: (i) using some primary research evidence, summary reports and reviews of research and the provision of guidance at national level; (ii) regional and local funding of tobacco control work to enable sustained programmes; and (iii) the motivation and energy of people working in tobacco control and collaborative and inter-agency working. However, the lack of recurrent, robust and timely local smoking prevalence data linked to local social and economic disadvantage has made it harder for participants to demonstrate that their work has impacted on inequalities in their areas.
- Efforts have also been hampered by the lack of evidence on the effectiveness of particular strategies and interventions designed to reduce smoking inequalities. Thus many tobacco control leads have had to 'improvise' and put in place initiatives unsupported by the current evidence base.
- The Integrated Household Survey with its increased sample size, may meet many of the local data needs, though there will be challenges in providing rapid up-to-date information that can be disaggregated down to the local (ward) level. Presently the guidance states that there will be adequate data to look at unitary areas within the regions (in addition to exploring data at regional level). Although useful, this does not tie in with the new Tobacco Control Plan for England, which has a strong focus on identifying needs and providing services at the local authority level, which the IHS will not be able to directly inform. Local data will probably be an even greater priority in the new structures, especially given the increased competition for funds.

5. Cross-cutting Conclusions and recommendations

- The systematic review found that achieving long term quits is relatively more difficult among low SES smokers and the statistical section found that there is little evidence that tobacco control (or any other factor) in England in recent years succeeded in visibly increasing low SES (or even high SES) quit rates. (There did however appear to be an increase in never smokers (among high SES) but the extent to which tobacco control is responsible for this is not determinable from the surveys).
- The systematic review found a lack of evidence on the equity impact of many regional and local level tobacco control activities including social marketing campaigns, tackling illicit tobacco, smokefree homes interventions and providing incentives for cessation. Many interviewees were aware of this lack of evidence. For some it meant that they had not developed interventions on some of these issues, such as smokefree homes.
- Interviewees found the shorter time lag of the availability of STS helpful compared to government surveys. The statistical section found different trends appearing in the more recent STS data which could not as yet be confirmed by the government surveys.
- The statistical section found that very little data was available from national surveys below regional level and the interviewees were concerned that regional results masked pockets of deprivation. They were looking forward to more local level data being available from the IHS but ideally they would like data available at ward level.
- The survey of available data suggested that national surveys need to be analysed by statisticians due to their complex design. The interviewees discussed using Public Health Observatory experts to help them.
- QOF data was mentioned as a source of information by interviewees. This was not included in the survey of available data because it is not an individual level database (see <http://www.qof.ic.nhs.uk/faqs/index.asp#qof23>). It does not itself include data on inequalities – the demographics of the practices' local areas can be linked externally.

1. INTRODUCTION

1.1 Background

Smoking is the single most important cause of premature death and inequalities in health in the UK. Considerable progress has been made in reducing cigarette smoking among adults in Britain, from 27% in 2000 to 21% in 2008 [1]. However, there has been less success in reducing socio-economic inequalities in smoking. Between 2000 and 2008 smoking in non-manual groups in England declined by nearly a third from 23% to 16%. However, among manual groups smoking declined by only just over a tenth from 31% to 27% [1]. British data show that smoking rates remain much higher in the lower socio-economic groups and that this is exacerbated by other dimensions of disadvantage including unemployment [1]. Smokers from lower socio-economic groups also have higher levels of cigarette consumption and are less likely to be successful when trying to quit [2].

In February 2010 the previous Labour Government launched its ten year tobacco control strategy for England 'A Smokefree Future' [3]. This identified addressing inequalities in smoking as a key priority. It aspired over the next ten years to reduce adult smoking prevalence to 10% or less and to halve smoking rates among both routine and manual workers and in the most disadvantaged areas. This strategy was superseded in March 2011 by the Coalition Government's tobacco control plan for England 'Healthy Lives, Healthy People' [4]. This plan also highlighted that smoking was the single biggest cause of inequalities in deaths, and therefore that tackling tobacco use is central to achieving the Governments' commitment to 'improve the health of the poorest, fastest'. It set a national 'ambition' of reducing adult smoking prevalence in England to 18.5% or less by the end of 2015. Following the Government's previously announced decision to move public health from the NHS to local authorities, the tobacco control plan charges local authorities with the responsibility of developing and implementing evidence-based best practice for comprehensive tobacco control in their local areas.

In April 2010 the Department of Health's Policy Research Programme, through the Public Health Research Consortium (PHRC), funded this study which reviews tobacco control and inequalities in health in England. The intended purpose of this report is to support the tobacco control strategy and policy development in England by providing: a rapid narrative review of the evidence on effective action; an outline of what is known about inequalities and smoking at the regional level; a description of tobacco control policy and practice at the regional and local level in England; and a discussion of the implications for regional and local level tobacco control, and national and regional data collection.

1.2 Aims

The overall aim of this study is to produce a report which critically reviews data sources and research evidence that could inform regional and local action in England on tobacco control and reducing inequalities in health. More specifically it aims to:

1. Explore what data are available to inform local and regional decision-making on tobacco control and inequalities and to critically assess how useful these data are at regional and local level, taking into account recent developments.

2. Produce an overview of current sources of literature that can inform regional and local action on tobacco control and inequalities and to critically assess evidence from this literature and its applicability to regional and local action.

The report focuses on adult smoking. A separate review on smoking among young people in England was undertaken in 2009 by the PHRC for the Department of Health [5].

1.3 Objectives

The report has five objectives.

1. To identify and review sources of English, UK and international evidence on the efficacy of interventions to reduce adult smoking amongst socio-economically deprived populations.
2. To critically review the strengths and limitations of the evidence and the implications for action at the regional and local level.
3. To identify sources of data in England (surveys and routine data) on adult smoking amongst different social groups, in particular deprived populations.
4. To provide a review of what is known at the national (England) and local level on patterns and trends in adult smoking in different social groups and to use this review to suggest ways of improving data collection to allow commentary on the impact of tobacco control on smoking and inequalities.
5. To describe how tobacco control policy and practice is developed, managed and monitored at regional and local level (eg. PCT or local authority). This includes:
 - a. Cessation services
 - b. Compliance with smokefree legislation
 - c. Compliance with tobacco sales legislation
 - d. Smuggling
 - e. Local media campaigns
 - f. Work on smokefree homes

1.4 Structure of the report

The project consisted of three separate but complementary elements.

1. A rapid review of the evidence of effectiveness of tobacco control interventions to reduce socio-economic inequalities in smoking (Objectives 1 and 2). This was undertaken by David Clifford, Amanda Amos, Steve Platt and Sarah Hill.
2. A review of surveys and routine data on adult smoking and socio-economic status in England (Objectives 3 and 4). This was undertaken by Rosemary Hiscock and Linda Bauld.
3. Interviews with tobacco control policy makers at the regional and local level (Objectives 4 and 5). This was undertaken by Jude Robinson and Louise Lavery.

As these three elements addressed different objectives using different study designs, they are each presented in a different section of the report. The main findings and conclusions

from each of these are provided at the end of each section, with the overall findings and conclusions summarised in the Executive Summary.

1.5 Resources and contributions

The project started in April 2010 and was completed in March 2011. Resources were provided to fund a full-time research assistant for 6 months (David Clifford), a part-time research fellow for 5 months (Rosemary Hiscock), additional expert input on smoking patterns and trends (Jenny Fidler) and help with undertaking the qualitative interviews (Louise Lavery). Amanda Amos had overall responsibility for the project and the other grantholders (Linda Bauld, Sarah Hill and Steve Platt) contributed to different elements of the project (see 1.4) and the final project report.

2. SYSTEMATIC REVIEW OF THE EVIDENCE ON THE EFFECTIVENESS OF TOBACCO CONTROL INTERVENTIONS IN REDUCING INEQUALITIES IN SMOKING

2.1 Introduction

There is good evidence on what is effective in reducing adult smoking. A review of the international evidence by the World Bank in 2003 identified six cost-effective policies which they concluded should be prioritised in comprehensive tobacco control programmes [6]. These are:

- price increases through higher taxes on cigarettes and other tobacco products including measures to combat smuggling
- comprehensive smokefree public and work places
- better consumer information including mass media campaigns
- comprehensive bans on the advertising and promotion of all tobacco products, logos and brand names
- large, direct health warnings on cigarette packs and other tobacco products
- treatment to help dependent smokers stop, including increased access to medications.

These priorities have been endorsed by WHO [7] and form the basis of the Framework Convention on Tobacco Control (FCTC), the first international public health treaty [8]. However, few reviews have assessed the equity impact of these and other tobacco control policies and interventions.

This systematic review addressed the first and second project objectives:

1. To identify and review sources of English, UK and international evidence on the efficacy of interventions to reduce adult smoking amongst socio-economically deprived populations.
2. To critically review the strengths and limitations of the evidence and the implications for action at the regional and local level.

Given the limited project resources and short timescale the original intention had been not to undertake a new comprehensive systematic review but rather to summarise and update recent national and international systematic reviews on this topic. This was to include reviews which had looked at interventions aimed at reducing socio-economic inequalities in smoking and reviews of different types of tobacco control interventions/action at the population and individual level which have investigated their effectiveness by socio-economic group. However, few of the systematic reviews obtained from the Cochrane and Dare databases and the NICE website considered the equity impact of tobacco control interventions. Consequently a review of primary studies was undertaken.

2.2 Methods

2.2.1 Search strategy

The search methodology was based on a systematic review of the equity impact of tobacco control interventions undertaken by the Centre for Reviews and Dissemination (CRD) at York University [9,10]. Their methodology was modified in two ways. First, interventions focussed on smoking prevention, i.e. targeted at young people aged under 18 years of age, were excluded. Second, the range of tobacco control interventions was broadened to include smoking cessation support, smokefree policies in the home, mass media campaigns and community programmes.

As the CRD search was undertaken in January 2006 all searches for this review spanned dates from January 2006 until September 2010, covering 12 literature databases (BIOSIS, CINAHL Plus, Cochrane Library, EconLit, EMBASE, Dare Database (including Health Technology Assessment Database and NHS Economic Evaluation Database), ISI Technology and Science Proceedings, Medline, Psycinfo, Science Citation Index, and the Social Science Citation Index. A second search was undertaken for articles with a focus on smoking cessation, building upon a recent unpublished review undertaken by two members of the project team (Hiscock and Bauld) which served as a base for the cessation section of this review. This literature search was supplemented by hand-searching of four journals (Addiction, Nicotine and Tobacco Research, Social Science and Medicine and Tobacco Control) from 2009 until November 30th 2010 as well as accepted articles published on the journals' websites. Details of the search strategy terms are set out in Appendix A.

The CRD review focused on population-level interventions and as such did not review literature on smoking cessation interventions targeted at the individual. Therefore these sections of our review could not build on the CRD's review of literature before 2006. However, it was considered unnecessary to extend the search frame of the current review to address this gap because other reviews have already covered this ground [11-14].

2.2.2 Study selection process

Articles retrieved by the searches were screened by title and then abstract to identify those which were relevant to the research question. Abstracts were reviewed independently by two members of the team to ensure that all relevant papers were included. Full articles were then assessed according to the inclusion/exclusion criteria. One unpublished report was requested and received from the authors after the search found a relevant abstract with no subsequent published report [15].

2.2.2.1 Inclusion criteria

The initial exploration of published systematic reviews suggested that there were few experimental studies that had examined the equity impact of tobacco control interventions. Therefore it was decided that no study designs would be ruled out a priori. This review focused on the impact of tobacco control interventions on adult smokers; only studies in which participants were predominantly 18 years of age and older were included.

In order to be included an article must have been written in English, assessed the impact of a tobacco control intervention, and presented results which address differences between high and low socio-economic status (SES) (categorised as universal) or a focus on a low SES population (categorised as targeted). In order to avoid assigning additional weight to any one paper, articles were excluded if their findings had been used in either a newer article from the same intervention or one of the reviews included in this study.

Having conducted an initial exploration of the literature it emerged that a number of papers were not relevant to the current tobacco control context in England, as they reported findings relating to countries at an earlier stage of the tobacco epidemic [16]. Consequently the review was limited to articles relating to countries at the same late stage of the tobacco epidemic as England. These were mostly from the US, Canada, Australia and Western Europe.

For the purposes of this review the following indicators of SES were included: income, education, occupational social class, area-level socio-economic deprivation, housing tenure and subjective social status. Race/ethnicity alone was not considered to be an appropriate indicator of socio-economic status as the smoking patterns associated with race/ethnicity differ from one country to another, and are therefore not necessarily relevant to English tobacco control policy.

It was not possible within the resources and time available for the review to include grey literature ie reports and papers produced by national and local agencies and organisations. However, some of the review articles (eg those looking at British smoking cessation services) did include such material. Where appropriate these are referred to in this review and are included in the reference list, but no attempt was made to obtain copies of this material and they are not included in the data extraction summaries in Appendix B.

2.2.3 Data extraction

One member of the review team was responsible for data extraction, and their findings were checked by at least one other team member. Disagreements were resolved through discussion. Each publication was summarised using a standard single A4 proforma (see Appendix C).

Although no formal evaluation of the methodological quality of each study was undertaken, the internal and external validity of each study was assessed and taken in to consideration when discussing the impact of each intervention. In order to provide a simple basis for comparing the methodology of each article we devised a typology of study designs (Table 1).

Table 1 Typology of study designs.

Code	Study design and examples
0.0	<i>Reviews</i>
0.1	Narrative review
0.2	Systematic review
1.0	<i>Population-based observational</i>
1.1	Cross-sectional (e.g. national or local population)
1.2	Repeat cross-sectional
1.3	Cohort longitudinal (e.g. use of quitting aids or services)
1.4	Econometric analyses, based on cross-sectional data
2.0	<i>Intervention-based observational</i>
2.1	Single intervention e.g. quit rates among users, or response rates among those exposed to a media campaign

2.2	Single intervention with internal comparison, e.g. quit rates by adherence
2.3	Comparison between different types of intervention, e.g. between groups and one-to-one courses or advert types or media campaigns
3.0	<i>Intervention-based experimental</i>
3.1	Randomised control trial, e.g. NRT v placebo
3.2	Non-randomised, e.g. quasi-experimental, with non-randomised allocation
4.0	<i>Qualitative</i>
4.1	Cross-sectional
4.2	Repeat cross-sectional
4.3	Panel longitudinal

2.2.4 Data synthesis

Given the variations in study research designs, intervention types and outcome measures it was decided that the results would be presented in the form of a narrative synthesis; a meta-analysis of the results was considered inappropriate and not attempted. Results are presented by intervention type (Table 2); evidence from reviews is presented, followed by evidence from primary papers. The main strengths and weaknesses of each reviewed paper are discussed in turn.

2.3 Findings

2.3.1 Introduction

10345 articles were found during the literature searches, of which 4162 were duplicates and 91 were not written in English (Figure 1). A further 5716 were excluded as they were not relevant to the research question and 1 could not be found. Of 374 full articles reviewed, 272 were excluded because they did not discuss socio-economic variations in outcomes, eight were excluded because the research had taken place in a country at an earlier stage of the tobacco epidemic, and five more were excluded as their equity findings had been presented in one of the systematic reviews also included in this report. A total of 93 articles was included in our review. All the included articles were peer reviewed publications apart from a small number of reports, mostly on English cessation services, which were included in review articles.

The findings of these articles are presented by intervention type. The number of reviews and articles by type of intervention are summarised in Table 2. Reviews and articles could appear under more than one heading so do not add up to 90. First, population level interventions which aim to change social norms, smoking behaviour and/or access to tobacco are reviewed. These include mass media campaigns; smokefree policies in public places, workplaces and the home; price; and multi-faceted community programmes. Second, interventions aimed at providing cessation support to individual smokers are reviewed. These include face-to-face support (individual and/or group support) and support offered remotely through quitlines, the internet and other means. For greater

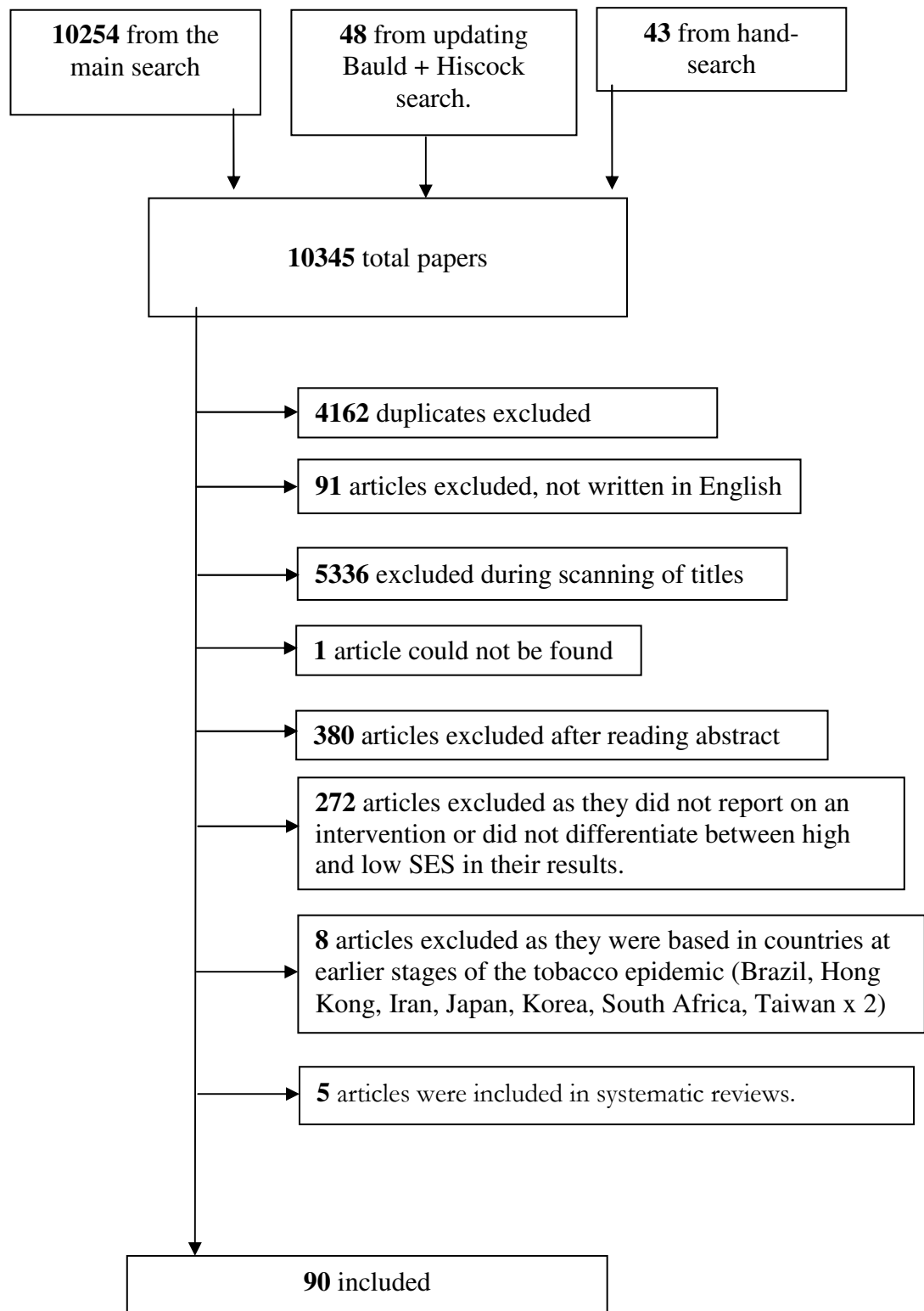
clarity, cessation support has been separated according to type of support given: behavioural and pharmacological, behavioural only, pharmacological only and brief interventions. Each section of the review first considers findings from reviews and then from primary studies. Within each of these sub-sections, evidence is first presented from studies which assessed the impact across SES groups, followed by studies which only included or targeted low SES groups. Where outcome measures include smoking status it is indicated whether these are self-reports or validated (eg by carbon monoxide or cotinine), as self-reports tend to underestimate smoking status, and this bias may be greater in participants followed up in cessation interventions [17].

Summary tables of the articles, grouped by intervention type, can be found in Appendix B, while the data extraction tables for each article are included in Appendix C.

Table 2 Summary of number of review and primary papers included by intervention type.

	Reviews	Primary papers	Total
Mass media campaigns	3	12	15
Smokefree policies- public places, workplaces and homes	1	16	17
Price	2	8	10
Community programmes (multi-faceted)	1	2	3
Cessation support:	4	47	51
<i>Behavioural and pharmacotherapy</i>	2	20	22
<i>Behavioural only</i>	0	7	7
<i>Pharmacotherapy only</i>	0	4	4
<i>Brief interventions</i>	1	3	4
<i>Quitlines</i>	0	7	7
<i>Internet</i>	1	3	4
<i>Other</i>	0	3	3
All	9	84	93

Figure 1 Study selection flowchart



2.3.3 Impact of population level interventions on inequalities and smoking

2.3.2.1 Mass media campaigns

Mass media interventions in tobacco control encompass a range of different types of media, sources and messages. These include paid advertising, earned media e.g. through advocacy, press releases and events such as No Smoking Day, and direct marketing through television, radio, newspapers, magazines, cinema, billboards, posters, leaflets, internet and other digital media (e.g. texts, viral marketing). Mass media campaigns aim to impact directly on smoking behaviour (e.g. increasing quit attempts) and/or changing social norms relating to smoking (e.g. to support policy action, reduce the desirability and acceptability of smoking).

Increasingly, mass media campaigns form part of broader tobacco control campaigns which are based on social marketing principles and often involve community mobilisation and other activities.

Fifteen articles discussed the effectiveness of mass media interventions by socio-economic status [18-32]. Three of these papers were systematic reviews [22, 29, 31]. The twelve primary research papers covered interventions using multiple media formats, television campaigns, the internet and earned media. Articles were only included if they reported on the impact of the mass media element in terms of reach and/or impact at the population level. Articles which focussed only the efficacy of the type of cessation support (and not reach) e.g. quitlines, are reviewed in the cessation sections.

Reviews

The Cochrane review on mass media interventions [22] included only studies with a control group (i.e. community, region or state) and/or interrupted time series. Interventions involving competitions and incentives or quit and win contests were excluded because they focus on uptake rather than cessation or because they were a subject of a separate review. A total of 11 media campaigns was included. All formed part of wider tobacco control campaigns, but were designed so that some separate assessment of the effect of the mass media element could be made. However, it was often difficult to measure the independent contribution that could be attributed to the mass media element of the programme. The review concluded that comprehensive tobacco control programmes that include mass media campaigns can be effective in reducing smoking prevalence. The review gave a relatively brief account of the interaction between media campaigns and low socio-economic groups, as only two of the included studies considered the intervention's equity impact. The California Tobacco Control Programme [33] reported that, among females, the greatest decline had been among those with the lowest education, while among males the greatest decline had been among college graduates. The Massachusetts Tobacco Control Programme [34] described a greater decline among the middle education group compared to the college educated. The review concluded that there was no consistent relationship between campaign effectiveness and education level.

The second systematic review focused specifically on the impact of mass media campaigns on disadvantaged groups [29]. It had much broader inclusion criteria than the Cochrane review (all types of quantitative studies and mass media campaigns including those involving competitions), but only based in the US and similar countries. A total of 40 articles was included. Twenty-nine articles (covering 18 interventions) focused on

whole population (i.e. non-targeted) campaigns which reported on impact by socio-economic status within the context of broader results. Twenty-one articles (13 interventions) covered interventions which specifically targeted low SES and/or ethnic minorities. Interventions were assessed in terms of impact on reach, motivation to quit and quit rates.

This review found that half (9) of the non-targeted interventions had a greater effect on higher socio-economic groups and a third (6) had no differential impact. Three campaigns reported a greater impact among lower socio-economic groups. However, it would probably be unsafe to conclude that these three media campaigns had a real equity impact in terms of smoking cessation. One measured quit-line calls following a USA media campaign involving three advertisements but did not follow callers to assess whether the higher rate of calls among low educated smokers was translated into a higher quit rate [35]. The second study [36] found that smoking rates in lower educated women had declined more in USA states whose tobacco control programmes had a significant media component, but this might have been due to some other non-media element of the state programmes (failure to rule out confounders). The third study reported on a media campaign that was included within a community intervention targeting low SES women in a community in New England [37], making it difficult to separate the impact of the media campaign from the other aspects of the intervention. The community programme included several components (e.g. telephone support, events, workplace interventions, cessation groups) with paid media forming only a small part.

Their review of 13 targeted interventions [29] identified eight USA studies which produced mixed or inconclusive results due to problems with the control intervention, difficulties in separating out the effect of the media in multifaceted interventions, small sample sizes or a lack of a dose-response relationship. Three of these campaigns were targeted at low SES African American communities, four at low SES Hispanic communities and one at a mixed race low income community. One of these studies found that there were greater declines in smoking prevalence in low SES African American communities exposed to a media campaign (billboards, earned media and leaflets) in combination with a community mobilisation campaign (cessation classes, door-to-door, gospel festival) than communities that only received the media campaign [38]. However, it was not possible to assess the unique contribution of the media campaign. The other five studies provided clear evidence that the mass media campaigns had not been effective in changing smoking behaviour among smokers of low SES, as measured by low education, income and occupational class. The review concluded that at present there are no media strategies that are clearly effective in increasing sustained smoking cessation in low SES populations.

The third review was the Cochrane review on quit and win contests [31]. The review only included randomised controlled trials or controlled before and after studies. Five studies met the inclusion criteria. Three showed significantly higher quit rates in the participant groups; however, the number of participants was small and therefore would not have affected community prevalence rates. No overall conclusions were drawn in relation to SES. Two of the studies, both in the USA, found that participants were more likely to be of low SES [39] or lower education [40] than the control groups. However, the study which was identified as having the most promising and valid results, carried out in Kentucky, found that at one year follow-up, those on higher incomes (income over \$20,000) were as likely to have quit as those on lower incomes [40]. The review also

considered separately key excluded quit and win contests as these covered major national and international contests which precluded having control groups. These competitions were judged to be more promising since they attracted larger numbers of participants. However, the review found that participants tended to be better educated. The situation in relation to SES was less consistent; one Canadian and one UK study found a preponderance of high SES participants, while one USA and one Swedish study found a preponderance of manual workers.

Primary studies

Twelve primary research papers reported on the impact of mass media by socio-economic status. Six interventions were run in multiple media formats (e.g. television, radio, posters) [20, 21, 23, 24, 27, 41], three were television campaigns [24, 28, 32], two papers reported on internet advertising campaigns [18, 26] and one used mostly earned media coverage [32]. Only one intervention had a direct equity focus, being targeted at young adult smokers with no University education in British Columbia [24], while two others referred to equity in their research question [24, 28].

Multiple media formats

The six interventions which used multiple media channels had mixed effects on inequalities in smoking and use of smoking cessation support services.

The first intervention studied the awareness of a media campaign to highlight a one month giveaway (free) nicotine patch programme in New York City, and potential interest in using the programme [19]. The campaign used paid and unpaid television, radio and print advertisements featuring testimonials from dying and sick smokers and graphic images of the physical effects of smoking. The highest income and education groups had significantly lower awareness of the programme than the other groups, with no significant differences between the other income and education groups. The two lowest income and education groups were significantly more likely to report that they would have called the service had they heard about it.

The second intervention was a California-based intervention which used television, radio and print advertisements in English, Spanish, Mandarin, Cantonese, Korean and Vietnamese to promote the use of the state's quitline [24]. The paper examined the use of the quitline by young smokers (aged 18-24) from 1992 to 2006. They evaluated quitline reach among young low SES groups by comparing the proportion of smokers calling the quitline against prevalence data for this age group, using income and education as well as mapping caller zip (post) codes against median neighbourhood income levels to approximate the socio-economic status of callers. They found that, after initially being under-represented, smokers with lower education became over-represented among callers. Smokers with incomes below \$40,000 had always been over-represented among quitline callers, as had young smokers from low income neighbourhoods.

The third study used a quasi-experimental design to evaluate the impact of a media campaign for the Colorado Quitline targeting Spanish-speaking smokers [21]. Advertisements in Spanish were aired on Spanish-language television channels, radio and at cinemas in majority-Latino neighbourhoods. The advertisements delivered 'positive, supportive and encouraging' messages and modelling of quitting through actors portraying key family members (relating to the important cultural value of familismo). Quitline calls among Latino smokers increased by 57.6% over the three month campaign

period, with Latino callers significantly more likely to be younger, uninsured and of lower education status. Callers during the campaign were also significantly more likely to report remaining abstinent at 6-month follow up (18.8% post-intervention, 9.6% pre-intervention, $p=0.04$).

The fourth study, also in the USA, looked at the impact of extending the eligibility for free nicotine replacement therapy and counselling calls among Washington quitline callers from young low-income or uninsured callers to all 18-29 year olds [27]. This change in eligibility criteria was promoted through print media (paid and earned), radio advertisements and community promotions, along with a series of poster advertisements to promote the change. There was an increase in calls from most age groups, but particularly young, higher-income (over \$20,000 household income) callers which was attributed to eligibility for free NRT expanding to cover those with private medical insurance. The seven day quit rates also increased more dramatically among the higher income callers, probably as a result of their new eligibility for free NRT.

The fifth study assessed the impact of a Quit and Win contest in the Netherlands which was promoted through a radio, print media and poster campaign [20]. Members of the control group of smokers, which had been recruited by email, were significantly more likely to have less than a high school education than the sample of contest participants. Given this bias, it was not possible to draw conclusions about the possible equity impact. Having a university education was a significant predictor of abstinence at one-month.

The sixth intervention which used a combination of advertisements on television, radio and posters targeted at young, non-University educated in British Columbia [25], found that while prevalence and consumption for the rest of Canada increased during the follow up period, this was not the case in British Columbia. However, this potentially protective effect was only significant among the non-target group.

Television advertisements

The three interventions which used only television advertisements found that the type of messages used in the advertisements had a different impact by socioeconomic status. One cohort study assessed response to different types of advertisements that were aired as part of the Massachusetts Tobacco Control Programme [24]. Advertisements were categorised as either personal testimonials, highly evocative, both, or humorous/factual. Socio-economic status was measured using a composite of education and income, defining low SES as those with neither a university education nor an income over \$50,000, and high SES as meeting both criteria. Quit rates increased with total exposure to the advertisements (as measured by gross rating points), with the most emotionally intense advertisements and those containing personal stories having the most impact. This impact was significantly greater in the mid-SES groups followed by the low SES group. The authors concluded that high exposure to emotionally evocative advertisements that contain personal stories about smoking and quitting could help reduce inequalities in smoking.

The second study looked at the impact of two different advertisements used in the Wisconsin Tobacco Control and Prevention Programme [28]. One advertisement encouraged cessation with the message that, while quitting was difficult, it is possible with help (i.e. the quitline). The other used testimonials from ex-smokers which highlighted the dangers of second-hand smoke. The advertisements were targeted at all

smokers but some were placed in television programmes with high proportions of low SES viewers. While neither advertisement was associated with improved quit attempts or quit success overall, the quitting advertisement was significantly more effective in promoting quit attempts in higher compared to lower educated groups. In contrast the second-hand smoke advertisement had a similar response across all socio-economic groups.

The third study assessed the perceived impact of a range of television advertisements among smokers [32]. Participants were asked about either advertisements that were planned to be aired or had been shown recently, and were asked to rate the advertisements' effectiveness at attracting their attention and making them think about their smoking behaviour, as well as whether the advertisement was believable and made them want to quit smoking. Their results suggested that the advertisements' perceived effectiveness was comparable to the effect of many well-regarded anti-smoking campaigns; 'Why to quit' adverts with both graphic images and testimonials were significantly more effective than the 'How to quit' and anti- tobacco industry advertisements. Advertisements generally had no differential impact by education; the only significant association was between smokers with some or a full college education being less influenced by the anti-industry advertisements than those with less than a high school education. However, this could be influenced by the choice of reference group: the less than high school educated group was the smallest in the study sample, and therefore it is harder to detect a significant association. Perceived effectiveness varied more by education, with higher income being associated with higher effectiveness for both 'Why to quit' adverts. However, it is impossible to assess from this study whether the advertisements subsequently influenced the participants' smoking behaviour.

Internet advertisements

The first internet advertising campaign study assessed the impact of advertisements placed on national and local websites and search engines over a 23 month period to promote a web-based cessation service and a quitline in Minnesota and New Jersey [26]. Internet advertising was much more successful and attracted a relatively higher proportion of men, young and low-educated smokers (i.e. with high school degree or less) compared to traditional advertising such as billboards and television or radio advertisements. Humorous advertisements were particularly effective, and banner advertisements placed on search engines directed significantly more low SES smokers to the cessation support website compared to those actively searching for support. The subsequent level of engagement with the advertised cessation website was significantly lower among those recruited online, but the authors argued that this was such a small difference that it would be clinically insignificant. However, as there was no comparison of the SES profile of participants with the smoking population, it was not possible to assess what impact, if any, this approach might have on inequalities in smoking.

The second internet-based intervention, also in the USA, placed advertisements on Google and Yahoo search engines to attract users who searched for "quit smoking" or "stop smoking" [18]. The study found that higher educated groups were far more likely to enrol in the intervention. Only 6.8% of the participants had no high school degree, 26.1% were high school graduates, whereas 67.1% had either some college education or a college degree.

Earned media

Earned media refers to favorable publicity and media coverage gained through promotional activities other than advertising e.g. through advocacy, press releases, special events. While several of the previous studies included earned media as part of their campaigns, only one study assessed the impact of a campaign that only used earned media alone, the UK's No Smoking Day (NSD) [30]. This study monitored the level of awareness, participation and impact on quitting since its inception in 1986. The event does not use advertising but earned media, with over 1500 thousand news stories included in local print media each year. The authors calculated that the advertising equivalent of this coverage was more than double the event's total budget. The 2004 survey of smokers carried out three months after NSD found that 78% were aware of the campaign and 15% had participated in NSD, with 5% giving up or cutting down for up to a day, 5% for up to three months, and 1.2% reporting that they had quit for 3 months. The level of participation was similar across social groups AB to DE, but no data were presented on the length of participation or level of success by SES.

Summary

Based on evidence from three systematic reviews, there is empirical support for the conclusion that comprehensive tobacco control programmes that include mass media campaigns can reduce smoking prevalence. However, an equity impact has not been clearly demonstrated and no media strategies which successfully encourage smoking cessation in low SES groups have been identified. There is some limited recent evidence that the tone and content of media messages and advertisements may have a differential impact by SES group. Evidence concerning the effectiveness of quit and win contests on increasing quit rates is equivocal; no conclusions can be drawn in relation to equity impact. Primary studies of interventions using a range of media channels do not provide strong or clear evidence of differential impact by SES.

2.3.2.2 Restrictions on smoking in public places and workplaces

The CRD review concluded that there was no compelling evidence that smokefree policies in public places or workplaces had a differential impact by SES. They found some limited evidence that restrictions on smoking in public places and workplaces may have a greater effect among higher occupational classes, but no differential impact by education or income [8, 10]. They did not include any studies that had looked at interventions aimed at increasing restrictions in the home.

One paper reviewed the evidence of the equity impact of tobacco control policies in six European countries, including the impact of smokefree workplace policies [13]. Sixteen papers studied the socio-economic impact of smokefree workplace and public places. Four explored the impact of national comprehensive smoke-free legislation on quit attempts and cessation rates in England or Scotland [42-45]. One paper examined the childhood exposure to secondhand smoke in Scotland following the smokefree legislation [46].

Three papers undertook a qualitative study of the impact of smokefree policies on public places, and smokers in these places, in England and Scotland [47-49]. Two American papers studied the workplace smoking policies among American women [50, 51]. Two papers focused on female bar-staff as a relatively low-income, low education occupational group [52, 53]. One studied the links between workplace smoking restrictions and the proportion of skilled employees [54]. Two studied the impact of workplace smoking bans on differential exposure in the Netherlands [56, 57]. One paper

assessed the relationship between the existence and impact of workplace smoking restrictions in Europe [57]. In addition, one of these 16 papers and another paper focused on smoking restrictions in the home.

Reviews

One paper conducted a review of the evidence of the equity impact of several tobacco control policies, including workplace smoking restrictions, in six western European countries [13]. They found only one European study that had looked at the equity impact, which concluded that when policies were optional these were far more likely to be implemented in workplaces dominated by white collar workers.

Primary studies

National smokefree policies

One international study estimated the equity impact of workplace smoking restrictions, based on the proportion of ex-smokers in 18 European countries [57]. They concluded that there was no association between the implementation of national smokefree legislation and the differential quit rates by SES (measured by education level). However, the study used national data collected in 2004-5, which was before any countries had implemented comprehensive smokefree legislation.

The four papers studying the impact of Scottish and English smokefree legislation comprised a cohort study following the participants in a Scottish trial for 50-75 year old atherosclerosis patients [43], a quasi-experimental study comparing post-legislation outcomes in Scotland with trends in England which had no smokefree legislation at the time [44], a repeat cross-sectional study evaluating the impact of smokefree legislation in England [44] and comparison of parents of Millennium Cohort Study (MCS) children in Scotland to those in England [45]. The first three studies did not find a significant difference in impact by socio-economic status. Fowkes et al [43] found an increase in quit attempts and in successful cessation rates among patients, with many rating the ban as a strong influencer. However, there was no association between quit attempts and area-level deprivation (as measured by the Index of Multiple Deprivation), although participants from more affluent areas were more likely to have a positive perception of the legislation.

The second Scottish study found a dramatic fall in smoking in public places in Scotland post-legislation, but no difference in response to smokefree legislation by SES [45]. There was no significant difference in the rate of quit attempts or NRT usage in Scotland compared to the rest of the UK. Hypothesised negative effects, such as smokers visiting pubs and restaurants less frequently, had not occurred in the study sample, while Scottish non-smokers were more likely to visit these places than their counterparts in the rest of the UK [45].

Hackshaw et al [44] found that the English smokefree legislation inspired a significant rise in quit attempts before and after it was introduced, with one in five successful quitters post-ban saying that they had been influenced by the smokefree legislation. Quit attempts did not vary by occupational class. Intention to quit was not analysed by occupational class.

The fourth paper compared the impact of the Scottish smokefree legislation on parents of children in the Millennium Cohort Study (MCS) with parents in England, effectively a

control group 42]. Parents were interviewed when the cohort child was five years old, which coincided with the implementation of Scotland's smokefree legislation. They found no significant differences in parental smoking between England and Scotland. However, smoking cessation among mothers in England was associated with higher household income and occupational class, and leaving school or giving birth at a later age. There was no such socio-economic variation in Scotland. In addition, lower socioeconomic status was associated with higher rates of maternal smoking initiation and smoking in the home in both countries. However, it is difficult to attribute any of these findings directly to the smokefree policy given the long time periods involved in the project. Over five years passed between the baseline data collection and the post-legislation follow up, so participants may have quit smoking as a result of a number of factors including parenthood itself.

One Scottish study looked at the impact of smokefree interventions on reported smoking restrictions in the home. The study measured childhood exposure to secondhand smoke by salivary cotinine levels before and after the Scottish smokefree legislation. It found that exposure was most reduced among those from the lowest SES groups (as measured by the Family Affluence Scale or socio-economic classification). However, although the absolute gap between the highest and lowest socio-economic groups had decreased, there was a suggestion (not statistically significant) of a possible longer term widening of the relative inequality between the groups [46].

Three qualitative studies explored the impact of the smokefree legislation in England and Scotland. Two studies used a similar longitudinal cohort community study design [47, 48]. They included a diverse range of neighbourhoods and conducted interviews with smokers and ex-smokers to identify how and why the legislation had influenced their smoking behaviour, observed smoking behaviour, and documented changes in outdoor accommodation and facilities for smokers. The study in England [47] compared neighbourhoods in the north and south of the country and found that over half of their respondents reported reduced consumption, and a further fifth had quit, citing the legislation as a prompt. The Scottish study found that more participants in the deprived communities had quit than those in the affluent communities [48]. Both studies found that pubs in the more advantaged localities were more likely to have been smokefree before the legislation, and more likely to provide comfortable outdoor accommodation for smokers. Thus, the bans had impacted more on smoking behaviour in public places in more disadvantaged communities. Both studies concluded that smoking behaviour was highly sensitive to the socio-cultural context, which limited the ability of legislation to exert further influence in public places.

The third qualitative study focused on a deprived neighbourhood in North London, purposefully recruiting 32 Somali, Turkish and White British smokers to represent the main ethnic groups in the neighbourhood [49]. Smoking was closely linked to social behaviour for most of the smokers. Three participants claimed to have quit after the ban, with one directly attributing their cessation to the legislation. Half of the participants claimed to have reduced their cigarette consumption following the ban, either because they felt prompted or their opportunities to smoke had reduced. Half of the respondents stated that they imposed a smoking ban at home, while the other half appeared to smoke more at home in response to the legislation. Several interviewees also reported seeing the smoking ban flouted in public places, and claimed that there were some underground cafes and restaurants where customers were permitted to smoke.

Workplace smoking policies

Two USA studies analysed the association between socio-economic status and being subject to a workplace smoking policy [50, 51]. Both used cross-sectional data from one or two time points. Using national survey data, one study found that the likelihood of having a workplace smoking policy increased with increasing distance from the poverty threshold [50]. However, having a workplace smoking policy was not associated with quit attempts in the previous year for any of the poverty level categories.

The second USA study involved Asian American women living in California, who had therefore been exposed to the state tobacco control programme which had promoted smokefree social norms since 1988 [51]. It found that there were similar rates of smokefree policies in indoor workplaces across educational levels. However, lower educated women reported significantly higher levels of exposure to smoke in the workplace. It also found that there was no association between education and the adoption of home smoking bans. However, those with a high school degree or lower were more likely to report exposure to second-hand smoke in the home and that they had less control over home smoking policies than those with higher levels of education [51].

A study of workplace smoking restrictions in Zurich [54] found that those where fewer than 20% of workers were unskilled were significantly more likely to have a restrictive smoking policy, and to be at a more advanced stage in their policy compared to those with more than 80% unskilled workers. However, this study was based on the estimated smoking prevalence provided by a manager at the company.

Two studies explored the impact of smokefree workplace regulations in the Netherlands. The first found that the lower-educated workers continued to be far more exposed to secondhand smoke than their mid- and highly- educated peers after the introduction of a workplace smoking ban in 2004 [55]. The second found that there were more successful quit attempts among higher educated smokers after the ban than among low educated smokers [56]. The second study also found that the more recent smokefree legislation covering hospitality venues had had no significant impact on prevalence or socio-economic variations in quit rates.

Two studies examined the impact of workplace smoking bans on bartenders, used as a lower occupational group due to their relatively low income and relatively high rate of lower secondary education [52, 53]. The first study was based in Norway, where a public places smoking ban was introduced in 2004. Pre- and post-ban interviews with staff suggested that the prevalence of daily smoking, and average consumption, had decreased slightly since the ban. However, their sample sizes were too small to make a definitive conclusion of the ban's impact on inequality [52]. A study of bartender exposure to second-hand smoke found that bars targeting immigrant populations in California were regularly flouting public smoking laws [53]. The study concluded that enforcement was considered to be a relatively low priority, particularly as known non-compliers regularly attracted relatively more smokers, which suggested that some niche populations were not being protected by the workplace smoking ban.

Summary

The one systematic review did not find any evidence on the differential impact on quitting of smokefree policies in public places or workplaces by SES. Quantitative analyses of

the Scottish and English smokefree legislation did not find a difference in impact by SES. Studies of workplace smoking policies showed that, where they were optional, unskilled workers were more likely to be exposed to secondhand smoke; however, no clear evidence of a differential impact of these policies by SES was provided. Findings from two studies suggested an association between lower SES and exposure to secondhand smoke in the home. One study found that comprehensive smokefree legislation appeared to have more impact on reducing exposure to secondhand smoke among low SES children, but the longer term impact on relative inequalities was not clear.

2.3.2.3 Price increases

Raising the price of tobacco has increasingly been used as a method of encouraging people to quit smoking. The earlier review conducted by the CRD concluded that there was consistent evidence to show that increasing the price of cigarettes was an effective method of reducing smoking prevalence among smokers on low-income and in manual occupations [9, 10]. It also concluded that on balance the econometric evidence showed that it was relatively more effective in these groups. Evidence that increasing price led to greater falls in prevalence among higher educated smokers came from highly specified study populations whose findings may not be transferable to the general population (men in Taiwan, pregnant women in the USA).

Ten studies assessed the impact of cigarette price on smoking inequalities [13, 36, 57, 58-64]. Four studies were based on data from the United States [36, 58-60], one study was from France [63], one from Ireland [62], one from Australia [64], one reviewed all international evidence [65], and two looked at data from several European countries [13, 57].

Most of the articles used econometric models (study design 1.4) which combined repeat cross-sectional or longitudinal survey data with inflation-adjusted prices for a packet of cigarettes. Other approaches included a literature review combined with a cross-national comparison of cigarette prices [13], an expert review panel [65], and a mixed-methods project that included both national repeat cross-sectional data and in-depth interviews to explore the reasons why low-income smokers failed to respond to an increase in tax [63].

Reviews

The first literature review concluded that increases in the price of cigarettes was one of the most promising interventions for narrowing smoking inequalities [13]. However, this was based on only one article from the UK which found that manual workers were more responsive to increases in price than professional workers, although a separate study suggested that this benefit may be partially offset by smokers switching to cheaper brands or hand-rolled tobacco. The second review was conducted by an expert inter-disciplinary panel, which examined the peer-reviewed evidence on the impact of tobacco price increases on tobacco use [65]. They assessed the strength of evidence for a series of statements, including the equity impact of tobacco price increases in high income countries. They concluded that, in high income countries, there was strong evidence that tobacco use among low income populations is more responsive to tax and price increases than tobacco use among high income populations. However, they did not find sufficient evidence to conclude that this was directly caused by price increases.

These conclusions on the efficacy of tobacco taxation have been borne out by the primary research papers found in the present review. Five articles found that lower socio-

economic groups, typically measured by income, were more responsive to higher cigarette prices, i.e. produced reductions in tobacco use through increased cessation and/or decreased consumption.

Primary studies

The Australian study used data from a rolling cross-sectional survey of residents in the five largest cities of Australia [64]. Smoking prevalence, measured by whether respondents currently smoked manufactured cigarettes or had smoked roll your own tobacco in the previous month, was compared with the income level of the household's highest earner. Rising inflation-adjusted cigarette price had the greatest impact on those in the lowest income category (<AU \$18,000), with a price elasticity of -0.32 compared to -0.04 and -0.02 in the mid and higher income groups, respectively.

Two studies from the USA investigated whether tobacco taxation is regressive. Each used data from nationally representative repeat cross-sectional surveys to monitor smoking prevalence, and found an inverse relationship between income and price responsiveness. Colman and Remler [58] investigated the impact of tobacco taxation on low income smokers in particular. Increasing tobacco taxation had a small narrowing effect on socio-economic inequalities in smoking. It was estimated that a \$1 rise in the price of a packet of cigarettes would lead to a 2.3 percentage point (pp) decrease in smoking prevalence in low-income smokers, compared to 1.7pp and 0.8pp in the middle and high income groups, respectively. However, the authors concluded that, as a result of the tax burden borne by the low-income smokers, an increase in tobacco taxation was regressive. On the other hand, the second study found no evidence that increased cigarette prices reduced disparities in smoking prevalence, with some indication of increasing difference in prevalence between the low income group and the rest of the country [66]. They too concluded that tobacco taxation was regressive due to the disproportionate tax burden that falls upon low-income smokers.

A study of the impact of 22 tax increases across 18 American states upon smokers aged 45-59 years found that there was a greater impact on lower SES smokers, whether measured by education or income [59]. They found that a \$1 increase in tax reduced the prevalence of smoking among low-income (<\$35,000) groups by 10%, while reducing smoking among those with higher incomes by only 2% (or by 10% and 3%, respectively, when analysing the impact by education).

A repeat cross-sectional study of low-educated American women found that, between 1992 and 2002, smoking prevalence declined more rapidly among low-education compared to medium and high education women, and that low-education women were more responsive to price increases (and media) [36]. An Irish study found that increased cigarette prices were associated with later initiation among those with an intermediate education, but not those with only a primary education. Taxation was also associated with earlier cessation among those with a primary education, but had no differential impact among those with other levels of education [62].

A study of the impact of tobacco control policies on education related inequalities in eighteen countries in Europe [57] found that price increases had a stronger association with national quit ratios than any other type of tobacco control policy (ie countries with price increases had higher smoking cessation rates). However, they appeared to have had no significant impact on inequalities.

A French study presented data from a national repeat cross-sectional survey between 2000 and 2008, during which time the price of a packet of 10 cigarettes increased from €3.20 to €5.30. Smoking prevalence among executive managers and professionals fell after the cigarette prices had begun to increase, whereas manual groups showed a smaller, later, and temporary decline (prevalence increased again soon after). However, the validity of these findings is weakened by the relatively small sample of the manual group in most of the survey years.

In an attempt to understand the reasons why some disadvantaged smokers fail to respond to an increase in tobacco price, researchers conducted a series of in-depth interviews with 31 smokers in south-east France [63]. Interviewees described themselves as low income, with this subjective social status verified via the neighbourhood income level. Smokers were commonly aware of the nature of their addiction, and its physical and material costs, but continued to smoke as it was perceived to offer a relief from emotional problems or was one of their only remaining sources of enjoyment.

Summary

Review-level evidence, broadly supported by findings from primary studies identified in this review, suggests that, in high income countries, tobacco use in low income groups is more responsive to tax and price increases than tobacco use among high income groups.

2.3.2.4 Multi-faceted community interventions

Community interventions were defined as interventions in a specific geographical area which used a combination of approaches to reduce adult smoking. These included interventions which focused only on smoking and those which focused on changing several health-related behaviours e.g. in a heart disease prevention programme. Community interventions which only focused on increasing uptake of cessation services or support were not included here but are included under the cessation sub-section (2.3). One review and two studies discussed the outcomes of community-based interventions [67-69].

Review

The Cochrane review [69] included only studies with a control or comparison community published before February 2006. A total of 37 studies was included. Overall the review concluded that, while some studies showed some impact on smoking prevalence, the two largest and best conducted studies (USA COMMIT and Australian CART) showed no overall impact on smoking prevalence. The review did not look at the equity impact of the included studies. Several of the community interventions may have taken place in disadvantaged communities but this was not discussed. Only one study, the Community Coalitions to Help Women Quit Smoking Project which was carried out in Vermont and New Hampshire [37], was described as having an impact in relation to SES. At the five year follow up in the intervention counties there was a significantly lower smoking prevalence in women and a significantly greater quit rate in women with lower incomes.

Primary studies

Two programmes included smoking cessation interventions within a broad range of activities designed to improve several health-related behaviours. Both were based in multiply deprived communities in the Netherlands and used a cohort design [67, 68]. Neither intervention showed clear evidence of an impact on smoking-related inequalities.

One study was carried out in deprived neighbourhoods in Eindhoven [68] which were compared to socio-demographically similar control neighbourhoods. Fifty-three intervention activities were planned, of which four targeted smoking. However, 10 activities, including two of those targeting smoking, were cancelled (the smoking ones due to low participation rates) which suggests that at least one of the three study communities had no local access to a smoking cessation intervention. After two years the intervention had no impact on smoking prevalence, with the intervention communities showing a decline from 41% to 40% and controls declining from 41% to 39%. However, after controlling for population movement between intervention and control areas, there was a significant decline in consumption of 1.2 cigarettes per day (cpd) in the intervention neighbourhoods against a 0.1 cpd decline in the control neighbourhoods.

The second study reported on the five year Hartslag Limburg community intervention which aimed to improve several cardiovascular risk factors [67]. This comprised 590 major interventions, nine of which were ‘anti-smoking’ campaigns including billboards, posters and leaflets. The intervention incorporated both a broad population strategy and action targeted specifically at low SES groups. Compared to the control region there was no significant difference in overall smoking prevalence or by educational status.

Summary

There is insufficient evidence to draw conclusions about the impact of community-based smoking cessation interventions on socio-economic inequalities in smoking.

2.3.3 Impact of individual level cessation services and support on smoking inequalities

2.3.3.1 Behavioural and pharmacological interventions

Behavioural and pharmacological interventions combine either individual or group counselling sessions (or both) with some form of pharmacotherapy i.e nicotine replacement therapy, bupropion, varenicline. This is the form of support provided by NHS smoking cessation services. 20 articles assessing the differential impact of behavioural and pharmacological smoking cessation interventions were identified by the literature search [70-89], plus two systematic literature reviews [11, 12].

Reviews

The two systematic reviews both examined the impact of smoking cessation services. The first examined the effectiveness of NHS smoking cessation services, with some comments on disadvantaged populations [11]. In reviewing 14 articles and 6 reports from grey literature they found that the cessation services were effective in both the short and long-term, with group and buddy services generally more effective than one-to-one. Although the services attract more smokers from deprived areas, five articles found that their cessation rates were lower than those of service users from more advantaged areas [100-104]. Two papers found the same pattern among lower occupational groups [104, 105]. One article examining the impact of services in Spearhead areas found that cessation services were having a slight narrowing effect on inequalities in smoking prevalence [106]. The review authors concluded that it was difficult to draw conclusions based on the small amount of equity-focused research, but it appeared that the inequalities in

outcomes were associated with fewer low SES smokers being able to sustain their quit attempt.

The second review examined access to services among deprived communities and included 48 articles, 23 from the UK, examining the impact of a variety of interventions [12]. They found evidence that NHS smoking cessation services [90, 91], services based in pharmacies [92-94], and those using social marketing [95], all had a positive impact on access among low SES groups. Improving service accessibility through drop in systems rather than booked appointments [96] and providing services in the workplace [97] also appeared to increase service use among smokers from low SES groups. One study of proactive recruitment with the offer of NRT increased quit rates and decreased consumption [97] while another, without the offer of free NRT, increased attendance but found no impact on cessation rates [99]. The review's authors commented that it was difficult to draw firm conclusions about the equity impact of these interventions because relatively few articles report on the differential impact of interventions, and as such findings can only be seen as an indicator of the promise of some interventions.

Primary studies

Four papers assessed the impact of NHS cessation services. The first compared the outcomes for pharmacy-led and group cessation support service users who set a quit date in March-May 2007 [70]. Group support included 7 weeks behavioural support with a choice of pharmacological product, and pharmacy services included 12 weeks of NRT and 5-10 minute one-on-one behavioural sessions. They found CO-validated 4 week quit rates of 18.6% in pharmacy services and 34.5% for groups. The quit rates were measured by a number of socioeconomic indicators, and all showed lower cessation rates in low SES groups, but the difference was only significant for smokers using pharmacy services. The authors argued that this difference in impact would probably widen over a longer follow up period.

A descriptive study of the use of cessation services in South Derbyshire found that just 30% of smokers were aware of NHS cessation services and 5% used them [71]. Although there was no significant difference in desire to quit by a composite measure of SES, smokers from higher SES groups were more likely to be aware of NHS cessation services and to quit.

Another study reported the findings of an equity audit of NHS cessation services in Blackpool, Fylde and Wyre [69]. Service users who had reported a four-week quit were selected from the NHS dataset, in proportion to the size of the three PCTs, and asked about their 12 month quit success. 16.8% self-reported they were quit at 12 months. The authors concluded that the service had narrowed health inequalities as Blackpool, the most deprived area, had the highest number of users. However, it also had the largest total population. Also the analysis only included smokers who had recorded a four-week quit, and so did not take into account those who had not quit at four weeks in the twelve month quit rates.

In 1995 a cessation service was established in Christchurch, New Zealand which combined education and heavily subsidised NRT. A recent article examined its impact on area-based inequalities in tobacco use, comparing outcomes for participants and city-wide prevalence estimates [74]. The service's client population was representative of the

estimated smoking population in terms of SES, but quit rates were significantly higher for the most affluent neighbourhoods (25.2% against 17.5%). However, due to higher uptake in deprived areas, the gap between the most and least affluent neighbourhoods was estimated to have narrowed by 0.2 percentage points, though this was not statistically significant.

One article studied a series of pilot cessation interventions for young people [75]. Four were with predominantly over 18 year olds and thus eligible to be included in this review. A midwifery intervention, which was also reported in another article [72], was based in a deprived community, used motivational interviewing with pregnant women and their partners, with NRT available if desired. It found higher cessation rates than the other youth projects, with 20% of participants having a CO-validated quit at 3 months and 12.7% at 12 months. The other three interventions took place in Angus, Moray and Polmont Young Offenders Institution [76]. At three months follow-up the CO-validated cessation rates ranged from 6% to 12.6% and between 0 and 4.5% at 12 months follow up. There was no relationship between area-level deprivation and cessation rates at either follow-up point.

An article based in a deprived area in London attempted to boost engagement with the NHS Stop Smoking Services in North Fulham [72]. Researchers telephoned all patients recorded as smokers at two GP practices, to ask if they would be interested in quitting. Of 388 smokers contacted 53% were interested in quitting, 39% accepted the offer of a referral and 7% set a quit date. 4.1% of those contacted set a quit date and were abstinent at 4 weeks follow up. It was estimated that 1.2% would be abstinent at 12 months. The abstinence rate was below the national average, but the authors suggested there could be a greater impact if co-ordination was improved with the cessation service.

A pair of randomised control trials in Wisconsin examined the impact of behavioural sessions combined with 8 to 12 weeks of single or combined pharmacotherapy (bupropion, nicotine patch or lozenge) compared to placebo [74]. The data were pooled for analysis to improve statistical power, with a total of 2850 participants. Higher levels of education were significantly associated with cessation at 8 weeks and 6 months follow up. The low-educated participants were least likely to quit followed by mid-educated participants with high education participants having greatest quit rate. Combination therapy appeared to be more effective than using a single type of pharmacotherapy, but quit rates were still lower for low education smokers.

One article looked at the association between the characteristics of Montana Quitline callers and their choice of 12 weeks reduced cost varenicline or 4 weeks of free NRT [75]. Of 9133 quitline callers 7600 chose some form of pharmacotherapy. Varenicline users had significantly higher cessation rates than NRT users at both 3 (22% and 13%) and 6 months (17% and 11%). Adjusted odds ratios showed that insured quitline callers and those with 12 or more years of education were significantly more likely to use free NRT. Insured callers were also significantly more likely to be abstinent at 3 months but not at 6 months.

A pilot randomised control trial tested two motivational interviewing approaches among homeless smokers in Kansas [77]. Forty-six participants were randomised to either smoking cessation motivational interviewing sessions or sessions with a broader focus, incorporating other life events such as drug addiction (described as smoking plus). All

participants received five counselling sessions, six group sessions and eight weeks of NRT. Seventy-two percent of the participants attended at least three individual sessions, but only 41.3% attended at least three group sessions. The attendance figures for the individual sessions were likely to have been affected by participants being rewarded for attendance with gifts totalling \$110-135 per participant over the course of the intervention. At eight weeks follow up three participants in the smoking group were quit compared to four in the smoking plus group. By 26 weeks follow up one from the smoking group had relapsed. Although the cessation rate was promising, it is unsafe to draw conclusions from a small pilot sample.

An intervention in rural West Virginia aimed to improve cessation rates among under-served rural and urban communities [80]. Smokers were recruited through local clinics and offered a medical examination along with an 8 week behavioural pharmacotherapy cessation programme. The article reported very high rates of smoking cessation, with 53.1% of smokers being quit at the last session they attended. However, quit success was measured by participants' status at the last class attended rather than a fixed follow up point (e.g. one or six months after quit date). Therefore, many relapsers would not be represented in these results. Quit rates were higher among participants with a higher education and income but these were not significant.

Three interventions were conducted among patients being treated for a medical condition. The first Australian study targeted people with a psychiatric disorder, randomising them to either eight motivational interview and behavioural therapy sessions and NRT or usual care [81]. Self-reported abstinence was closely associated with adherence to treatment sessions at all follow up points. The SES impact was not discussed directly; however most of the study participants had not completed high school and were receiving welfare. The second study assessed outcomes for 3398 hospitalised and ambulatory patients who attended a USA hospital based cessation clinic [82]. Cessation rates at six months were 32% for hospitalised smokers and 24% for ambulatory patients. Multiple logistic regressions showed no significant association between education and outcome. The third study was targeted at patients scheduled for elective surgery at four hospitals in Stockholm [83]. Patients received either four weeks of weekly meetings or telephone counselling in addition to free NRT, or usual care. The intervention group had significantly higher quit rates pre-operation (36% - 2%), and one year post-operation (33% - 15%). The outcomes were not assessed by SES according to intervention and control groups, but among the entire sample there was no association between education or employment and cessation.

An intervention in El Paso, Texas targeted low-income migrant smokers when they visited the outpatient clinic [84]. Nearly two-thirds (63%) of participants reported that they were quit at 8-12 weeks and 44% at six months, showing a comparatively high quit rate.

Four interventions were targeted at low-income African-American neighbourhoods in the United States. The findings of these interventions may be slightly less relevant to the English situation given the focus on this specific ethnic minority. The first of these discussed a pilot community intervention run at six sites in Chicago [85]. Fifty smokers were given six counselling sessions and free nicotine patches which were provided at the end of each session in the first month. Adherence was high: 74% attended all sessions and

86% used nicotine patches, with 51% using at least 75% of their prescription. CO-verified abstinence was 34% at one month, and 22% and 18% at three and six months, respectively. The authors concluded that the intervention was promising; however, the quit rate may have been boosted by relatively restrictive selection criteria.

Another intervention targeted public housing developments in Georgia, randomising the developments between control and experimental conditions [86]. The intervention was nurse-led, free NRT was provided and community health workers (peers) also provided weekly contact aimed at enhancing the wellbeing and self-efficacy of participants. Control group participants received just general health advice. Smokers in the intervention group were over six times more likely to report a successful quit than the control group (27.5% vs 5.7%) at six months. Although the neighbourhoods were low income, there was no further relationship between education or income and cessation.

The third intervention targeting African American communities was a randomised control trial in Minnesota aimed at determining the predictors of adherence to nicotine gum and counselling among light smokers [87]. Randomisation was 2x2, i.e. participants received five weeks of either a counselling intervention or health education (a control behavioural session) with eight weeks of either nicotine gum or a placebo. A total of 755 smokers was randomised between the four groups. Adherence to gum/placebo was 36.6%, with no significant difference between these groups. Nearly three-quarters (71.8%) adhered to the counselling sessions. Surprisingly, the lowest adherence was within the active group, combining NRT and motivational interviewing (62.4%), whereas the placebo and health education intervention had the highest adherence (78.8%). Quitting was also higher with the placebo and health education intervention, though adherence generally increased quit rates. Multivariate regression showed a significant relationship only between high school graduates and higher rates of adherence, while income and employment showed no significant association with either outcome. A similar intervention from the same authors randomised smokers to either counselling cessations with a smoking focus or a health eating focus, and eight weeks of NRT [88]. Again, the rate of attendance was very high, and higher among the control group. There was no significant difference in quit rates between the intervention and control groups at eight weeks or six months.

A slightly different study examined the impact of subjective social status, i.e. the perception of being relatively low status in society, on relapse during the acute withdrawal period of the first two weeks of a quit attempt [89]. Depression and stress were negatively associated with being quit at one week and a positive mental attitude was positively associated with being quit at week one. The association with depression and mental attitude was still significant at two weeks and after adjusting for participant characteristics. After adjusting for these factors and socio-economic status, low subjective social status was a significant predictor of relapse at weeks one and two.

Summary

Some interventions have been effective in increasing relative uptake or reach among low SES smokers and/or those from deprived communities, though quit rates have been found to be relatively lower for low SES smokers. Two studies concluded that these services were having a narrowing effect on inequalities in smoking prevalence ie the higher reach more than compensated for the lower quit rate. However, the evidence base is too varied to draw firm conclusions about which are the most effective interventions.

2.3.3.2 Behavioural interventions

Behavioural interventions are defined as face-to-face services which focus on encouraging and enabling participants to quit smoking, but do not provide pharmacotherapy. They include both individual and group counselling sessions, and patients may in some instances use pharmacotherapy not provided by the intervention. The unpublished review found one article which indicated that behavioural support alone could have substantial benefits, but two interventions found that they were no more effective than the control.

Primary studies

The literature search found seven articles that assessed behavioural interventions and in relation to socioeconomic status [107-112], with each targeting a specific population ie pregnant women, patients in cardiac care units, blue collar workers, low income women and deprived communities.

Two of the interventions targeted pregnant women. The first conducted a quasi-experimental trial of a cessation intervention [107] and the other was a randomised control trial of post-partum relapse prevention [109]. The cessation intervention's experimental group reported a significantly higher rate of quitting than the usual care group during and after the pregnancy. Education level was significantly lower among smokers than abstainers at all time points, suggesting the intervention was more effective for higher SES groups. The relapse prevention intervention [109] was carried out among a mainly low-income population, and compared a motivation and problem-solving approach which was continually tailored to the participant's motivational state to usual care. Quitting rates were significantly higher for the intervention group, and was more effective for those smoking more than 7.5 cigarettes per day than lighter smokers. Higher levels of education were associated with higher rates of adherence, which may have been influenced by rewards such as gift cards for attending.

A randomised controlled trial in Canada targeted smokers in cardiac care units, providing a total of 246 patients with either two months of follow-up counselling calls or usual care [110]. The intervention showed very high levels of self-reported abstinence at 12 months (69% in the intervention group, 48% in usual care). A third (34%) of patients used pharmacotherapy, and although its use was also a predictor of abstinence it did not account for the difference between the two groups. Participants with more than a high school education were significantly more likely to report abstinence than those with less than a high school education, suggesting that the intervention may slightly widen health inequalities.

A tailored motivational approach was also used in an intervention to encourage smoking cessation and healthier eating in the United States among trade union members in blue collar jobs [111]. Participants were randomised to receive either telephone calls and self-help materials tailored to their needs and work experiences or no support. At 6 months the intervention group reported significantly higher 7 day abstinence rates than the control (19% compared to 7%).

A more complex tailored approach was used in a pilot intervention targeted at low income women in Canada [112]. Forty-four smokers were offered one to one and group support provided by peer facilitators, supported by professionals. The intervention used a more holistic approach, providing emotional support and helping to tackle participants' social

and economic problems, rather than targeting smoking specifically. Many of the women reported that they had gained a wider social network and better social support and four reported that they had quit smoking. However, the paper reports that the average cigarette consumption per day was less than one, which implies that many participants were not daily smokers.

Two interventions targeted deprived communities with low levels of engagement. One focused on smokers in rural communities in Kansas [108] and the other targeted communities in north-east Ireland [15]. In Kansas smokers were offered six motivational interviewing sessions by telephone over six months, with the option of repeating the sessions for up to four cycles. Engagement fell considerably after the first cycle of treatment, with higher SES participants (measured by income, education or health insurance) far more likely to remain engaged. The Irish study sought to evaluate the effect of providing lay health advocates and one-to-one and group support in community centres for six months. They randomised communities between experimental and control conditions, and measured the change in smoking prevalence in each community twelve months on. The intervention attracted 213 users, compared to an average of 11 users per year at the previous hospital based service. One in ten (9.9%) reported that they were still abstinent at 12 months follow up. The intervention communities' prevalence fell by 0.6% while the control community saw a 0.8% increase.

Summary

Only two primary studies assessed the equity impact of behavioural interventions with broad population groups ie pregnant smokers and patients in cardiac care units. Both found a reverse equity impact, i.e. widening smoking-related inequalities.

2.3.3.3 Pharmacotherapy interventions

Primary studies

Four articles examined the use and/or efficacy of pharmacotherapy as a stand-alone intervention to encourage smoking cessation [113-116].

Three employed a cohort study design, following pharmacy clients covered by Medicaid in Minnesota [113], patients at a specialised smoking cessation clinic in Spain [114] and low-income smokers in a rural county in New York [115]. The other was a cross-sectional study of quit methods in the USA, which documented the socio-economic variations in cessation aid use [116].

The first of the cohort studies studied patients treated at a smoking cessation unit in Barcelona between 1995 and 2001, where patients were offered one of a range of cessation products [114]. Patients were followed for a year after their treatment ended, with a final survey administered early in 2003, a mean follow up period of 52 months. The study found that among both men and women, lower socioeconomic status (whether measured by social class or education) was associated with a higher rate of relapse. This association persisted after adjustment for confounders and despite motivation to quit being equal among all social groups. However, during this intervention and lengthy follow-up period it is possible that changing tobacco control policies and social perceptions of smoking influenced study outcomes in addition to (or possibly rather than) the intervention alone.

The second focused on a low-income sample of smokers who had been prescribed NRT (bupropion excluded) in Minnesota [1013]. Patients received a follow up call or letter, with a mean follow up period of 8 months, to assess 7 and 30 day self-reported abstinence. Nineteen percent of males and 11% of females reported that they had been abstinent for 7 days. Unemployed women had a higher abstinence rate than employed women, whereas employed men were more likely to be abstinent than unemployed men. Assessing the equity impact of the intervention is difficult as it is unclear as the accuracy of the SES categories is open to argument. The sample was relatively highly educated, with 53% of females and 38% of males having at least some college education. Surprisingly, unemployed women had a higher rate of college education than employed women.

The final cohort study followed a group of smokers who volunteered to participate while at the Department of Social Security in Erie County, New York [115]. These participants completed a baseline survey and were followed up three years later, with a follow up rate of just 34%. Participants were asked about a number of aspects of smoking cessation, including their current smoking status and their use of pharmacotherapy. Thirty-seven (4.6% of the total sample) reported that they had successfully quit smoking since the initial interview, while use of pharmacotherapy doubled (from 26.6% to 51.9%). This suggests that the use of pharmacotherapy was increasing among this low-income population. However, these results are likely to over-estimate cessation rates and use as a result of sample bias (using volunteers) and sample attrition (poor follow up).

The cross-sectional survey analysed data from two national surveys representative of the USA population, including seven waves of the National Consumer Survey (NCS) between 1995 and 1999 and the 2000 National Health Information Survey (NHIS) [116]. In both datasets smokers with lower levels of education were less likely to try to quit and were less successful when they did so. Smokers with 16 or more years of schooling were 34-67% more likely to have succeeded in their quit attempt than those with 12 years of schooling. In the NCS dataset 25.5% of those attempting to quit used some form of pharmaceutical aid, with a 19.6% self-reported quit rate (compared to 18.7% for those using cessation programmes and 22.2% using no cost methods), and in the NHIS dataset 20.1% of quitters used pharmaceutical aids with a 17.9% quit rate (compared to 14.5% and 22.9%, respectively). In the NCS dataset smokers with 12 years or less schooling were more likely to have used a pharmaceutical product, but those without health insurance were less likely to use a product.

Summary

Two primary studies with broad populations found that using pharmaceutical aids alone increases socio-economic inequalities in smoking as lower SES smokers had relatively lower quit rates. This evidence is insufficient to be able draw conclusions about the equity impact of pharmacotherapy.

2.3.3.4 Brief interventions

Brief interventions usually last just a few minutes and are defined by NICE as involving 'opportunistic advice, discussion, negotiation or engagement' [117]. The recent unpublished review found four articles which studied the impact of brief interventions, and concluded that they have poor outcomes. Only one of the four interventions was

associated with a decrease in smoking rates among a low SES population, and some evidence indicated that repeated exposure was counter-productive for some smokers.

Three original research papers [118-120] and one review [13] examined the impact of a brief interventions to reduce smoking. All three primary research papers originated in the USA, and included a cross-sectional study [118], a cohort study [119] and a case control study [120]. Only two of the articles were specifically targeted at socio-economically deprived populations [119, 120].

Review

One article made an attempt to review the equity impact of tobacco control interventions [10]. Including literature published between 1980 and 2004 the review yielded two studies of brief interventions. The articles found a reduction in smoking prevalence of up to 5%; however, the effect was smaller among lower SES groups, whose members were less likely to visit their GPs for preventive health reasons.

Primary studies

The cross-sectional paper used data from the National Health Interview Survey 2001 to explore the association between smokers receiving advice from a healthcare provider during the previous twelve months and self-reported smoking cessation [118]. They collected the survey responses from all who reported being either a current, regular smoker (n=7662) or had quit smoking within the last twelve months (n=712), and had received brief advice from a healthcare provider to stop smoking during a medical visit in the last twelve months (5512 of the 8374). The study found that daily smokers and smokers with health conditions were more likely to be advised to quit than occasional smokers. Those who had received brief advice were more than twice as likely to quit smoking (14.7% compared to 6.9%, $p<0.001$). They found no association between level of education and cessation outcomes. However, 46.2% of the study population had at least some college education, which suggests that higher educated groups were more likely to receive brief advice from their healthcare provider.

The cohort study looked at the role of life-events, including clinic smoking interventions, on smoking outcomes among a cohort of 943 predominantly low-educated African American women in Chicago [119]. Participants who used one of the intervention prenatal, family planning and paediatric clinics between November 1994 and July 1996 were followed up at 2, 6, 12 and 18 months to assess whether they had achieved 7-day self-reported abstinence from smoking. During this follow-up period many participants received further brief interventions to encourage cessation from their health providers. Exposure to the brief intervention and subsequent brief interventions was associated only with greater motivation to quit, not with abstinence.

The case control study explored the role of social support on cessation outcomes among low-educated women with a recent history of depression [120]. Participants were offered a self-help booklet and encouraged to watch a video intended to improve their readiness to quit. The study was limited to women with no more than a high school education, while the comparison group was recruited through random digit dialling. The intervention showed no significant impact on self-reported 7 day point prevalence abstinence at any follow up point over the course of 24 months. However this may be a consequence of the non-randomised design: participants in the intervention group were significantly more

likely to have a low income (<\$25,000, $p<0.01$) and more likely to be heavier smokers than the control group, characteristics that are associated with lower cessation rates.

Summary

There is insufficient evidence to draw conclusions about the impact of brief interventions on smoking inequalities.

2.3.3.5 Quitlines

Primary studies

Seven articles contained some evidence on the differential impact of quitlines by socioeconomic status [19, 41, 115, 121-124]. Five of the interventions were based in the USA and two in Australia. Three of the articles focused on low-SES smokers, three briefly discussed the SES impact within a broader context, and the final one only presented SES data in a table.

The three broad interventions each used slightly different approaches. The first followed a cohort of quitline users in Minnesota to assess the effect of adding free NRT to the service [121]. The number of quitline callers, quit attempts and self-reported success increased significantly, producing an eightfold increase in the service's impact. There was no difference in the SES of callers (as measured by education) after NRT was added. However, college educated callers were more than twice as likely to quit than those with high school education or lower, though this relationship was not significant after adjusting for other baseline characteristics. A second study, from Australia, sought to determine the effectiveness of actively recruiting smokers to a quitline [124]. They wrote to 48014 randomly selected entries in the phone directory, and recruited 1562 of the 3008 eligible smokers that were found. Compared to the state's smoking population, university educated smokers and those with under 10 years of education were over-represented in the recruited population. However, 68% of those recruited said they had no intention of quitting in the next month, so it is difficult to determine the equity impact of the intervention.

The third article examined awareness of the state quitline, and the level of interest in using the service [121]. Using a telephone survey of smokers in New York they found that around 60% of those surveyed had heard of the service, mainly through television advertising. Among those who hadn't heard of the quitline 54% said they would be interested in using it. Both smokers with a lower income and those with a high school education or lower were significantly more likely to show an interest in the service than higher income/college educated smokers. This suggested a high level of untapped interest among lower SES groups. However, no follow up was conducted to see whether the hypothetical interest was transferred in to action.

One targeted intervention also studied quitline awareness and use, based on a cohort study of low income smokers in a county in New York State [115]. At baseline the quitline had been running for two years, and only 32.5% of those surveyed were aware of it. Three years later awareness had risen to 73%, with 11% reporting that they had used the quitline, compared to 4.2% in the first survey. However, the follow up rate was just 34%, so some of the difference can probably be attributed to this. One in seven (14%) of the smokers reported that they had successfully quit since the first survey, though it was unclear whether this is a result of the quitline or other cessation services.

Three articles studied the differential response of smokers to quitlines offering free NRT therapy [41, 122, 123]. The quitlines were in New York City [41], Washington State [118] and South Australia [123]. In New York City the NRT programme was a new intervention open to all callers, in Washington State the article studied the effect of widening eligibility to an NRT programme which was previously only available for young uninsured or Medicaid callers, and in South Australia subsidised NRT was targeted at smokers from low-income neighbourhoods to encourage use of the quitline service. In New York City quitline enrolment fell among higher income neighbourhoods after the NRT offer, but remained stable among low income neighbourhoods. The free NRT appeared to be particularly effective in recruiting young adult women from low and middle income neighbourhoods. There was no relationship between neighbourhood income level and adherence to the nicotine patch treatment, with approximately 75% of participants using most of their patches in all neighbourhoods. In Washington State there was no significant relationship between education and quit rates, with an average quit rate of 31% at three months, and satisfaction with the service was also high across all groups. In Australia the study sample was all low income. Participation was 2.5 times higher among those offered free NRT, and self-reported quit attempts were significantly higher at both 3 and 6 months, but not 12.

Summary

Adding a free or subsidised NRT component to a quitline has a positive effect for all socioeconomic groups. Evidence of an equity impact is equivocal with few studies comparing quit rates by SES.

2.3.3.6 Internet

Reviews

A recent Cochrane review examined the effectiveness of internet-based smoking cessation interventions [14]. Based on an evaluation of 20 trials of varying intensity there was some evidence that interventions which were appropriately tailored to their users and had frequent contact with users were effective aids to a quit attempt. The review did not look at the equity impact of included studies. However, two of the articles included in the review did examine the equity impact of internet smoking cessation interventions [18, 124]. One of the articles used a cohort study [41] and the other implemented a randomised control trial [18].

The cohort study focused on smokers' interest in an internet smoking cessation programme and found a similar pattern. Members of two healthcare organisations received letters and were exposed to advertisements in the organisations' newsletters. Of those invited 4% enrolled in the service, comparable to other services, but these registrants were significantly more likely to be higher educated: 56.3% had some college education and 7.3% had a post-graduate degree.

The randomised control trial used a control site which focused on increasing physical activity [18]. It found that the smoking cessation intervention had no significant impact, with no statistically significant difference in self-reported cessation rates of in the intervention (9.7%) and control groups (10.4%) [18]. Randomising users between a smoking cessation intervention and a physical activity intervention is likely to have influenced the outcome. Smokers were recruited through internet advertisements and were only eligible to participate in the study if they were willing to quit smoking in the next 30 days. Therefore, both study groups were likely to see high rates of cessation

regardless of their exposure to a cessation intervention. The high cessation rates may also be attributable to the relatively high rate of education in both groups: 40.7% of participants had some college education and 27.5% were college graduates. Given the lack of impact of the intervention the authors pooled the results of both groups. They found that higher education was associated with abstinence at both three months (OR=1.50, 95%CI 1.24-1.83) and six months (OR=1.31, 95%CI 1.09-1.57).

Primary studies

Three papers were identified and included a cohort study and two randomised control trials. The cohort study was based in Minnesota and featured expert services, peer-support and interactive tools [126]. New registrants during a 10-week period in 2004 were invited to participate in the study, and researchers tracked their site use and conducted a follow-up survey after 6 months. At follow up 9.7% of the participants reported that they had been abstinent for 30 days. There was no association between abstinence and socio-economic status. However, the sample was relatively high SES: only 18% had a high school education or lower, 48% had some college education and 33.9% were college graduates. Although some of this may be attributable to selection bias it appears that the intervention appealed more to higher educated smokers.

The two randomised control trials employed slightly different approaches. One used a control site with only downloadable smoking cessation information [127] and the other consisted of four components and randomised participants between high and low levels of each of these components [128].

The first RCT provided a tailored behavioural intervention to one group, while the others were directed to a non-interactive control site with self-help material [127]. The participants were recruited through an advertisement placed on <cancer.org>, and were predominantly white and well educated (76.7% having at least some college education). The intervention group was significantly more likely to report 30 day abstinence at 12 month follow-up (OR=1.44, 95%CI 1.06-1.96, p=0.02). At 12 month follow up high school graduates (OR=0.60, 95%CI 0.40-0.91) and smokers with some college education (OR=0.73, 95%CI 0.45-1.00) were less likely to report abstinence than college graduates, and a similar pattern was found at 3 and 6 months.

The second RCT varied the level of content that participants received [127]. Smokers were randomised between receiving high and low levels of outcome expectations, tailored feedback, success stories and message personalisation. Intervention delivery was also randomised, with some participants receiving all materials as a downloadable handbook while others received content over the course of five weeks. Heavier website users had a higher cessation rate at 6 months. Those using 3-5 sections of the site were more than twice as likely to quit. Engagement was significantly lower among smokers with a high school or lower education, opening an average of 2.2 sections of the site compared to 2.5 among those with more than a high school education. Those with a lower education were more likely to disengage from the intervention and therefore less likely to be abstinent at 6 months.

Summary

Internet smoking cessation interventions attract more smokers with higher SES and are more effective for smokers from higher socioeconomic groups.

2.3.3.7 Other cessation interventions

Primary studies

Four articles discussed smoking cessation interventions that do not fit in to the previous categories. They include an automated telephone follow-up system that responds to the patient's voice [129], a health promotion programme [130], computer-generated feedback reports [131], and a quit and win contest [20].

The first of these interventions is the interactive voice-response (IVR) telephone follow up system [129]. The IVR system is an automated telephone call which asks participants a series of questions about their quit attempt, and highlights any patients who have relapsed, or fear that they might in the near future and would like additional treatment. One hundred patients recruited to a behavioural and pharmacological intervention at a cardiac facility in Ottawa were randomised to receive either usual care (no further treatment) or automated IVR calls three, 14, and 30 days after being discharged. The pilot study did not find any significant difference in quit rates between the intervention and control groups. This may be attributable to the small sample sizes and a significantly higher proportion of highly educated people in the control group. There was no significant difference in quit rates by education level.

A study of a health promotion programme targeted at manual workers, union members at trucking terminals in the Eastern region of the United States [130], measured the associations between a number of employee characteristics and participation in the intervention through a survey. It found that smokers who worked night shifts, had some concerns about exposure to hazards at work, and who had some intention to quit were significantly more likely to quit than their peers.

The third intervention used computer-based questionnaires which generated a five page feedback report to advise participants on the next steps in their cessation attempt [131]. The article collated the findings of five interventions conducted between 1990 and 1995 in which participants completed these questionnaires at either baseline, three and six months or baseline and six and twelve months. Each intervention recruited different population groups: a random-digit dial sample, HMO members, school parents, patients from a health insurer and a worksite sample. A sixth (17.7%) of participants who were contacted at 12 months claimed that they were abstinent, with the figure rising to 23.6% at 24 month follow up. If participants who did not respond to follow up calls were included as failed quit attempts, in line with usual practice, these abstinence are reduced (10.9% and 12.7% respectively). Higher education was found significantly to increase the chances of abstinence. After adjusting for other individual characteristics, participants with over 16 years of education were still significantly more likely to be abstinent at both follow up points.

The Quit and Win contest took place in the Netherlands in 2005 [20]. Participants were encouraged to quit smoking for at least a month with all who self-reported one month abstinence entered in to a draw for a €1,000 prize and 11 regional prizes of €450. Self-reported quit rates were 4.7 times higher among contestants than a control group at 1 month follow up, and 2.46 higher at 12 month follow up. Higher education was significantly associated with successful cessation at one month (OR=1.199, $p<0.05$), but was not significant at one year follow up. However, these results may overstate the impact of the intervention. The control group was very small and less likely to quit based

on their individual characteristics, and the prize was a substantial incentive for contestants to lie about their success.

Summary

Findings from four studies of a heterogeneous set of cessation interventions either found no impact by SES or a greater benefit to higher SES participants.

2.4 Discussion

This review has systematically assessed the available evidence on the impact of population and individual level tobacco control interventions on socioeconomic inequalities in adult smoking. The review updated and expanded a previous review on the effect of population tobacco control interventions on social inequalities in smoking which included papers published before February 2006 [9, 10]. Our review included papers covering any aspect of tobacco control, ie population and individual levels, published since January 2006 which had carried out some assessment of the equity impact of the policy or intervention with respect to socioeconomic status. Before presenting the main review findings it is important to consider the strengths and limitations of both the review and the available evidence.

2.4.1 Strengths and limitations of the review

The original intention to undertake a review of reviews was abandoned early in the project as few systematic reviews on tobacco control interventions were found to have considered their equity impact. Consequently, a review combining reviews and primary studies published since January 2006 was undertaken. While considerable attempts were made to include published and 'in press' studies, it is possible that some important studies might have been missed which had not been published in the peer reviewed literature and/or which were not included in previous reviews because of their inclusion criteria (eg study design) but which would have met the inclusion criteria for this review. It is also possible that some papers included in previous reviews did include some assessment of equity impact but this was not reported in the review. Finally, because of limited project resources it was not possible to undertake a formal assessment of the methodological quality of the included papers. However, data extraction sheets were completed for all the papers, with the internal and external validity of each paper being assessed by at least two members of the review team. As we wanted to include all types of study design, and in order to provide a simple basis for comparing the methodology of each paper, we devised a typology of study designs (Table 1).

2.4.2 Strengths and limitations of the available evidence

There are major limitations in the available evidence, most importantly the very small number of studies, and thus reviews, which have considered the equity impact of tobacco control interventions. For example, nearly all the Cochrane reviews were for this reason excluded from this review. Thus, we found little review-level evidence other than for mass media campaigns. The majority of the included primary studies focused on individual cessation support rather than population level interventions. Many of these studies had limited follow-up periods, making it difficult to assess the long term impacts on quitting or smoking prevalence.

For several important areas of tobacco control, ie social marketing, restrictions on marketing, approaches to combating smuggling/reducing the blackmarket, smoke free homes interventions and financial or other incentives (Table 3), we found no evidence on their equity impact. For several other types of interventions, relating to individual level cessation support (eg quitlines, quit and win, computer generated support) and multifaceted community programmes, the data was judged to be insufficient to be able to draw any conclusions.

While it was not possible to undertake a formal assessment of the methodological quality of the included studies, many were pilot or feasibility studies and/or involved small numbers of participants. Thus their findings may not be replicable. A small number of papers which had been included in previous reviews, were not from peer reviewed publications. In order to include as much relevant evidence as possible, many of the primary studies included in this review would not meet the criteria used by other systematic reviews such as Cochrane as they had a non-experimental design with no comparison group. However, more experimental designs are often either not feasible or inappropriate for evaluating certain types of tobacco control interventions such as NHS cessation services, national media campaigns and local social marketing campaigns.

The dominance of studies from the United States raises concerns about their generalisability and potential transferability or relevance to the current English context. This was because they either focussed on specific populations notably US ethnic minorities (eg Afro-American, Latino) and/or because tobacco control in England has progressed beyond that operating in the communities/populations when the studies were carried out. Notably the national smokefree legislation and the universal provision, through the NHS, of free cessation support and subsidised or free pharmacotherapies. In addition studies were included which were targeted specifically at low SES populations. While these studies can provide evidence about uptake and impact of tailored interventions in these populations, it is not possible to assess their equity impact.

Finally, a range of indicators of SES were used in papers (eg education level, income, health insurance status, deprivation area, combined indexes) which made comparisons with British studies difficult. For example, many non-British studies used education level as a measure of SES but levels of educational attainment vary between countries and generations and are not widely used in British studies.

2.4.3 Main findings and conclusions

Relatively few tobacco control intervention studies have assessed their impact on socioeconomic inequalities in smoking. Out of an original 10,345 identified papers only 90 met the inclusion criteria and were included in the review (Table 2). The literature was international, with a large proportion of the studies being carried out in the United States. Most of the British studies assessed the impact of local NHS cessation services and the smokefree legislation in Scotland and England. There was little review-level evidence other than for mass media campaigns and most primary studies focused on individual level cessation support rather than population level interventions.

The limited nature and extent of the evidence base (see 3.2) considerably constrains what conclusions can be drawn about which types of tobacco control interventions are likely to reduce inequalities in smoking. Interventions have therefore been roughly categorised into several groups which reflect the strength, consistency, adequacy (ie number of

studies/reviews) and direction of the evidence on impact (Table 3). Among population level interventions the clearest and most consistent evidence of positive impact, ie reducing smoking inequalities, was for price increases. The group next strongest evidence included mass media campaigns and smokefree legislation, though each had their qualifications. There is review level evidence that mass media campaigns can have a negative or neutral equity effect. However, more recent studies and reviews which have explored message content and approach suggest that certain types of campaigns which are tailored to low SES smokers could have a positive equity effect. With respect to smokefree policies there is clear evidence that comprehensive smokefree legislation removes inequalities protection to exposure to secondhand smoke in low SES groups which are found when only voluntary or partial policies are adopted. The evidence on the equity impact on smoking behaviour is more equivocal. Qualitative studies have found potential equity benefits but quantitative studies have had less consistent findings.

For other types of population interventions the evidence was judged as either being insufficient or no evidence was found. This is of concern as these included some of the main forms of tobacco control activities being undertaken at the regional and local in England in recent years notably social marketing campaigns (including action addressing the tobacco blackmarket) and smokefree homes interventions (see Section 4), as well as policies being considered at the national level ie further restrictions on marketing (eg point of sale, plain packaging).

For individual level cessation support there is strong evidence that when effectively targeted at low SES smokers, services providing combined behavioural and pharmacological support can have a positive impact on smoking inequalities. The evidence is much more limited on what impact, if any, this might have on smoking prevalence at the population level. The evidence for other types of cessation support was judged as insufficient or likely to have a negative impact (ie increase inequalities). In relation to the internet studies it should be borne in mind that this is a rapidly developing field, both in terms of internet access in low SES groups and the type of support that the technology can deliver. However, as highlighted in the population level evidence, it is of concern that there is no evidence on the equity impact of one approach that has been increasingly rolled out at the local level, providing financial or other incentives for quitting.

Table 3 Summary of evidence.

	Evidence of impact on reducing smoking inequalities
Price increases	Strong positive - most evidence shows has relatively greater impact on low SES smokers.
Mass media campaigns	Low positive - content, tone and exposure have a major impact. Some recent evidence that if designed for and targeted at low SES groups might be more effective.
Smokefree policies in public places and workplaces	Strong positive - comprehensive bans remove inequitable coverage found when bans are voluntary. Medium positive - evidence on impact on consumption, quitting and prevalence by SES unclear. Some evidence comprehensive bans reduce children's exposure more in low SES homes.
Community programmes	Insufficient evidence - very limited evidence, mostly negative.
Social marketing campaigns	No evidence available
Restrictions on marketing	No evidence available
Combating smuggling	No evidence available
Smokefree homes	No evidence available
Cessation support:	
<i>Behavioural & pharmacotherapy</i>	Strong positive - small but significant smoking reductions, low SES smokers have lower quit rates but there is evidence can over-compensate for this if increase relative reach by targeting low SES groups. Low positive - limited evidence on impact on prevalence at population level.
<i>Brief interventions</i>	Insufficient evidence - can increase quitting but insufficient evidence on impact on smoking inequalities.
<i>Behavioural only</i>	Insufficient evidence - but all had a negative impact on smoking inequalities.
<i>Pharmacotherapy only</i>	Insufficient evidence - but all had a negative impact on smoking inequalities.
<i>Internet</i>	Negative - limited evidence but impact greater in high SES groups.
<i>Other</i>	Insufficient evidence - heterogeneous interventions but mainly negative equity impact.
<i>Quitlines</i>	Insufficient evidence - were all non-UK studies providing free or subsidised NRT to increase calls. Little evidence on impact on quit rates.
<i>Incentives</i>	No evidence available

3. A REVIEW OF SURVEYS AND ROUTINE DATA ON ADULT SMOKING (PREVALENCE, CONSUMPTION, QUITTING) AND SOCIO-ECONOMIC STATUS (SES) IN ENGLAND

3.1 Introduction

The data analysis presented in this section of the report assesses the extent of regional and socio-economic (SES) differences in smoking. It addresses the third and fourth project objectives:

3. To identify sources of data in England (surveys and routine data) on adult smoking amongst different social groups, in particular deprived populations.
4. To provide a review of what is known at the national (England) and local level on patterns and trends in adult smoking in different social groups and to use this review to suggest ways of improving data collection to allow commentary on the impact of tobacco control on smoking and inequalities.

This section is split into the following subsections: data sources, smoking prevalence, cigarette consumption and smoking cessation. The main findings and their implications are summarised in Table 4.

Questions on smoking and socioeconomic status are included in six national datasets that can be subdivided into regions. National surveys currently do not tend to subdivide below a regional level which is why regional level is adopted throughout this report. Below each dataset is introduced. The topics included in the main surveys are summarised and other resources and sources of local data are described and the methodology used in this analysis is described.

3.1.1 National datasets including information on smoking, socioeconomic status at a regional level

Six¹ national datasets including data on smoking and socioeconomic status which can be analysed by region (Table 5). The HSE, GHS and Omnibus include a plethora of socioeconomic and smoking variables. The BHPS has detailed information of SES but limited information on smoking whereas the STS collects detailed information on smoking but one measure of SES. The SSS statistics include all SSS clients rather than a sample but only basic information is provided. More detail about the advantages and disadvantages of each are provided below.

Smoking is one of the core topics The **Health Survey for England** (HSE), and thus is included every year. The HSE sample is stratified and clustered. Clustering may increase standard errors as people with similar characteristics tend to live in closer proximity. The cluster and strata variables are released so it is possible to calculate standard errors

¹ There are other national datasets that include these features which are not discussed here because they only include a subset of the population such as the English Longitudinal Study of Aging

Table 4 What does this study have to say about:

	What did we find?	What might this mean?
Smoking prevalence & socioeconomic status	<ul style="list-style-type: none"> As the gradient of disadvantage rises the chance of smoking increases exponentially the most disadvantaged are four times more likely to smoke than the most affluent but even one indicator of disadvantage increases the chances of smoking 	<ul style="list-style-type: none"> A reduction in the smoking rates of the most disadvantaged is likely to have the most impact on the inequalities gradient
The decline in smoking	<ul style="list-style-type: none"> Smoking is not declining among the multiply disadvantaged Since 2008 the decline in smoking among the more affluent may have ended The decline in smoking is the result of a higher proportion of never smokers rather than an increase in quitters 	<p>More research is needed</p> <ul style="list-style-type: none"> to examine how best to reduce smoking rates further but <i>must</i> differentiate socioeconomic status groups
Regional differences	<ul style="list-style-type: none"> Regional differences in smoking rates are mostly a reflection of the socioeconomic status, age and ethnic profile of their populations 	<ul style="list-style-type: none"> A reduction in regional socioeconomic inequalities may also reduce smoking rates
National datasets	<p>We found six national datasets covering smoking and socioeconomic status by region</p> <ul style="list-style-type: none"> In recent times the surveys are undergoing changes Accurate standard errors could not be calculated for many surveys Sample sizes are barely sufficient to calculate meaningful statistics by region in some analyses Sub-regional geographies are not routinely released which will be an issue when regional Strategic Health Authorities become obsolete and public health is administered by Local Authorities and NHS services are commissioned by GP consortia 	<p>We recommend that both the following be routinely provided with datasets:</p> <ul style="list-style-type: none"> GP consortia and local authority boundaries for commentary on the impact of tobacco control on smoking and inequalities – sample sizes may need to be increased Sample design (strata and clusters) – for analysis using complex samples statistics

Table 5 Information about national datasets including SES and smoking that can be analysed at a regional level

Name used in report	HSE	GHS	Omnibus	BHPS	STS	SSS statistics
Full name	Health Survey for England	General Household Survey	As above	British Household Panel Survey	Smoking Toolkit Study	Stop Smoking Service Quarterly statistics
Recent changes e.g. name	From 2011: Health Survey for England, Health, Social Care and Lifestyles	From 2008: General Lifestyle Survey (GLF). From 2009: module of the Integrated Household Survey (IHS)	From 2008: Opinions Survey	From 2010: subsumed into the United Kingdom Household Longitudinal Study (UKHLS).	From 2010: sample only followed up at 6 months (originally 3 and 6 months)	
Dates	1991-ongoing	1971-96, 2000/1-12. However IHS smoking status question will continue	1990-ongoing	1991-ongoing	2006-2011	SES available from 2008/9 to ongoing
Publisher	NHS IC	ONS	ONS	ISER	www.smokinginEngland.com	NHS IC
Data collection	annual	annual	Monthly but two smoking modules per year since ~2000	annual	Smokers and recent quitters from the monthly BMRB Omnibus Survey	quarterly
Sample size	~10000 per year (excluding boosters) varies from 6000-17000) aged 16+	~15000 per year aged 16 or over	~1800 per module	~10 000 (includes children and other UK nations)	~2000 per month	All clients included (~200 000 per year)
Response rate	64% (2008)	Range (2001-8) 69-76%	Available on request e.g. 59%	74% of wave 1 responded. 44% of original full interviewees ongoing	N/A – random location sampling used	Nearly 80% classified by SES 2009/10
Strata & cluster released	Yes	No	No	Yes – but complex as interviewees move	No	No
Sub regional geographies	No	IHS only - yes	No	Yes – some restrictions on use	No	Not by SES
References	132-134	135-137	138	139-143	144-146	147, 148

accurately and easily using complex samples statistics. The HSE provides a wide variety of smoking variables and all standard SES indicators. There was little change over the years in survey questions. The HSE appears to be continuing and in 2011 will be expanded to include social care information and will be renamed the Health and Social Care Survey [149].

The **General Household Survey** (GHS) changed from financial year to calendar year in 2005 and a longitudinal element was introduced. Each respondent is interviewed for four years with 25% respondents new each year and 25% being dropped each year. Since 2009 it has become a module of the ONS Integrated Household Survey (IHS) with the Living Cost and Food Survey, English Housing Survey, Annual Population Survey and Life Opportunities Survey and been renamed the General Lifestyle Survey GLF. A core set of questions are asked of all respondents in addition to questions on a specific module [150]. Smoking status is ascertained in the core module. The idea was that a large sample size would allow data to be broken down into more detailed geographies however due to funding restrictions various modules are being discontinued which will compromise the IHS sample size. The GLF module is one of the modules which will be discontinued in 2012 so only prevalence information will be available via the IHS core.

Cluster and strata variables, for calculating standard errors, are not released - instead deft statistics, which are used to calculate standard error for complex samples, are available for a selection of variables including smoking status. Deft statistics are not disaggregated by region. This means that standard errors cannot be calculated precisely by the user. The first report on the IHS does disaggregate some defts by region [151] so it is possible that in future smoking statistics will also be disaggregated. Originally the IHS sample was not going to be clustered which would allow simple random sample standard error to be used but this has been shelved currently [152]. It may however be possible to extract the core smoking status questions from the modules that do not use clustered sampling so that simple random standard error can be used.

Only standard error was thus available for this report rather than sampling error. Thus confidence intervals are narrower than they should be for the GHS analysis. For most of the analysis 2001-3 are compared with 2006-8. The latter period is affected by the longitudinal element. In these years a sixth of the sample was included once, a third of the sample was included twice and half the sample was included in all three years. This in effect reduces the sample size which again means that confidence intervals are too narrow. Where confidence intervals are too narrow and a non-significant effect is found (confidence intervals overlap) then it is likely that this is the case. However if a significant effect is found (confidence intervals do not overlap) then we cannot be sure that there really is a difference because the error has been underestimated. Furthermore with the longitudinal analysis if the relative positions of the regions regarding smoking rates changed over the three years then the percentages provided may also be inaccurate. A further change was the exclusion of proxy interviews from the smoking prevalence data from 2008 [153].

The **Omnibus Survey** was originally part of the IHS but was decoupled as only one member of the household is needed however some core questions are still harmonised with the IHS.

The Omnibus survey has a much smaller sample. Over the last decade smoking modules have been included in two surveys per year. Only about 100 cases are achieved from each region per month reducing the stability of estimates further [154]. Strata and cluster variables are not released. Defts are available for all survey variables upon request. They are not currently calculated within regions but this could be potentially possible.

The **British Household Panel Survey** (BHPS) aims to further understanding of social and economic change at the individual and household level in Britain [155]. Thus a wide variety of measures of socioeconomic status are included. Only two questions are consistently included about smoking: smoking status and cigarettes per day. Other questions have been included occasionally. It is carried out by the Institute for Social and Economic Research (ISER) at the University of Essex. When the BHPS became subsumed into the UK Household Longitudinal Study (UKHLS) in 2010 there was one off gap between interviews of between 16 and 30 months rather than the standard 12 months [155]. In the UKHLS biomedical data is also collected [156].

The **Smoking Toolkit Study** (STS) receives new data on about 2000 respondents each month [157] from the BMRB omnibus to provide a more detailed understanding of quit attempts and factors that may aid success in quitting. The BMRB Omnibus has a random location sample design, rather than the probability design the ONS uses, which means there is less likelihood of a socioeconomically representative sample.

The STS has a wide range of smoking variables. Socioeconomic status is measured through Social Grade (A, B, C1, C2, D, E). Findings from the Smoking Toolkit Study are published in scientific journals and on www.smokinginengland.info. Further analyses and on some occasions data may be made available on request to Jennifer Fidler j.fidler@ucl.ac.uk. Monthly data collection allows monthly trends to be measured. The collection of data on quit attempts is detailed but data collection only began in late 2006.

The **Stop Smoking Services** collect data on use of the services and quit rates four weeks after setting a quit date. The advantage of this dataset is that it includes all services users (the population) rather than just a sample. Four week quit rates are however very short term - in general at least six months of follow up are recommended [158]. There are also some concerns on the reliability of the data [159]. Published socioeconomic classifications are limited to NSSEC (see later for definition). Although postcode data is collected by SSS which could be appended to a deprivation index, it is not published.

All six datasets allow data to be analysed by Government Office Region (GOR). In future the IHS may allow analysis by other geographical levels such as Local Authority, parliamentary constituency and census output area by agreement [152]. The BHPS also includes the regional groupings used at the inception of the study in the standard dataset; more detailed geographies are available through conditional access, special licence access and grid references may be made available through application to the secure data service access [160]. The socioeconomic SSS data is provided at Strategic Health Authority level. These are the same as GOR except that the South East GOR can be split into South Central and South East Coast [161].

To summarise, the surveys are not simple random samples. Particular geographical areas (usually postcodes) are chosen to cut down on interviewer travel time. This clustering increases the standard error. Calculating standard error as accurately as possible is particularly crucial for analysis by region given that smaller regional sample sizes could lead to over interpretation of regional differences. The release of survey design variables (strata and cluster) which allow the user to calculate complex standard errors for confidence intervals makes the HSE the best source of smoking related national data even though the sample size is slightly smaller than the GHS/GLF. The HSE includes a wide variety of smoking related variables and SES indicators. The other advantage of the HSE over the GHS/GLF is that the survey has remained fairly stable since 2001 whereas the GHS changed from financial to calendar year in 2005, became a module of the Integrated Household Survey (IHS). Due to the smaller regional sample sizes and the difficulty acquiring data to calculate complex sample standard error, the Omnibus survey was not used. The BHPS also appears to provide sample design variables however only smoking status and number of cigarettes smoked per day are included in all waves. In this report the HSE shall therefore be the main source for analysis with some comparisons with the GHS/GLF, STS and SSS datasets. The main analysis period in this paper was 2001 to 2008 due to changes in variables in 2001 and data release dates. More recent data are included from the STS and SSS.

3.1.2 Available smoking related topics in these national surveys

This report includes data on smoking status and consumption however these surveys collect data on other smoking related topics. These include smoking uptake, family smoking, addiction, where cigarettes are purchased, brand of cigarettes, knowledge of the harms of smoking, passive smoking, prompts for quitting, NRT and other quitting aids, cutting down and attitudes towards smoke free legislation. The smoking variables available from the HSE, GHS, Omnibus STS and BHPS are presented in Appendix 1.

3.1.3 Other sources of sub-national data on smoking and SES

At a local level, the Association of Public Health Observatories (APHO) has developed an online tool to provide smoking profiles for PCTs and Local Authorities in table, chart or map form. The inputs are smoking attributable deaths 2006-08, smoking attributable deaths from heart disease 2006-08, smoking attributable deaths from stroke 2006-08, deaths from lung cancer 2006-08, deaths from chronic obstructive pulmonary disease 2006-08, smoking attributable hospital admissions 2008/09, cost of smoking attributable hospital admissions 2008/09, lung cancer registrations 2005-07, oral cancer registrations 2005-07, estimated adult smoking prevalence 2006-08, GP recorded smoking prevalence 2009/10, smoking in pregnancy 2008/09, successful quitters at 4 weeks 2009/10, successful quitters at 4 weeks (CO validated) 2009/10, completeness of NSSEC recording by stop smoking services 2008/09, prescribed NRT 2009/10. These data are not included in this report. They are available from:

http://www.lho.org.uk/LHO_Topics/Analytic_Tools/TobaccoControlProfiles/profile.aspx

The profiles were limited for many measures of tobacco control due to a lack of robust datasets. LHO have also created inequalities profiles:

http://www.lho.org.uk/LHO_Topics/Analytic_Tools/HealthInequalitiesInterventionToolkit.aspx

During the last decade each region appointed a dedicated tobacco control lead and the public health observatories (PHO) worked together on national outputs through the lead PHO (London). The PHO have performed regional secondary data analyses and have

occasionally commissioned research projects on tobacco control relevant to their region. Examples of available data are presented in Appendix 2.

3.1.4 Structure and Content

The analyses estimate cigarette smoking prevalence, consumption and quitting by SES and region between 2001 and 2009. For the most part data are presented graphically rather than tabulated. Tables are available in Appendix 3. The surveys provide data on pipe and cigar smoking. However in this analysis smoking refers to cigarette smoking.

This report includes the following: firstly an assessment of regional smoking rates for those with low and high socioeconomic status (SES) through calculating the percentage smoking in 2001 to 2003 and 2006 to 2008. Indicators of SES are first examined individually and then merged into a scale. The independent influences of region and SES are assessed alongside other factors in logistic regression models. HSE results are compared to the GHS and extended in time through the STS.

Secondly smoking consumption is assessed through the calculation of rates of heavy, moderate and light smoking in 2001 to 2003 and 2006 to 2008 and changes over time and the importance of region in comparison with other factors is explored (HSE). The analysis is extended to 2009 using the STS.

The final analysis section covers quitting smoking. The percentages who have ever quit smoking (HSE 2001-8 data are used and this section also includes exploration of changes in quitting and a comparison of the importance of region compared with other factors), quit in the past year (STS 2007 to 2009) and quit through SSS are assessed (2008-2010). All analyses were undertaken using SPSS 16.0.

3.2 Cigarette smoking prevalence by SES and region

3.2.1 Smoking prevalence (HSE) -methodology

The 2001 to 2008 Health Surveys for England were included in the analysis. The HSE regions are nine Government office regions (North East (NE), North West (NW), Yorkshire and Humber (YH); East Midlands (EM), West Midlands (WM), East of England (EE), London, South East (SE) and South West (SW)).

The following eight commonly used [162, 163] indicators of SES were employed: NSSEC (National Statistics Socio-Economic Classification), Registrar General's social class, index of multiple deprivation, lone parents, car access, housing tenure, income and unemployment (Table 6). Education was not included as preliminary analysis on 2008 data suggested that smoking rates were only lower among the highest educated. All indicators were dichotomised into low SES and high SES groups for comparability. Some indicators required a residual group of people who did not fit into either the low or high SES categories. These residual groups were included in the analyses but are not detailed further.

The main indicator of occupationally based SES in this analysis was NSSEC which is the current standard approach but RG social class was also included. RG social class was the government standard measure of occupationally derived social status prior to 2001. By

2001 the scale was about 80 years old and it was felt that its categorisation by skills and qualifications was outdated [164]. NSSEC is based on employment relations and conditions [164]. In this analysis the usual occupational division into Routine and Manual and Professional, Managerial and Intermediate is used. RG social class is often split into non-manual (I, II, IIIN) and manual (IIIM, IV, V). In this study however I, II, III (non-manual and skilled manual) were contrasted with IV and V (semi and unskilled manual) because this split showed a greater difference from the NSSEC results in preliminary analysis. NSSEC groups full time students, those who have never worked, those whose occupation is inadequately described and long term unemployed separately. These became a residual group.

Preliminary analysis suggested a stronger relationship between Household Reference Person (HRP) occupation with smoking than personal occupation, so HRP NSSEC and RG social class were used in these analyses. The HRP is the householder (the person in whose name the property is owned or rented); if there is more than one, the person with the highest income. If there are two householders with equal income, then the household reference person is the oldest [165].

The index of multiple deprivation (IMD) is a score given to each neighbourhood (ward in 2000 and low layer census super output areas (about 1500 people) in 2004 and 2007) calculated from several domains. In 2000 the domains were income, employment, health and disability, education, skills and training, housing and geographical access to services [166]. In 2004 and 2007 the first four domains were the same but the latter domains were barriers to housing and services, crime and living environment [167]. For 2001-2 the IMD 2000 version was used [168]. All later surveys use the 2004 IMD 145, 146].

Single parenting was operationalised as the respondent living in a household with children and only one adult as opposed to two or more adults. The second adult is not necessarily a parent: it could be an older sibling, grandparent or lodger etc. but it is likely that any other adult may contribute either economically or by taking on some parenting responsibilities. Households without children were separated into a residual category. The average age of household members in households without children tends to be higher which is associated with less smoking. Car or van availability was used in preference to car ownership as some households may have access to a car that they themselves do not own. The most common contrast of housing tenure groups is owners compared to renters. Here renters were compared to those buying with a mortgage. Outright owners tend to be older and therefore less likely to smoke for age related reasons.

Income in itself is not necessarily a good measure of financial restriction because the amount needed to provide a decent standard of living depends on how many people it needs to support. Therefore equivalised household income was used. Equivalised means that income was adjusted for the number of adults and children in the household. Due to small numbers of unemployed people and the differences in the government (ILO) definition and self definition of unemployment, unemployed respondents were combined with other economically inactive. Retired people have low smoking rates due to higher rates of quitting for health related reasons and smokers having higher mortality rates. Thus retired people were analysed separately.

Table 6 SES indicator description

Concept	Measure	Low SES	High SES	Other groups
Occupation	HRP NSSEC	Routine and Manual occupations (R&M)	Professional, Managerial & Intermediate (PM&I)	Other
Occupation	HRP Registrar General's social class	IV, V (semi and unskilled)	I, II, III (non manual & skilled manual)	
Neighbourhood	Index of Multiple Deprivation	Most deprived quintile	Less deprived quintiles	
Lone parents	Households with children	1 adult	2+ adults	Households without children
Transport	Car or van availability	No car or van available	At least one car or van available	
Housing	Housing tenure	Renting	Buying with mortgage	Owned outright, shared ownership, living rent free, squatting
Income	Equivalised household income	Lowest tertile	Higher tertiles	Missing
Unemployment	Economic status	ILO definition of unemployed and other inactive	Working	Retired

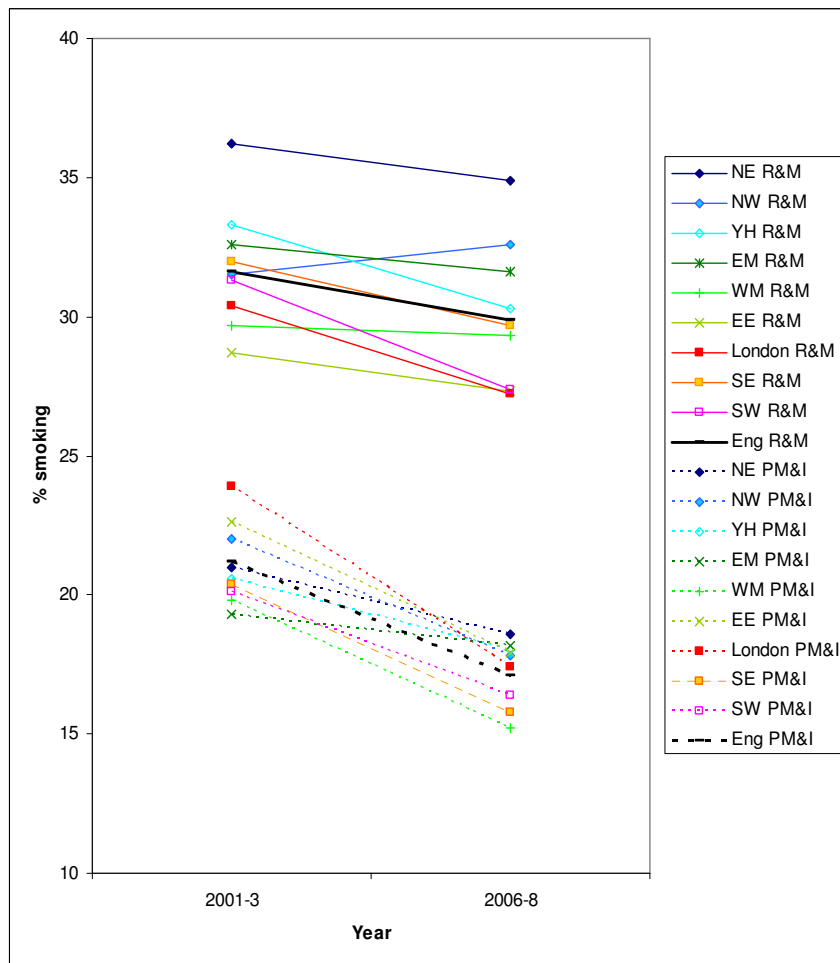
3.2.2 Smoking prevalence by SES and region over time (HSE)

The confidence intervals for each data point in the graphs in this section are presented in Appendix 3 table A3a1 and sample sizes in A3a2

3.2.2.1 Household NSSEC

There was a clear separation between respondents in Routine and Manual headed households and respondents from Professional, Managerial and Intermediate households. Smoking declined among those in PM&I households in every region whereas the evidence of a decline in R&M households was more slight. There was more regional variation among R&M households than PM&I. Higher rates were found in northern regions, particularly NE among those from R&M households. There did not appear to be systematic variation among PM&I households.

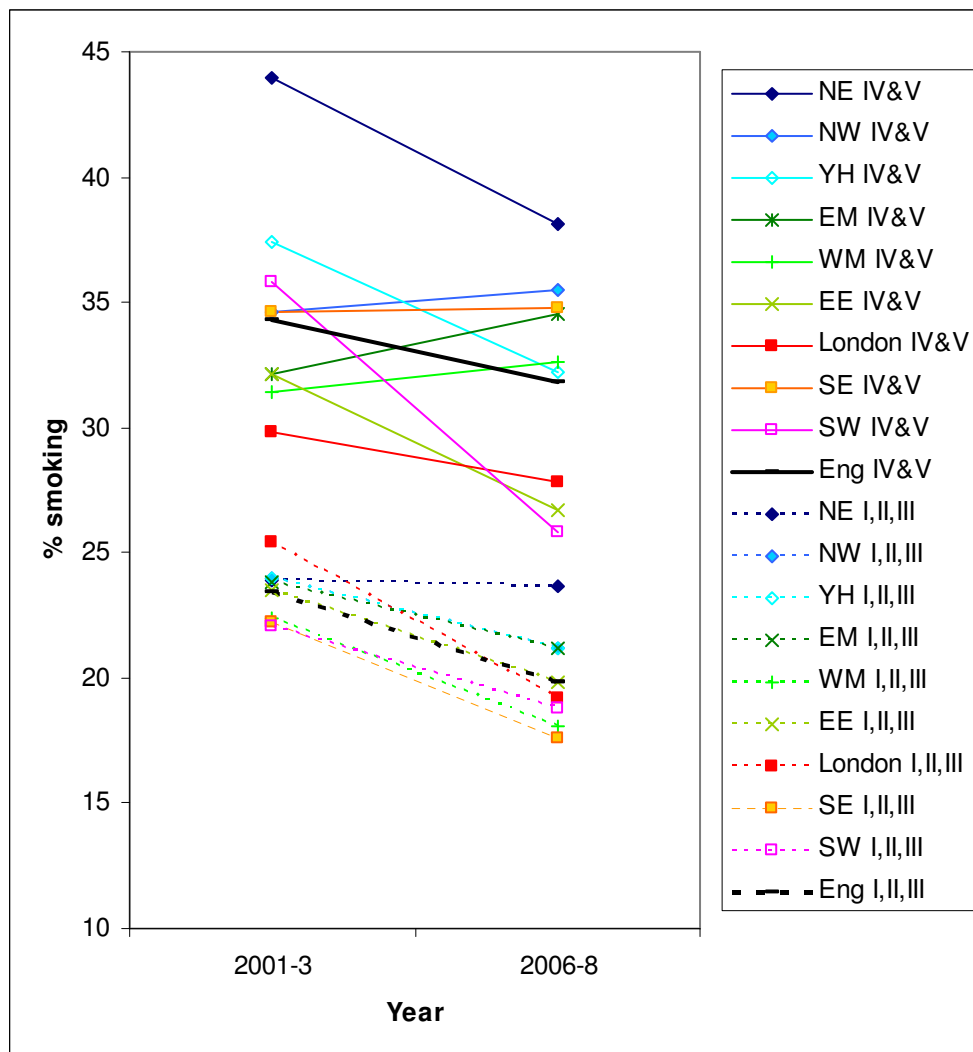
Figure 2 Smoking prevalence by year, regions and household NSSEC



3.2.2.2 Registrar General's social class

Household Registrar General's social class provided a somewhat more muddled picture than NSSEC. There was less separation between low and high SES. There was a significant decline in smoking among semi and unskilled workers in SW and there appeared to be no decline in classes I,II and III in the NE. Overall there was a similar pattern of more decline in the high SES groups than the low SES groups and higher smoking rates in northern regions, particularly NE in the earlier period.

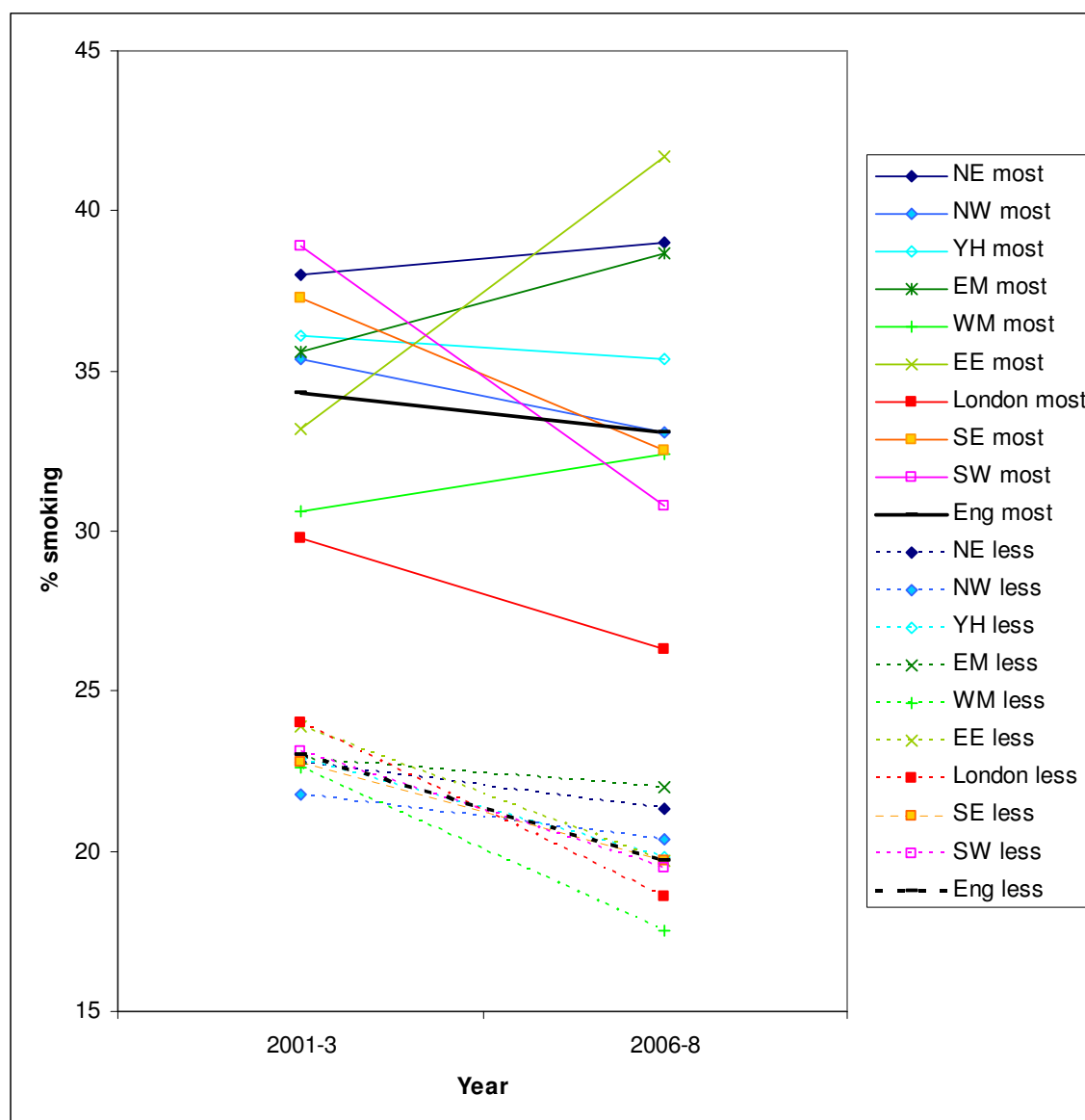
Figure 3 Smoking prevalence by year, regions and household RG Social Class



3.2.2.3 Neighbourhood Deprivation (index of multiple deprivation)

Respondents living in the most deprived quintile were more likely to smoke than those living in less deprived quintiles. There was little decline apparent among those living in the most deprived neighbourhoods. Smoking rates for the most deprived neighbourhoods in London were lower than other regions.

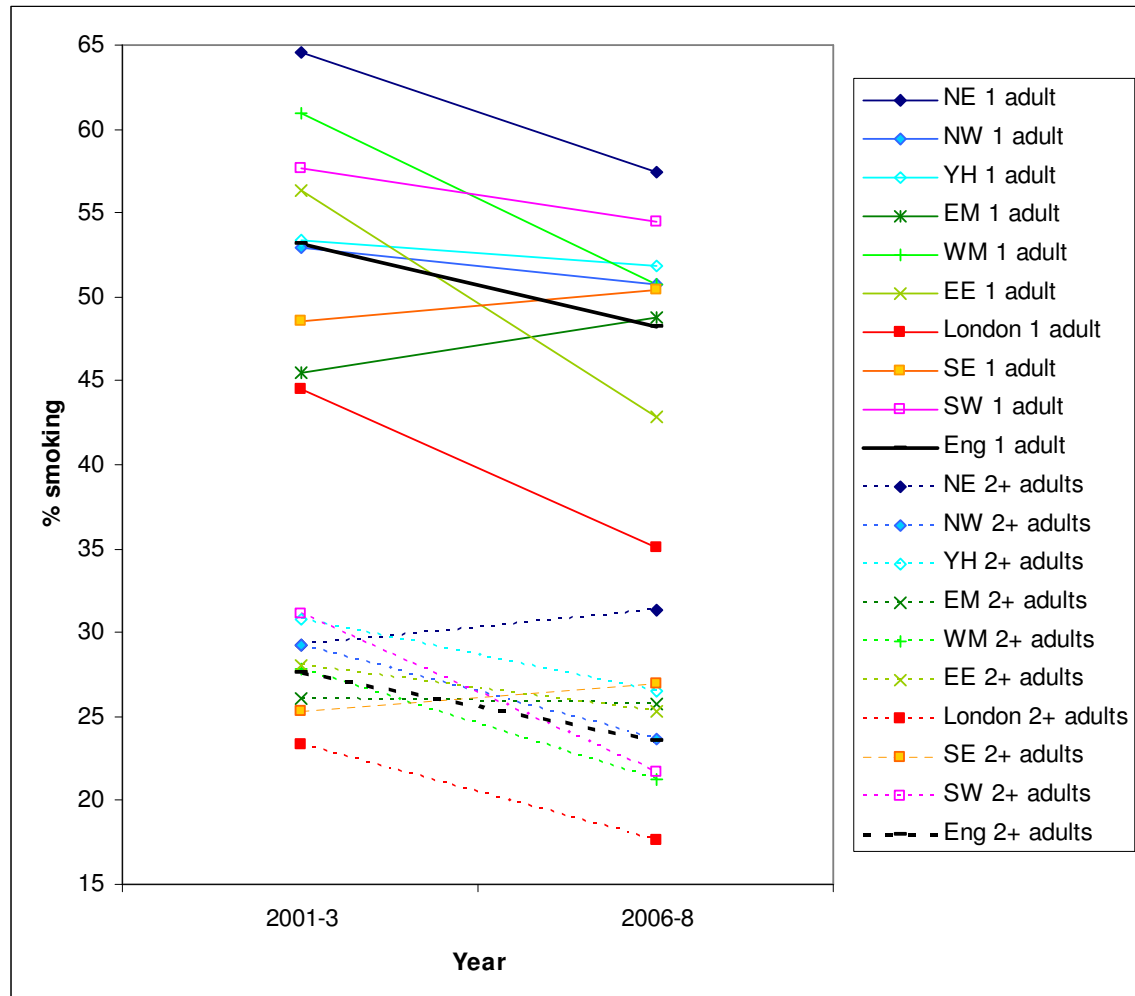
Figure 4 Smoking prevalence by year, regions and neighbourhood deprivation



3.2.2.4 Lone parent households

Only households with children are included in the figure. Smoking rates for lone parents (about 50%) were very high compared to other lower SES groups. Smoking rates for London were low, particularly in the later period and in the NE were high for all households with children. Smoking rates for lone parents were volatile due to small numbers and should not be over interpreted.

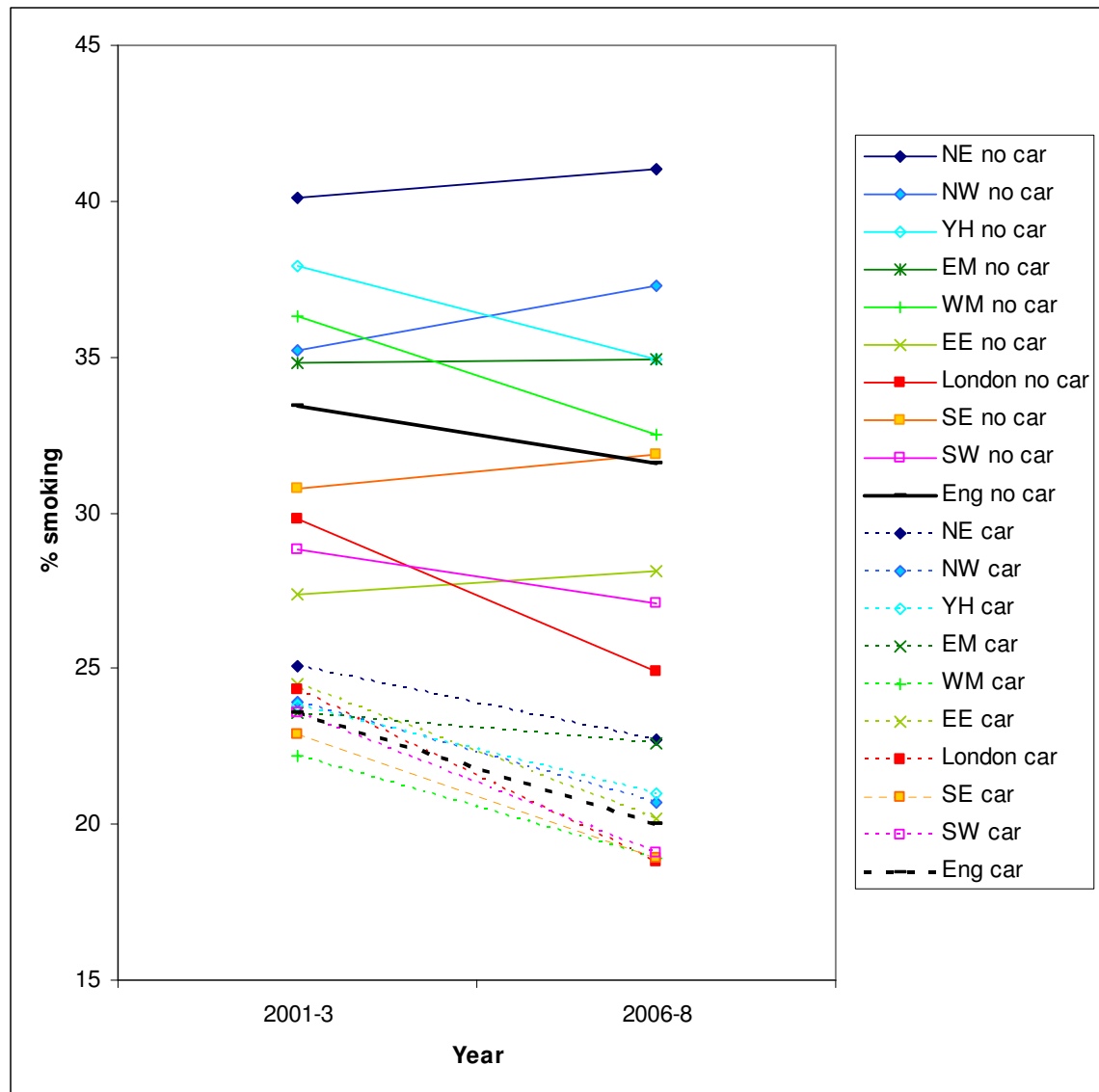
Figure 5 Smoking prevalence by year, regions and household with children with one or more adults



3.2.2.5 Availability of a car or van

The car access graph shows a clearer regional pattern with southern regions having lower smoking rates both amongst those with and without car access. There was a sharper decline in smoking amongst those with access to a car and those without cars in London.

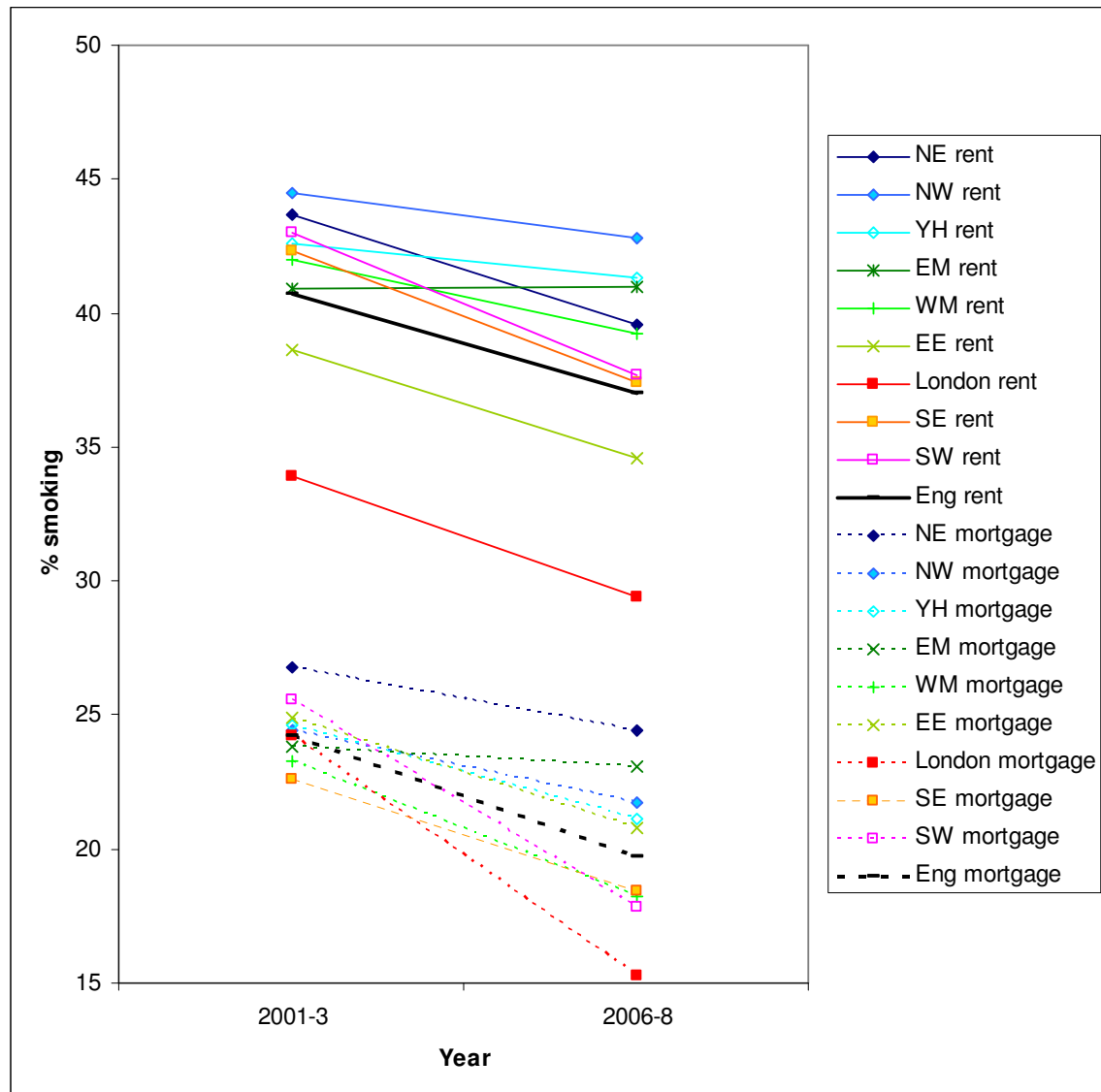
Figure 6 Smoking prevalence by year, regions and car/van availability



3.2.2.6 Housing tenure

There was a clear regional effect for those with mortgages and those renting particularly towards the end of the time period, smoking rates were higher in the northern regions than the southern regions. London rates were lower than other regions for renters and there was a particularly steep decline in smoking rates among London mortgagees. It appeared that smoking declined among both mortgagees and renters.

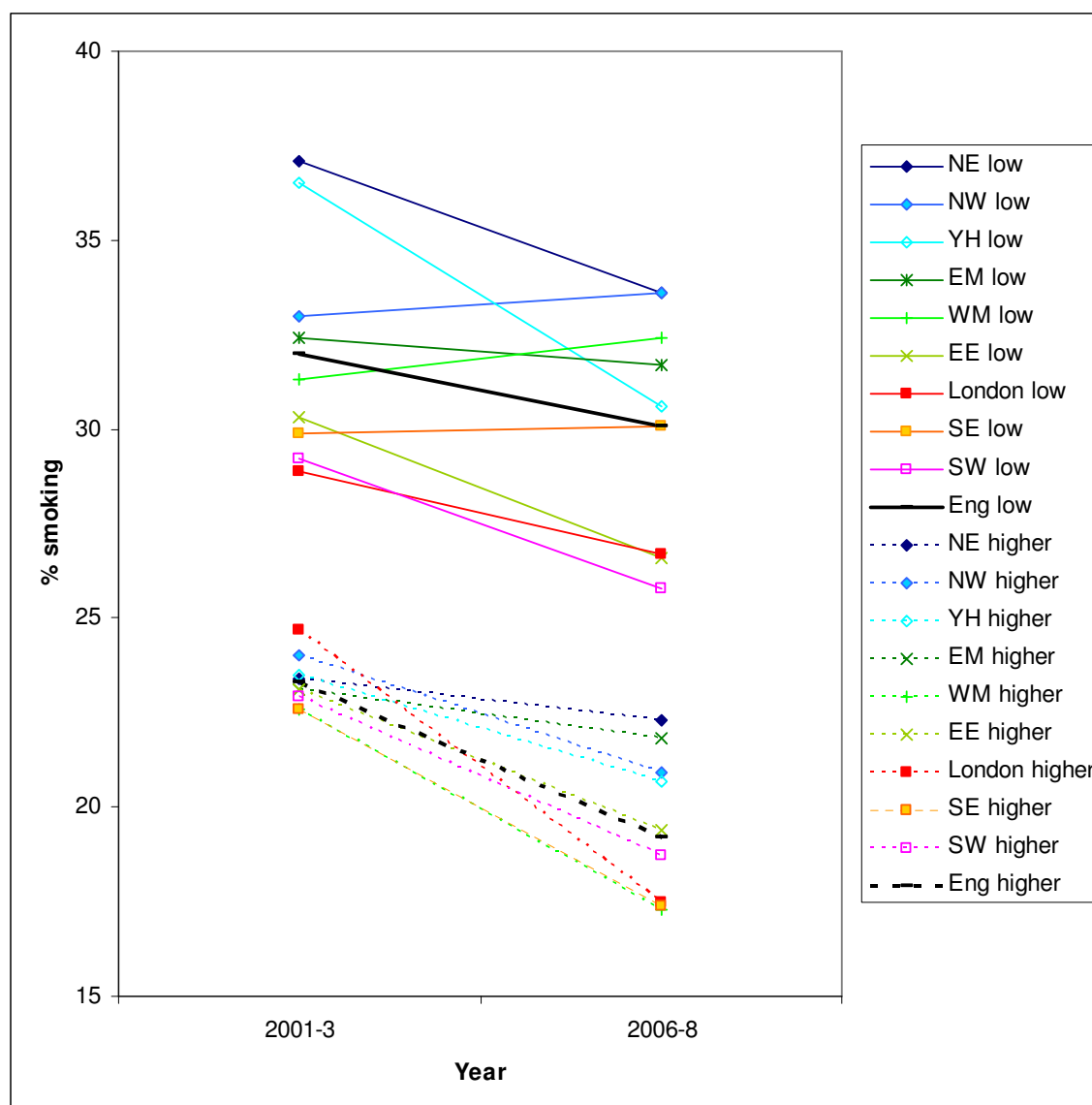
Figure 7 Smoking prevalence by year, regions and housing tenure



3.2.2.7 Household income tertile

Those in the lowest income tertile had higher smoking rates than other tertiles. Again there was a north/south regional effect particularly in the later time period and a steep decline among Londoners with higher incomes.

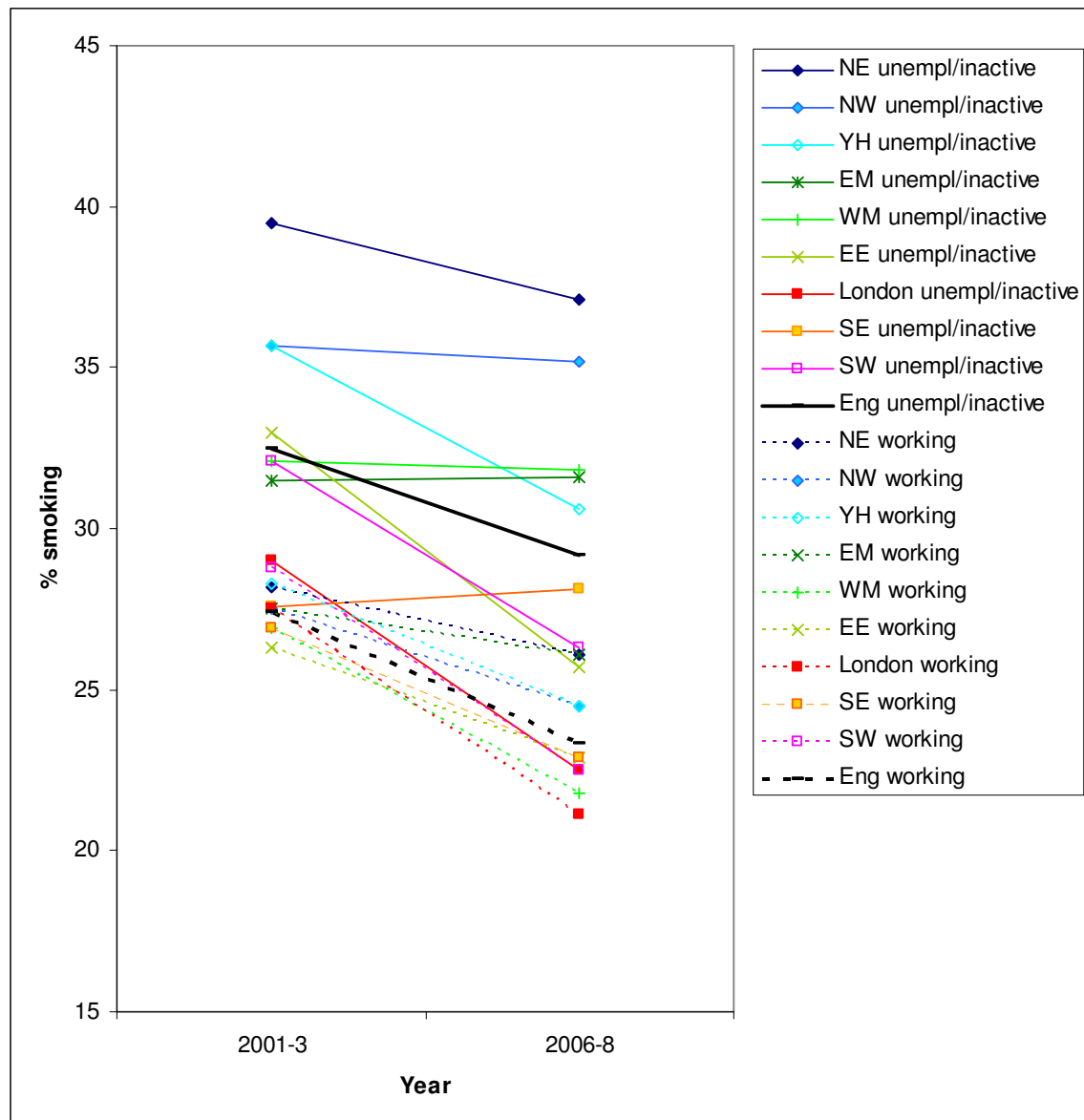
Figure 8 Smoking prevalence by year, regions and equivalised household income tertile



3.2.2.8 Economic status

Smoking rates among unemployed/inactive people were higher than those working for each region but the rates for unemployed/inactive people in the southern regions overlap with rates for working people in the northern regions. Rates were high in the NE but the difference between NE and other regions was reduced in the later time period.

Figure 9 Smoking prevalence by year, regions and economic status



3.2.2.9 Changes over time (HSE)

Confidence intervals were used to establish which regions had significantly lower or higher smoking rates than the English average and whether smoking rates dropped or rose significantly between the first three years (2001-3) and the final three years (2006-8) (Table 7).

Significant differences occur where it is certain enough that differences found in the sample would also be found in the population. In this analysis differences are said to be significant where 95% confidence intervals do not overlap which is equivalent to a p value of 0.05. This means that in 95% of samples taken from the population such a difference would be found. Differences are more likely to be significant where sample sizes are larger. Low SES groups were smaller than high SES groups so absolute percentages and changes over time were also examined.

Among low SES, NE had most significantly high smoking rates but significantly high rates also occurred in NW and EE. London had significantly lower smoking rates as did SE and SW. Only two regions' smoking rates significantly declined and this was only for one indicator. Among high SES again NE had significantly high rates and London had significantly low rates. Significant smoking rate declines were much more common, particularly in the southern regions. There were fewer significant declines for the lone parents indicator than other indicators.

A greater number of significant declines could be due to larger sample sizes among high SES than low SES so the size of the decline was also examined. An average smoking rate decline for low SES and high SES was calculated (Table 8) by summing the change over time for each indicator and then dividing by the number of indicators.

The biggest declines among low SES were in London and SW and the lowest were in NW and EM which showed a slight increase. Among high SES declines were largest in London and SW and lowest in NE and EM. Declines were larger among high SES than low SES for all regions except NE and YH where they were equal. The largest differences between the declines of low and high SES were NW and WM where smoking rates declined 3% further for high SES than low SES.

Among low SES there were only significant declines in London and SW. Among high SES there were significant declines in all regions except NE, YH and EM. There were most significant declines in London, WM and SW.

In the early period, NE low SES groups were significantly higher than the England average for 6 indicators. This reduced to 3 in the later period but in the later period there were significant differences for NE high SES groups for 3 indicators and the NW low SES groups for 3 indicators.

In the early period, London PM&I had significantly higher smoking rates than the English average. For two indicators both high and low SES Londoners had lower smoking rates than the English average. In the later period low SES Londoners were significantly lower than the English average for 5 indicators.

Table 7 Significant regional differences from England average 2001-3 and 2006-8 and significant changes over time for high and low SES groups

SES groups	NNSEC			RG Class			IMD			Lone parent			Car			Tenure			Income			Unemployment		
	01-03	06-08	Δ	01-03	06-08	Δ	01-03	06-08	Δ	01-03	06-08	Δ	01-03	06-08	Δ	01-03	06-08	Δ	01-03	06-08	Δ	01-03	06-08	Δ
<i>Low SES</i>																								
NE	↑	↑		↑						↑			↑	↑					↑			↑	↑	
NW														↑			↑					↑	↑	
YH																								
EM																								
WM																								
EE																								
London									↓	↑				↓			↓	↓					↓	↘
SE																						↓		
SW																								
England																			↘					↘
<i>High SES</i>																								
NE																								
NW																								
YH																								
EM																								
WM																								
EE																								
London	↑																							
SE																								
SW																								
England																								
01-03 Whether regional smoking rate was significantly different from England average in 2001-3																(p<.05)								
06-08 Whether regional smoking rate was significantly different from England average in 2006-8																(p<.05)								

Δ Whether significant change in regional smoking rates over time (2001-3 to 2006-8) ($p < .05$)

↑ = significantly more smokers than England average

↓ = significantly fewer smokers than England average

↘ = significant decline in smoking rates between 2001-3 and 2006-8

Table 8 Average changes in regional smoking rates by SES and the difference between high and low SES, summary of significant changes over time and regions with significantly higher or lower smoking rates than the English average by time period and low and high SES

Number of SES indicators showing significant (p<.05):												
Decline in % smoking 2001-3 to 2006-8			(a) declines in % smoking between 2001-3 and 2006- 8		(b) differences from England average 2001-3				(c) differences from England average 2006-8			
Low SES	High SES		Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES		
Difference					More smokers	Fewer smokers	More smokers	Fewer smokers	More smokers	Fewer smokers	More smokers	Fewer smokers
NE	2.8	1.3	-1.6		6				3		3	
NW	0.3	3.3	3.0	2					3			
YH	3.2	3.2	0.0									
EM	-0.9	1.2	2.1									
WM	1.7	4.9	3.3	6								
EE	3.3	3.9	0.6	3		1			1			
Lon	4.5	6.5	2.0	1	7	2	1	2		5		
SE	1.0	3.5	2.5	4		1						
SW	5.2	5.4	0.2	1	7					1		
Eng	2.6	3.9	1.3	2	8							

3.2.2.10 Summary

The main findings were:

- Low SES groups had higher smoking rates than high SES groups.
- Lone parents had particularly high smoking rates.
- Generally northern regions had higher smoking rates than southern regions. NE low SES had high smoking rates particularly in the early period.
- London appeared to have significantly low smoking rates and the gap increased over time.
- With the exception of EM low SES, overall smoking was declining in all regions and SES groups. Declines tended to be milder in low SES groups and were mostly not statistically significant.

3.2.3 The SES gradient - Count of low SES indicators (HSE)

In the previous section it was noted that there are many different indicators of SES. Although all provide a unique picture of the relationship between SES and smoking by region, common themes emerge. Thus one composite SES variable was devised encompassing all domains of SES in terms of occupation, neighbourhood, lone parents, transport, housing, income and unemployment. Similar scales have been used in work on SES and smoking cessation previously [172]. In this way we explore the relationship between a gradient of SES and smoking as recommended in the Marmot report [173]. In this section the scale development is described, the distribution of the scale and its relationship with smoking, region, changes over time and regional gender differences are included. In the latter part of the section the relative contribution of region as a predictor of smoking is explored.

3.2.3.1 Development of the scale

The indicators of SES (NSSEC, IMD quintile, lone parent household, car availability, housing tenure, income tertile and employment status) were merged using a count of indications of low SES. RG social class was not included as it measured occupational social class and thus was too similar to NSSEC. The low SES indicators that were counted were R&M occupation, most deprived quintile of neighbourhoods, lone parent households, no car or van available, renting accommodation, lowest income tertile and unemployed or economically inactive. No cases were excluded from the analysis for being missing or in a residual (or other) category so that the scale could be applied across the population. Some population groups were less likely to have low SES on some indicators; men and older people were less likely to be lone parents for example. The count ranged from 0 indicators of low SES to 7 indicators of low SES. Only 305 cases, however, had all indicators of low SES so these cases were merged with 6 indicators.

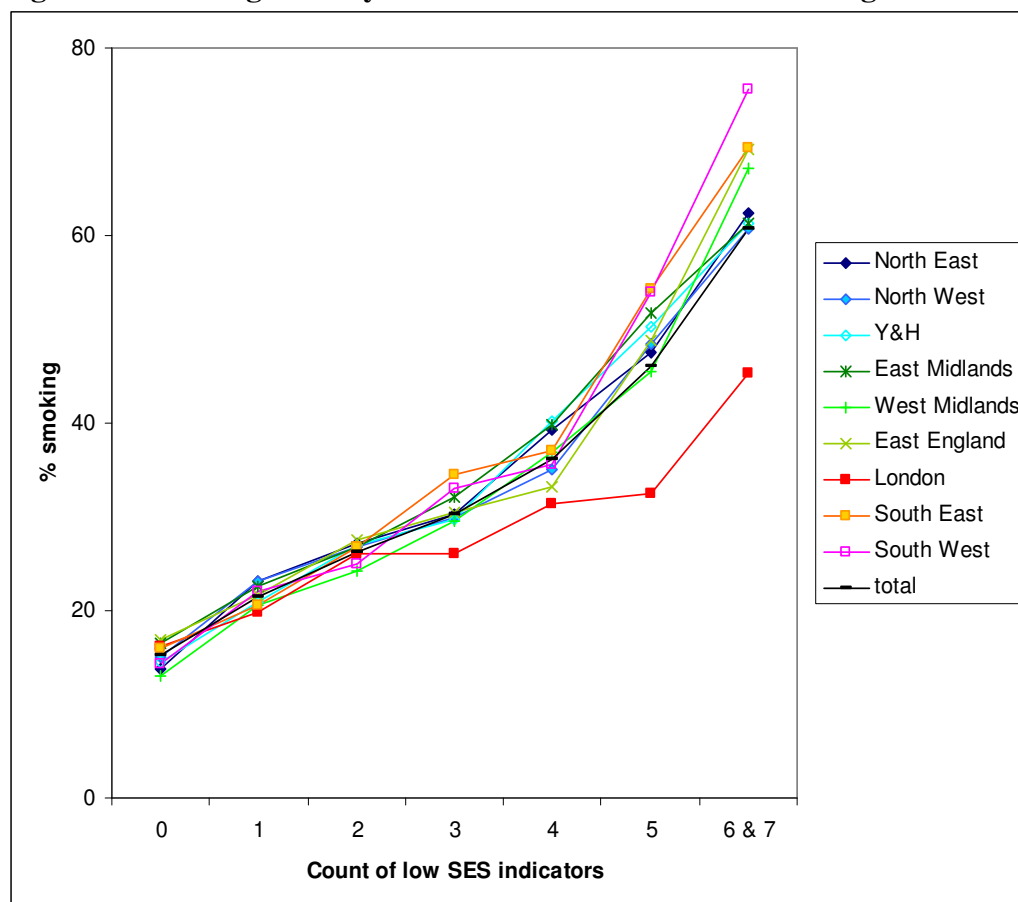
3.2.3.2 Count of low SES indicators distribution, smoking and regional smoking rates

The largest category (about a third of cases) had no indicators of low SES (Table 9). Over half the respondents had less than two indicators of low SES. The number of cases in each category reduces consecutively until less than 2% had 6 or 7 low SES indicators. There was a strong curvilinear association between count of low SES indicators and the smoking rate (Table 9). Only 15% of those with no indicators of low SES smoked whereas 60% of those with the most indicators of low SES smoked. For every indicator of low SES added, smoking increased by 5% up to 4 indicators. The difference between 4 and 5 indicators was an extra 10% smoking and the difference between 5 and 6/7 indicators was 15% smoking.

Table 9 Count of low SES indicators distribution and smoking rates (95% CI)

Number of indicators of low SES	N	%	% smoking
0	28956	32.4 (31.8 to 32.9)	15.3 (14.8 to 15.8)
1	23513	26.9 (26.5 to 27.3)	21.5 (20.8 to 22.1)
2	14594	16.7 (16.4 to 17.1)	26.3 (25.4 to 27.1)
3	9555	10.9 (10.6 to 11.2)	30.3 (29.2 to 31.4)
4	6307	7.2 (6.9 to 7.4)	36.1 (34.7 to 37.4)
5	3630	4.0 (3.8 to 4.3)	46.1 (44.2 to 48.0)
6/7	2567	1.9 (1.8 to 2.0)	60.7 (58.2 to 63.3)
Total	88337	100	24.0 (23.6 to 24.4)

When number of indicators of low SES was disaggregated by region (Figure 10) all regions except London showed a similar curvilinear relationship. There was little regional differentiation until there were several indicators of low SES at which point southern regions rates were slightly higher but not significantly so perhaps because of small numbers. London rates did not increase so rapidly with number of low SES indicators after 2 indicators of low SES and were significantly lower than other regions.

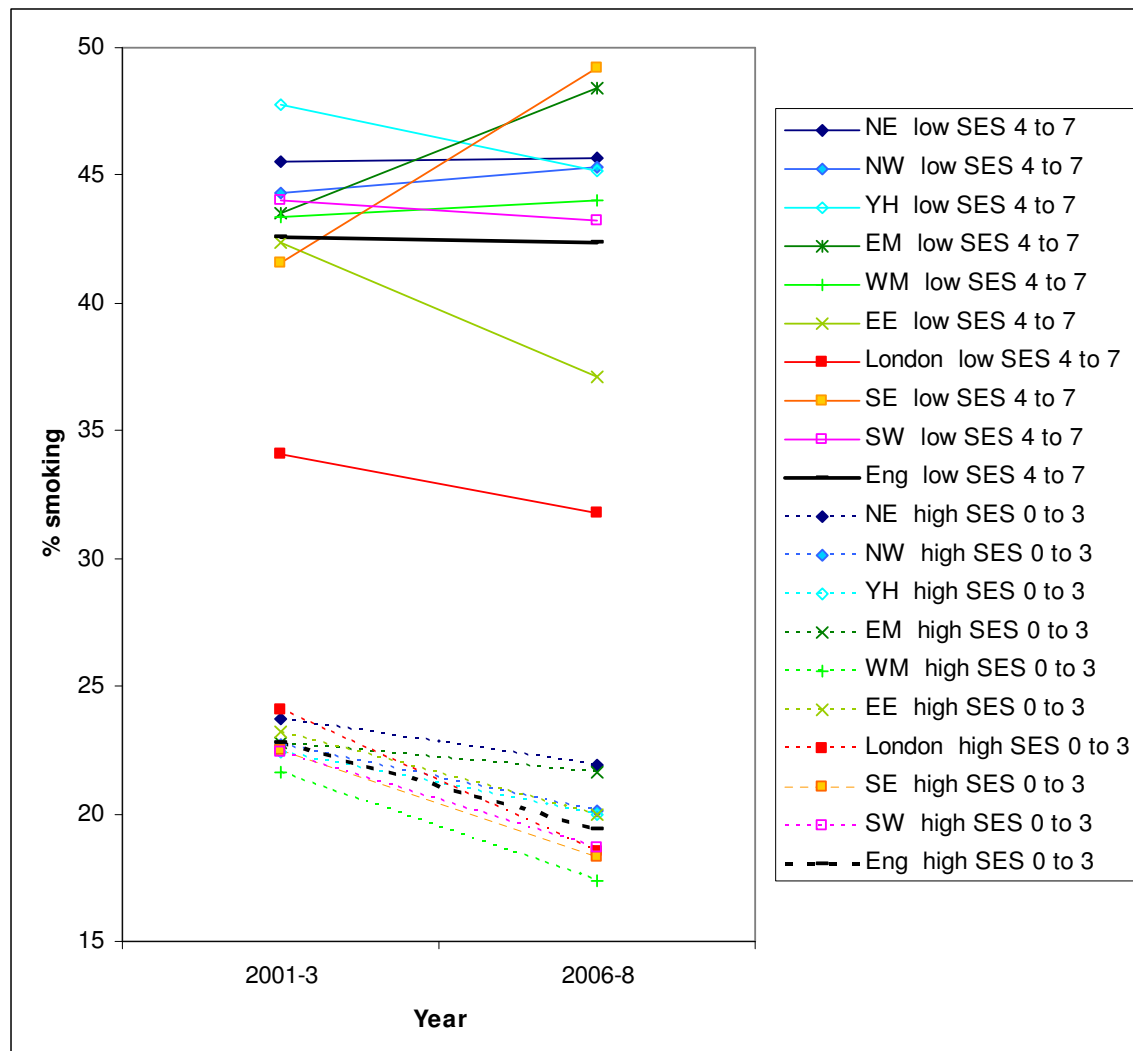
Figure 10 Smoking rates by count of low SES indicators and region

Confidence intervals and sample sizes presented in Appendix 3 table A3b

Thus an exploration of the gradient of SES and smoking suggests that the gradient in socioeconomic status corresponds to a gradient in smoking rates – however smoking rates are, with the exception of London, particularly high in the most disadvantaged groups. Given that the Marmot report found that a reduction of the gradient would be of primary importance in reducing health inequalities, this data suggests that a reduction in smoking rates of the most disadvantaged groups would do most to reduce the gradient between SES and inequalities.

The count of number of low SES indicators scale can be split into two categories: low SES with 4 to 7 indicators of low SES and high SES with 0 to 3 indicators of low SES (Figure 11). For those with 4 to 7 indicators there was negligible decline in smoking over the period studied. Among high SES there was a decline in smoking but this was less marked in NE and NW. Low SES Londoners had lower smoking rates but London rates did not stand out among those in the higher SES group.

Figure 11 Smoking rates over time by count of low SES indicators and region

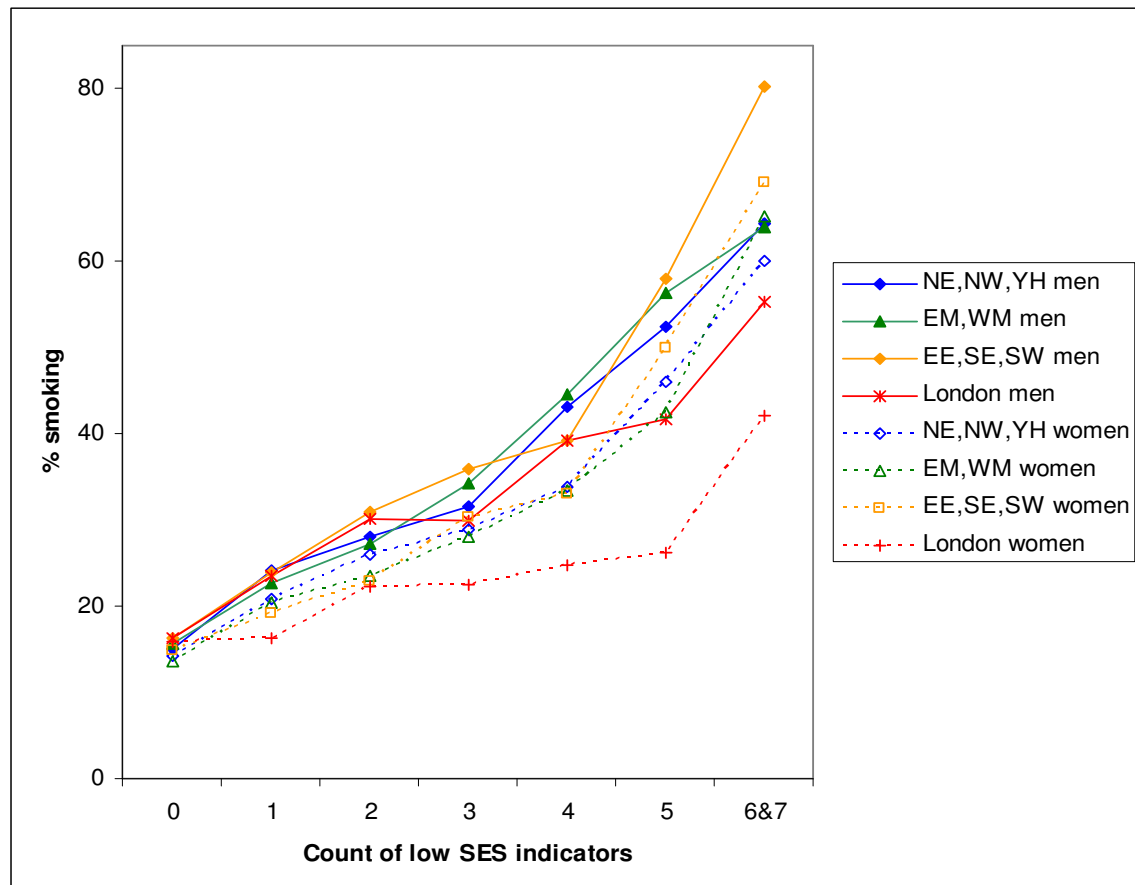


Confidence intervals and sample sizes presented in Appendix 3 tables A3a1 and A3a2

Sample sizes were insufficiently large to disaggregate by gender. If regions with similar smoking rates were grouped, however, the data could be disaggregated. The regional groupings were northern regions (NE, NW, YH), midlands regions (EM, WM), southern

regions (EE,SE,SW) and London (Figure 12). Smoking rates tended to be higher for men than women regardless of SES. Southern regions again appeared to have higher smoking rates for the lowest SES groups but small numbers meant the differences were not significant. Both men and women living in London had lower smoking rates but the difference was more marked for women.

Figure 12 Smoking rates by count of low SES indicators and grouped region and gender



Confidence intervals and sample sizes presented in Appendix 3 table A3c

3.2.3.3 The importance of SES and region in determining smoking rates in comparison with other factors

Two logistic regression analyses were completed comparing regional effects with other potential factors that may be associated with smoking prevalence. Separate models were performed for two time periods: 2001-3 (the earliest years) and 2006-8 (the latest years). In the first analysis the following odds ratios were calculated: region, age, gender and SES. Significant regional differences were found thus further exploration was necessary. In the second analysis there were separate models for men and women and odds ratios of regional groupings were compared with age, SES and ethnicity. Confidence intervals of odds ratios show a significant relationship between the variable of interest and the outcome when they do not cross 1.00.

In the first analysis (85) the following odds ratios were calculated: age, gender, SES and region. The odds ratios provided showed the change for one year of age. The odds ratio (chance) of men smoking was compared to that of women. Those with no indicators of

low SES were compared with those who had one or more indicators. The NE, the region with the highest smoking rate, was compared with each other region.

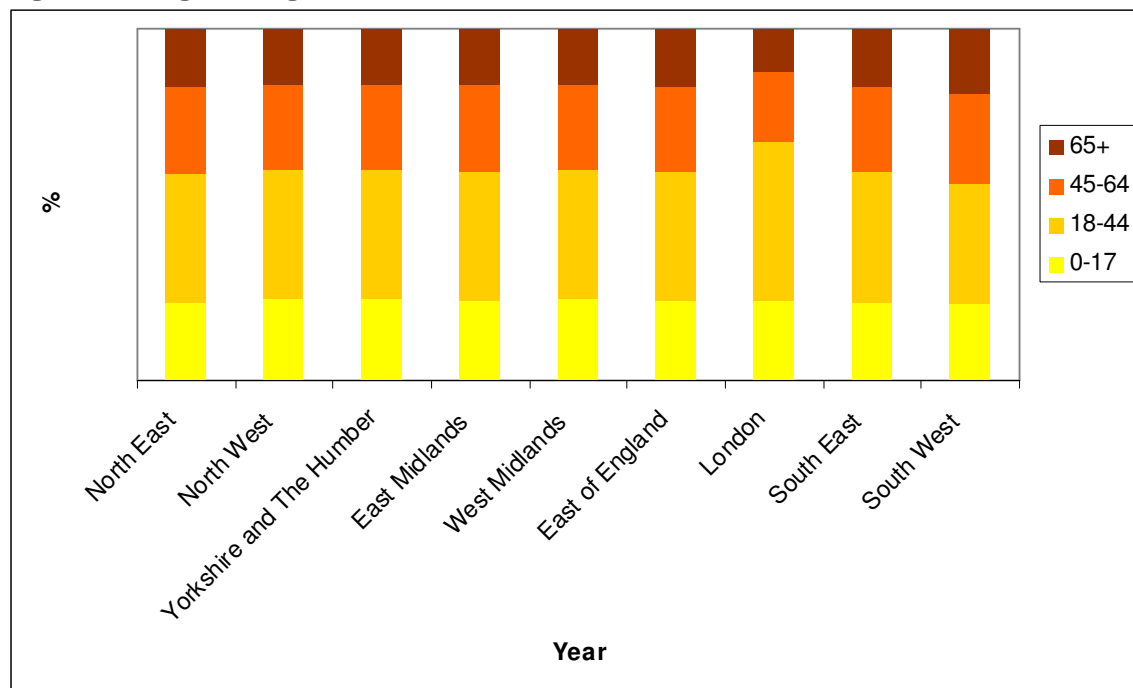
Table 10 Multivariate models of current smoking

Period	Model 1	N	Model 2	N
	2001-3		2006-8	
	OR (95%CI)		OR (95%CI)	
<i>Age (years)</i>	0.978 (0.976 to 0.979)		0.983 (0.981 to 0.984)	
<i>Gender</i>				
women	1	20891	1	19850
men	1.18 (1.12 to 1.23)	16780	1.32 (1.25 to 1.39)	16025
<i>SES</i>				
0	1	11572	1	12296
1	1.44 (1.33 to 1.56)	10128	1.54 (1.41 to 1.67)	9543
2	1.91 (1.76 to 2.08)	6374	2.13 (1.94 to 2.35)	5897
3	2.34 (2.13 to 2.57)	4167	2.81 (2.53 to 3.14)	3746
4	2.98 (2.67 to 3.33)	2901	3.62 (3.21 to 4.07)	2396
5	4.16 (3.65 to 4.75)	1704	5.49 (4.74 to 6.37)	1340
6 /7	6.71 (5.65 to 7.96)	825	9.09 (7.48 to 11.04)	657
<i>Region</i>				
NE	1	2335	1	2120
NW	0.98 (0.87 to 1.10)	5262	1.00 (0.86 to 1.17)	5238
YH	0.98 (0.85 to 1.12)	3825	0.97 (0.82 to 1.15)	3820
EM	0.99 (0.86 to 1.13)	3582	1.12 (0.95 to 1.32)	3469
WM	0.93 (0.81 to 1.06)	4073	0.86 (0.72 to 1.02)	3750
EE	1.06 (0.93 to 1.22)	4379	0.98 (0.83 to 1.16)	4079
Lon	0.85 (0.74 to 0.97)	4532	0.70 (0.59 to 0.84)	3984
SE	1.05 (0.93 to 1.19)	5811	0.98 (0.82 to 1.16)	4412
SW	1.04 (0.91 to 1.19)	3872	0.98 (0.83 to 1.15)	5003

Age was strongly significant for all models. Men were significantly more likely to smoke than women. The odds ratio for men was larger in the later time period although the odds ratios are not directly comparable as they are from different models. Those with 6/7 indicators of low SES were nearly 7 times more likely to smoke than those with no indicators in the early period and 9 times more likely to smoke in the later period.

When age, gender and SES were taken into account the only region that was significantly different was London in the early time period. This pattern was repeated for the later years except that the chance of smoking in WM was almost significantly lower than NE. Lower rates in London were not explained by age which was not surprising given that London has the highest proportion of younger adults (aged 18-44) and so would be expected to have higher smoking rates rather than the lower smoking rates found (Figure 13).

Figure 13 Regional age distribution (2001 census)



Underlying data presented in Appendix 3 table A3d

London smoking rates were significantly lower than other regions and WM smoking rates were close to significantly lower. Low SES London women (Figure 12) had particularly low rates which suggest there may be an ethnic explanation for the 'London effect'. In the 2001 census 28% of Londoners were of non-white ethnic group as were 12% of residents of WM. The other regions varied between 2% and 6%. Thus further modelling ethnicity needed to be considered.

As it appears that gender was associated with smoking rates and smoking has different meanings for low SES women [174] further modelling was necessary to look at whether gender impacted on regional differences in addition to ethnicity. In this second analysis there were two models of each gender and time period: a base model including age, gender and region; and a model additionally adding ethnicity and count of low SES indicators. Sample sizes were insufficient to calculate odds ratios for each region separately for men and women, so regions were grouped. The northern regions were compared with the other regional groupings and whites were compared with ethnic minorities (mixed, Asian, black and other/unknown).

Among men in the early period (Table 11) there were lower smoking rates in the southern regions than the northern regions. After taking SES and ethnicity into account men living in London and the other southern regions were *more* likely to smoke than those in the northern regions. This was not found in the model for the later time period.

In the later period men resident in London and southern regions were less likely to smoke than those in the northern regions. The lower smoking rate in London disappeared once ethnicity and SES were into account.

Table 11 OR (95% CI) of smoking by grouped region taking into account age, count of low SES indicators and ethnicity

	Men		Women	
	2001-3	2006-8	2001-3	2006-8
<i>Controlling for age</i>				
NW,NE,YH	1	1	1	1
	0.94 (0.84 to	0.94 (0.84 to	0.86 (0.78 to	0.90 (0.81 to
EM,WM	1.06)	1.06)	0.96)	1.01)
	0.91 (0.82 to	0.85 (0.76 to	0.85 (0.77 to	0.78 (0.71 to
EE,SE,SW	1.00)	0.94)	0.92)	0.86)
	1.00 (0.88 to	0.83 (0.71 to	0.76 (0.67 to	0.65 (0.55 to
London	1.14)	0.97)	0.86)	0.75)
<i>Controlling for age, SES and ethnicity</i>				
NW,NE,YH	1	1	1	1
	1.05 (0.94 to	1.01 (0.90 to	0.96 (0.87 to	1.00 (0.91 to
EM,WM	1.17)	1.14)	1.06)	1.11)
	1.15 (1.04 to	1.04 (0.93 to	1.02 (0.93 to	0.94 (0.85 to
EE,SE,SW	1.26)	1.16)	1.11)	1.04)
	1.15 (1.01 to	0.95 (0.80 to	1.00 (0.88 to	0.92 (0.78 to
London	1.31)	1.12)	1.14)	1.08)

Further details presented in Appendix 3 tables A3e1 A3e2 and A3e3

Women were less likely to smoke in the early period if they did not live in the northern regions. Again the lower rate in London disappeared when ethnicity was controlled for and the lower rate in the other regions disappeared when SES was taken into account (see tables A4e1 and A4e2 in Appendix 4 for more detailed analysis). In the later period the smoking rate was lower in London and the southern regions than northern regions. The confidence interval just crossed 1.00 for the midlands regions. After ethnicity and SES were introduced there were no significant effects for any of the regional groupings.

Logistic regression analysis suggested a strong relationship between the number of indicators of low SES and the chances of smoking. North-South regional differences were explained by SES and London's low smoking rates were the results of a higher proportion of ethnic minorities.

3.2.3.4 Summary

The main findings were:

- As SES decreased cigarette smoking increased exponentially. Less than 2% possessed the highest number of indicators of low SES but more than 60% of these smoked and these high rates showed negligible change over time.
- Smoking rates were lower among women and among Londoners. They were markedly lower among women from London.
- North-South regional differences could be explained by SES and lower smoking rates in London appeared to be the result of a higher proportion of ethnic minorities.

3.2.4 Smoking prevalence (GHS and HSE comparison)

Thus far only HSE data has been used. To test the validity of HSE data, HSE results were compared with similar analyses using the GHS. Unfortunately sample design information

is not released for the GHS which severely limits its usefulness as it is not possible to accurately calculate confidence intervals. Furthermore there is a longitudinal element so not all cases are independent and the management of proxy interview cases was not consistent for all years.

Cigarette smoking rates were calculated using GHS data (2001 to 2003 and 2006 to 2008) (see Appendix 3 table A3f) and compared with HSE data. IMD is not attached to the GHS so rates could not be compared. Smoking rates by SES indicator and region are presented graphically. Then summary tables show the average change in smoking rates for low and high SES groups by indicator of SES and region.

When household NSSEC (Figures 14a and 14b) in the HSE and GHS were compared, both surveys showed higher R&M smoking rates in all regions compared with PM&I. Both showed a decline in smoking among PM&I. The HSE, however, showed little if any decline in R&M smoking rates whereas GHS did show a decline. NE stood out as having particularly high R&M smoking rates in the HSE but not the GHS whereas London R&M appeared to have lower rates in the GHS compared to other regions but not in the HSE.

Semi and unskilled workers, as categorised by Registrar General's social class (Figures 15a and 15b) in the NE had particularly high smoking rates in the HSE whereas all three northern regions stood out in the GHS.

Both the GHS and HSE (Figures 16a and 16b) showed much higher rates of smoking among lone parent households than other low SES groups. Both showed low smoking rates among parents in London. The lone parent rates were particularly volatile in both surveys due to small numbers. However volatility was minimised by comparison of 2001-3 and 2006-8 only.

For car availability (Figures 17a and 17b) both showed higher smoking rates among those without access to a car or van and both showed lower smoking rates in London. Both showed more decline in smoking rates among those with car availability than those without.

Lower smoking rates in London were also prominent in both the GHS and HSE for housing tenure, particularly for renters (Figures 18a and 18b). Both showed much higher smoking rates among renters.

There was a much greater decline for those in the lowest income tertile (Figures 19a and 19b) in the GHS than the HSE. The north/south regional difference was clearer in the HSE than the GHS.

Both graphs of economic status (Figures 20a and 20b) showed low smoking rates in London and high smoking rates in the NE among those who were unemployed/inactive.

GHS and HSE changes over time for each SES indicator, the count of indicators and overall are summarised in Table 12. Between 2001-3 and 2006-8 the HSE smoking rate dropped by 1.7% for R&M workers and 4.1% for PM&I workers. GHS smoking rates dropped by 3.8% and 4.5% respectively. The difference between the HSE decline for R&M and PM&I was 2.4% whereas the GHS difference was only 0.7%.

Table 12 Change in smoking rates 2001-3 to 2006-8 for each low and high groups of each indicator, count of indicators and overall for England

	HSE			GHS		
	Low SES	High SES	Difference	Low SES	High SES	Difference
NSSEC	1.7	4.1	2.4	3.8	4.5	0.7
RG social class	2.5	3.6	1.1	2.9	5.1	2.3
IMD	1.2	3.3	2.1			
Lone parent	5.0	4.1	-0.9	8.9	5.1	-3.7
Car	1.8	3.6	1.8	2.1	5.0	2.9
Tenure	3.7	4.5	0.8	3.3	5.2	1.9
Income	1.9	4.1	2.2	4.8	5.1	0.3
Unemployment	3.3	4.1	0.8	3.3	5.6	2.3
Count of low SES indicators	0.2	3.4	3.2			
Average	2.5	4.0	1.5	3.4	5.1	1.7

(see also Appendix 3 table A3g)

There was a decline in the smoking rate for all indicators in both surveys. For all indicators, except lone parents, the smoking rate declined more for high SES than low SES. In the HSE, for low SES, the highest declines were for lone parents and renters and the lowest declines were for those living in the most deprived areas whereas for the GHS the highest declines were for lone parents and low income. Among high SES groups in the HSE smoking rates declined most for owners and least for those living in affluent areas whereas in the GHS smoking rates declined most among workers and least among PM&I workers. The difference between low and high SES groups was greatest for NSSEC in the HSE and for car availability in the GHS.

Averages for all SES indicators were calculated by summing the declines and dividing by the number of indicators. Lone parents were not included because of particularly volatile changes in the GHS. The IMD and count of indicators were not included in the HSE total because they did not have a GHS equivalent.

The average decline for low SES groups was 2.5% in the HSE and 3.4% in the GHS and the average decline for high SES groups was 3.4% in the HSE and 5.1% in the GHS. Thus for both low and high SES groups the decline in the GHS was about 1% greater in the GHS than the HSE. Overall there was a similar difference between low and high SES groups in both surveys: smoking rates declined by 1.5% less for low SES than high SES in the HSE and 1.7% less for low SES than high SES in the GHS.

Overall GHS and HSE changes over time for each region and England are summarised in Table 13. In the NE low SES groups declined 2.7% in the HSE and 1.0% in the GHS and high SES groups declined 1.8% in the HSE and 7.4% in the GHS. Thus in the HSE the smoking rate declined more among R&M groups whereas in the GHS the smoking rate declined more among PM&I. Smoking rates did not decline for the following low SES groups: NW and EM in the HSE and SW in the GHS.

Table 13 Change in smoking rates 2001-3 to 2006-8 for each region

	HSE			GHS		
	Low SES	High SES	Difference	Low SES	High SES	Difference
NE	2.7	1.8	-1.0	1.0	7.4	6.5
NW	-0.4	3.2	3.6	2.5	5.6	3.1
YH	3.9	3.1	-0.9	1.0	3.8	2.9
EM	-0.2	1.4	1.5	6.2	5.6	-0.5
WM	0.8	4.6	3.8	0.9	3.3	2.4
EE	3.5	4.0	0.5	7.4	6.4	-1.0
Lon	3.9	6.8	2.9	4.9	6.4	1.5
SE	0.9	4.4	3.6	5.5	4.9	-0.6
SW	5.0	5.0	-0.1	-1.2	2.6	3.8
Eng	2.5	4.0	1.5	3.4	5.1	1.7

(see also Appendix 3 table A3h)

There was little agreement between the surveys in the magnitude of the change in smoking rate or the difference between low SES and high SES groups. Both surveys suggest that the smoking rate declined more among low SES than high SES in NW, WM and London but they disagreed for the other regions.

In conclusion the HSE and GHS results were broadly comparable: low SES groups had higher smoking rates and low SES in London mostly had lower smoking rates than other regions. For all SES indicators, except lone parents, there was a slightly steeper decline in smoking rates among high SES. Both surveys agreed that there was a greater decline in smoking rates among high SES than low SES in NW, WM and London

There were some differences: smoking declined by about 1% more in the GHS than the HSE. The magnitude of declines in smoking varied between the surveys for indicators of SES and regions. Regional directions of the change in smoking rates varied among low SES groups and whether low SES or high SES had experienced greater decline varied for six of the nine regions. NE stands out as having higher smoking rates in the HSE but not in the GHS.

3.2.4.1 Summary

The main findings were:

- Both GHS and HSE found
 - higher smoking rates among low than high SES groups
 - a slightly greater decline in smoking among high SES groups than low SES groups (except for lone parents).
 - Lower smoking rates in London
- Inconsistencies in
 - other individual regional rates and
 - changes over time.
- Note that GHS analysis is less than robust due to data changes over the time period analysed.

Figure 14a Percentage smoking by Household NSSEC & region -HSE

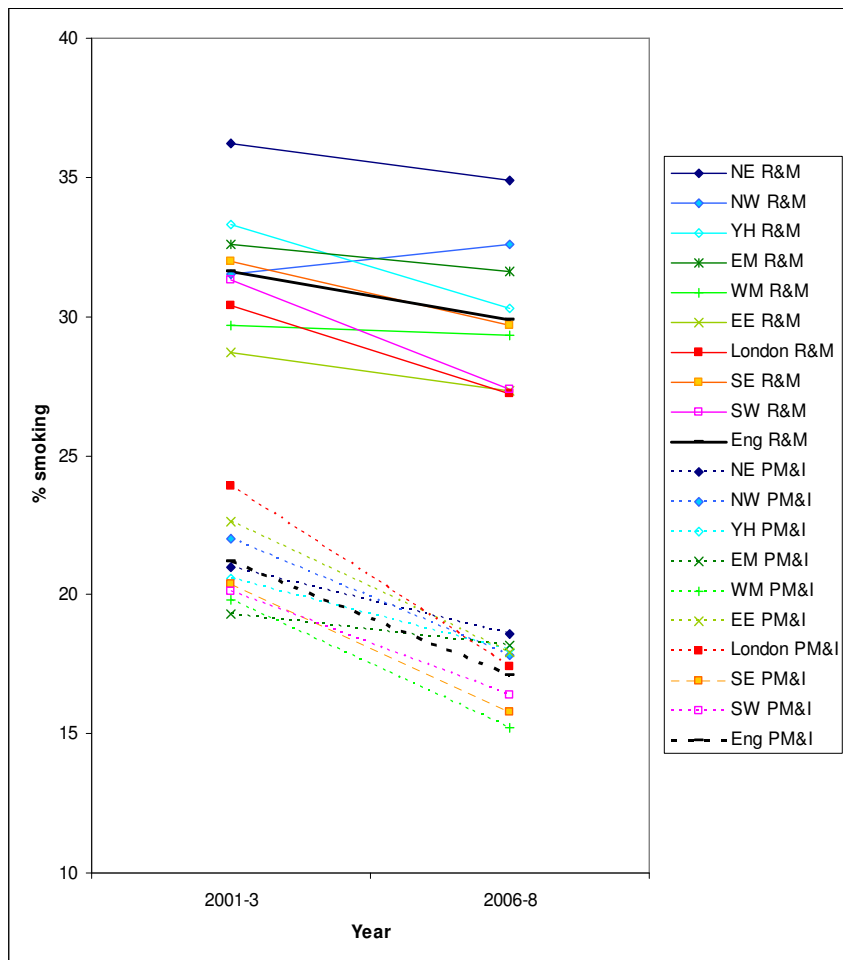


Figure 14b Percentage smoking by Household NSSEC & region -GHS

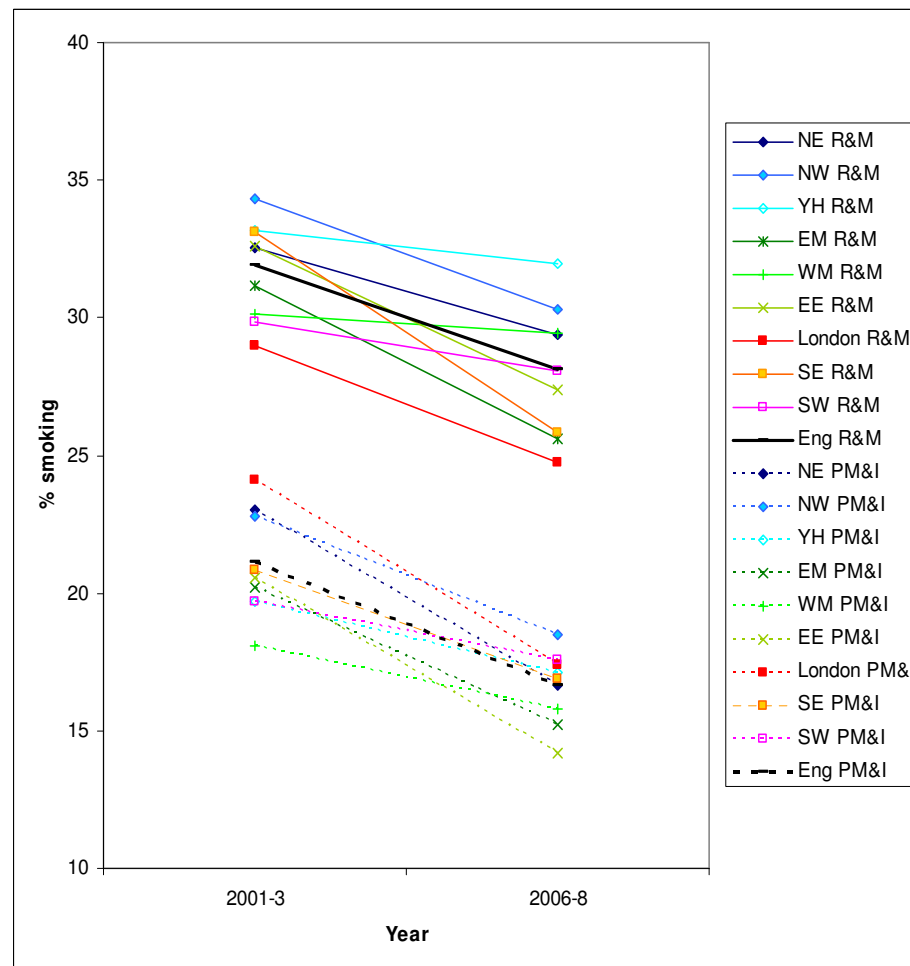


Figure 15a Percentage smoking by RG Social class & region - HSE

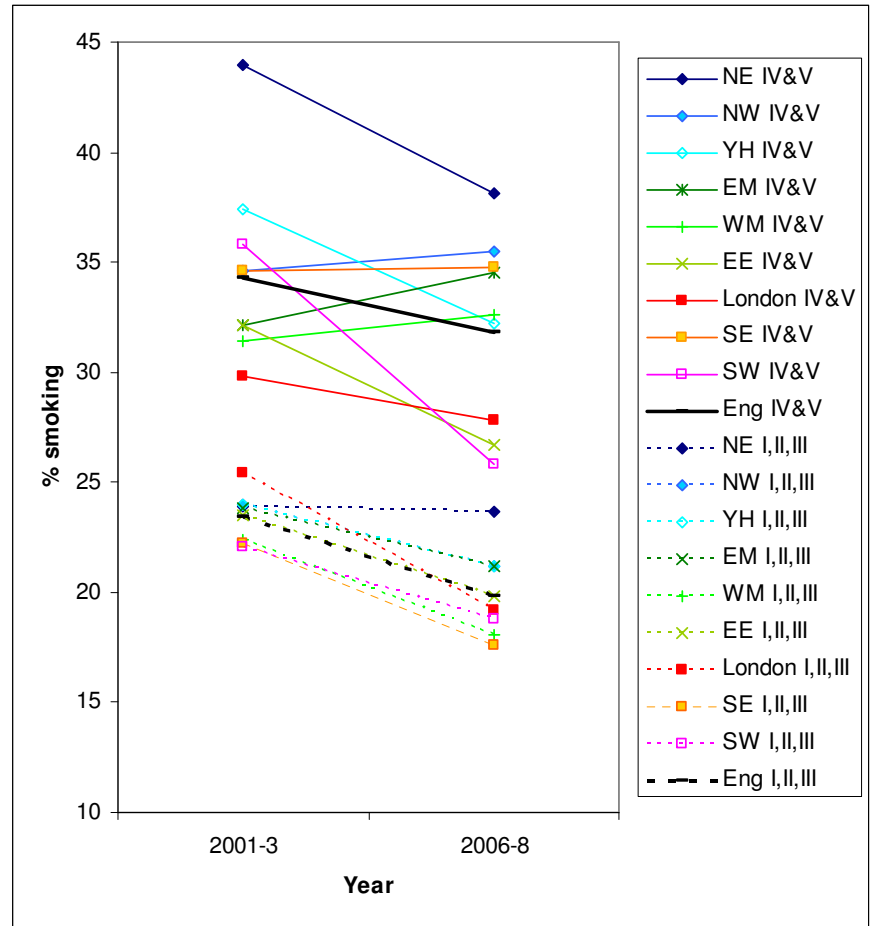


Figure 15b Percentage smoking by RG Social class & region - GHS

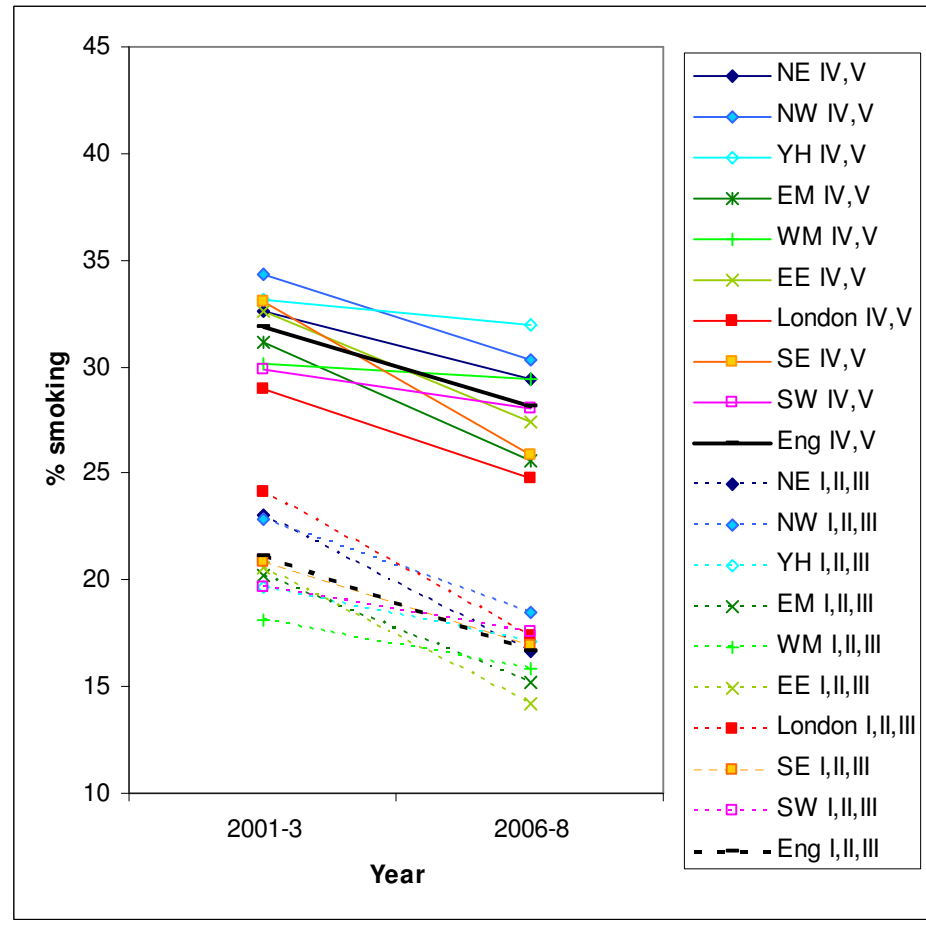


Figure 16a Percentage smoking by households with children & region -HSE

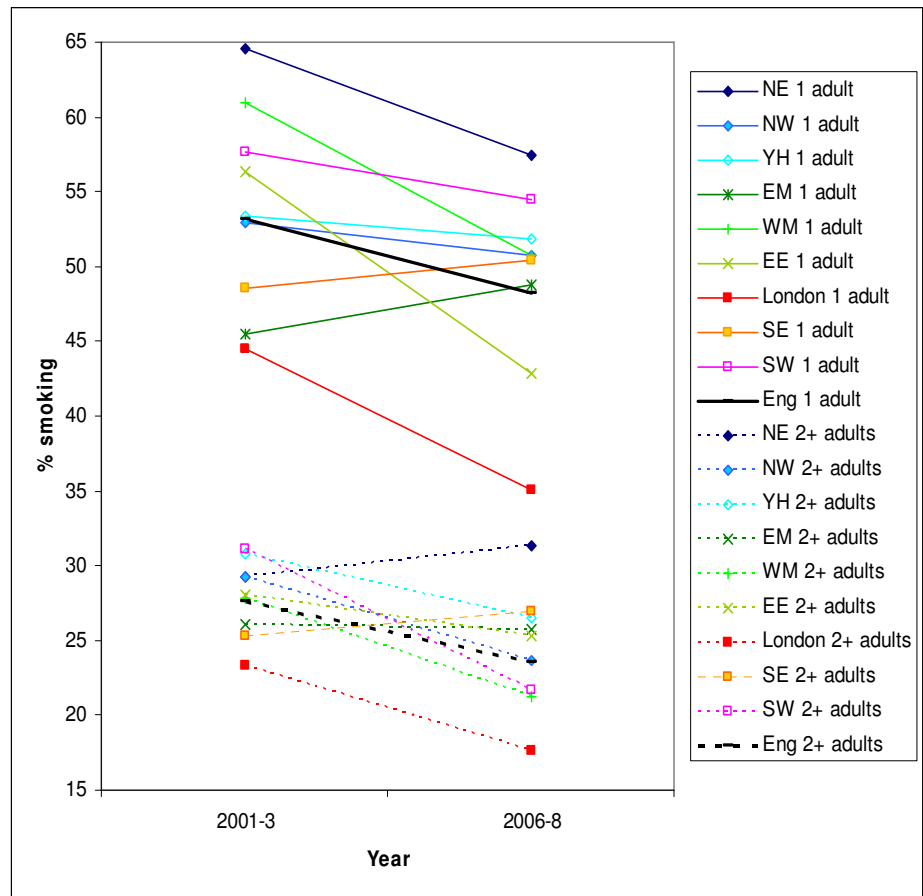


Figure 16b Percentage smoking by households with children & region -GHS

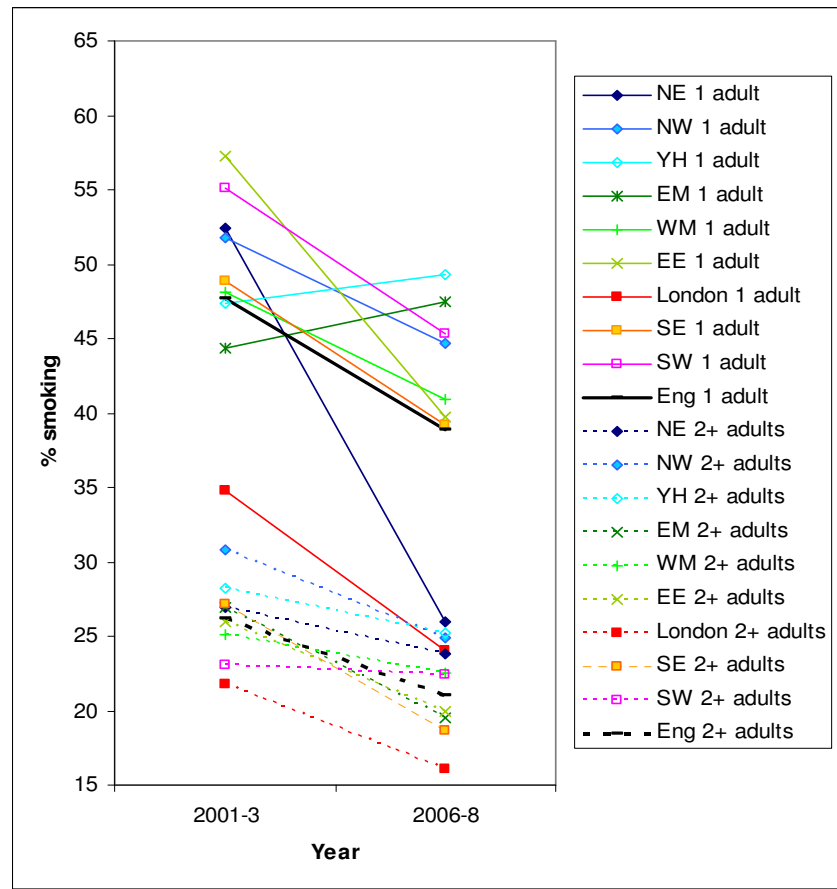


Figure 17a Percentage smoking by car availability & region - HSE

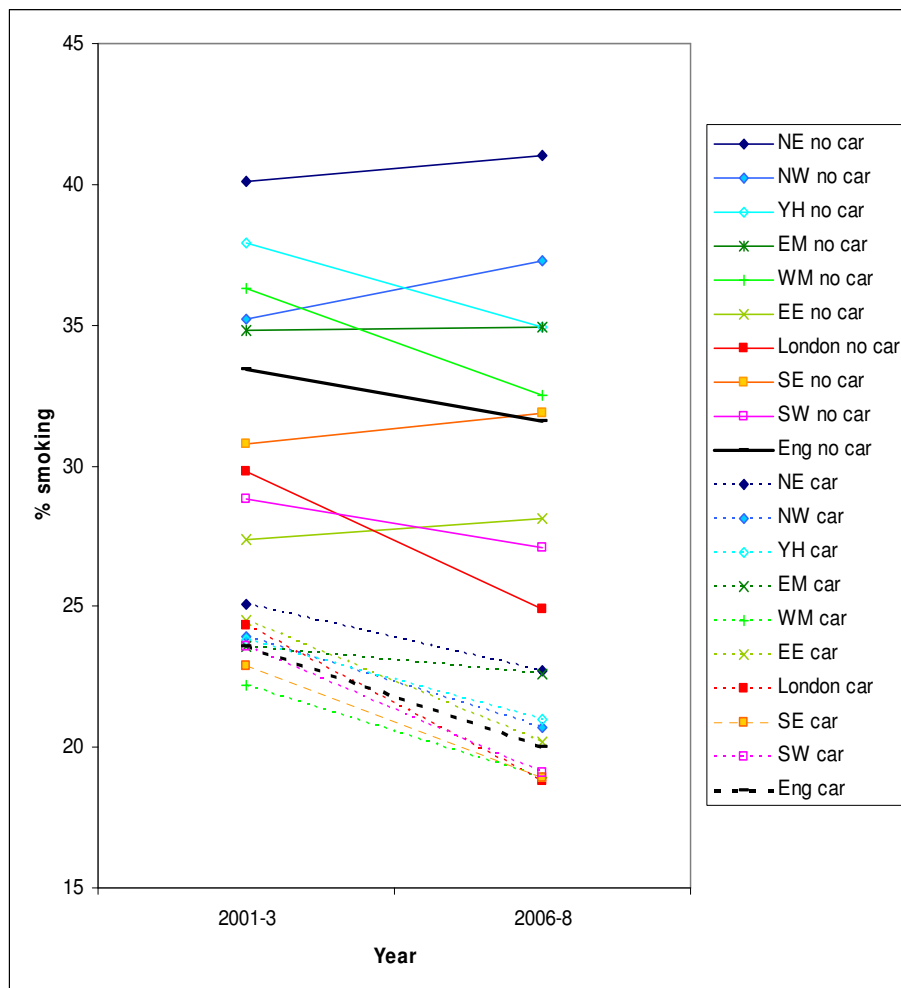


Figure 17b Percentage smoking by car availability & region - GHS

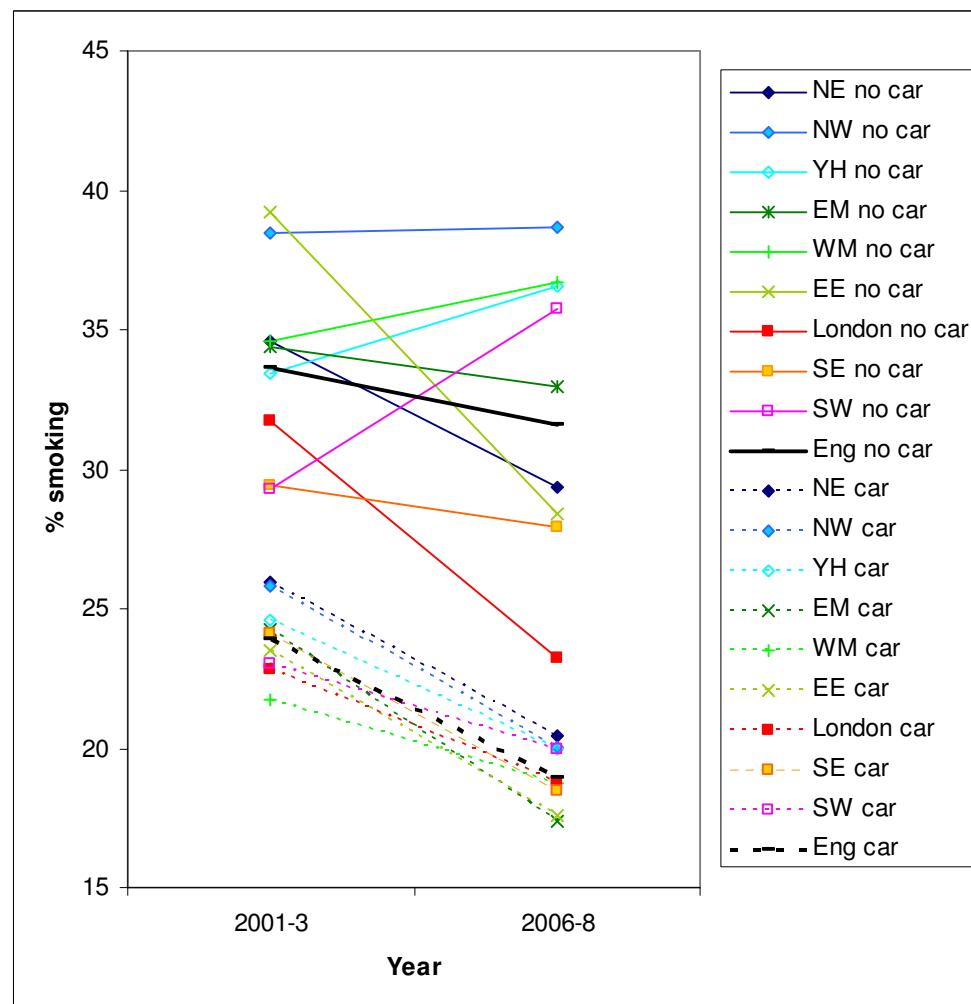


Figure 18a Percentage smoking by tenure & region -HSE

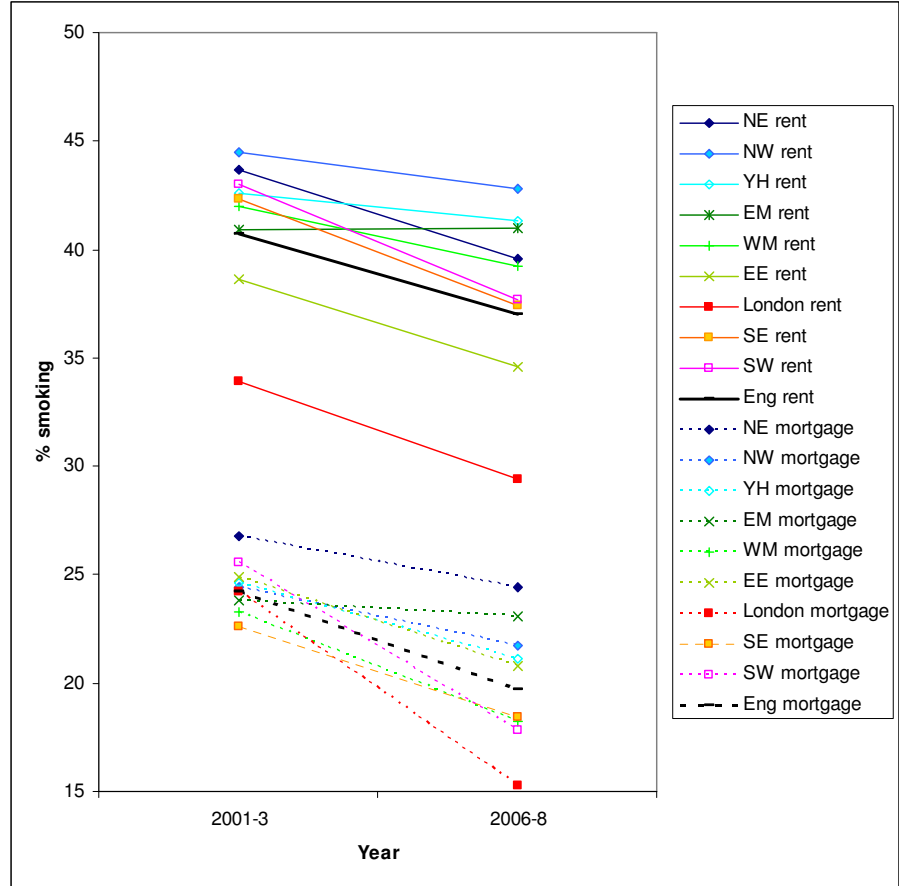


Figure 18b Percentage smoking by tenure & region -GHS

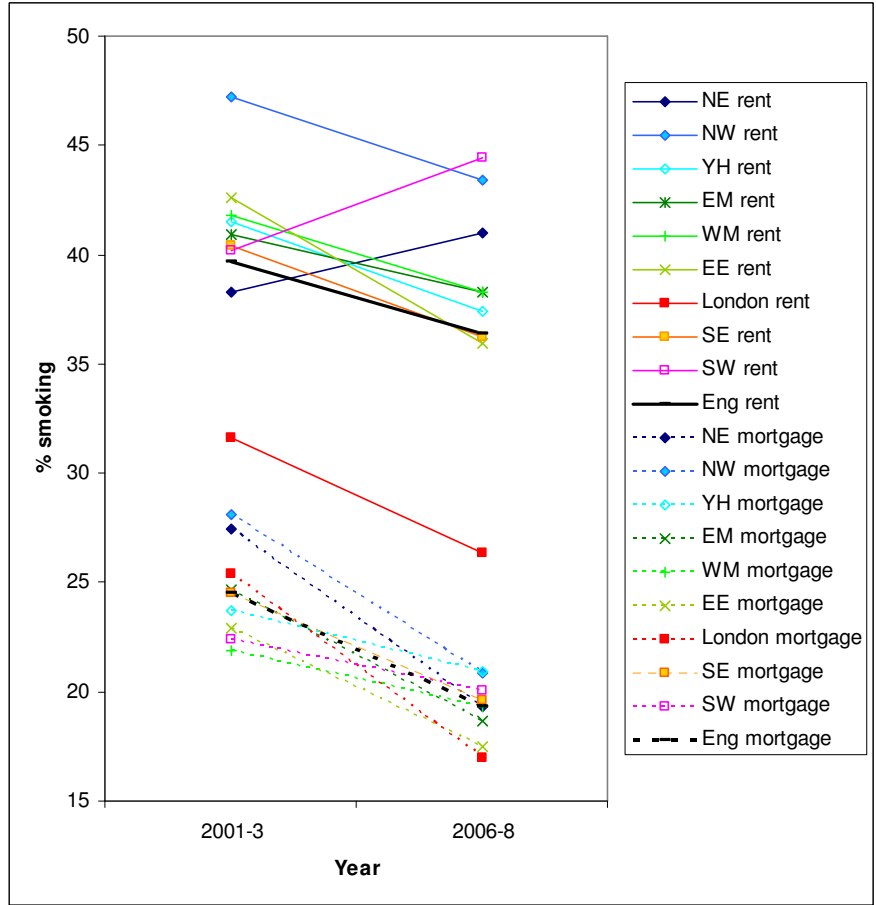


Figure 19a Percentage smoking by household income & region -
HSE

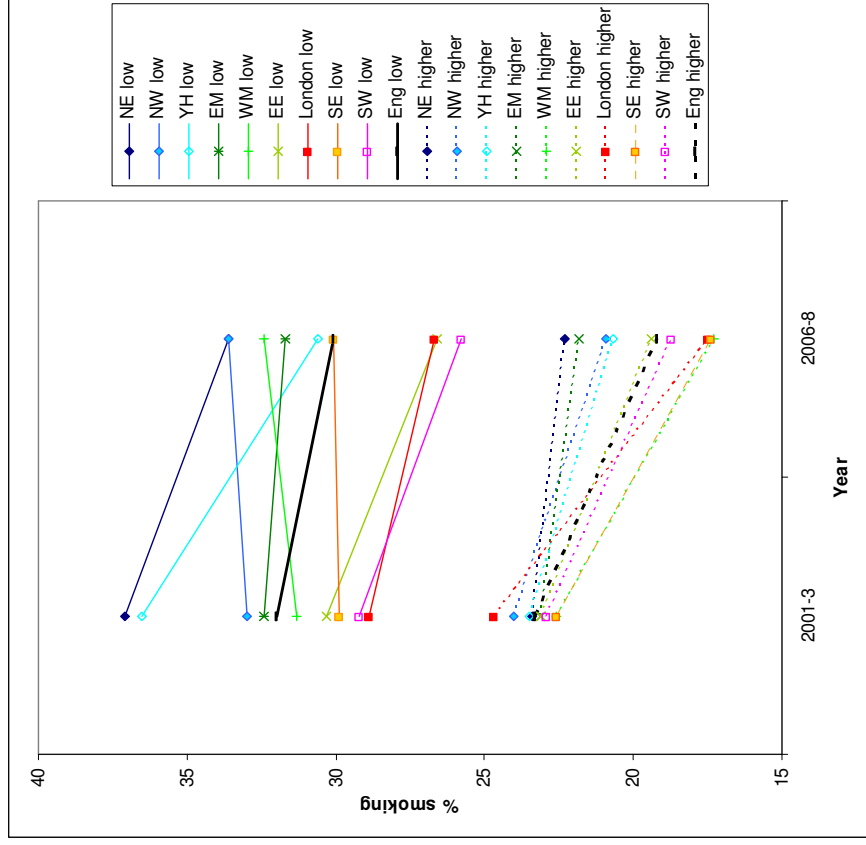


Figure 19b Percentage smoking by household income & region -
GHS

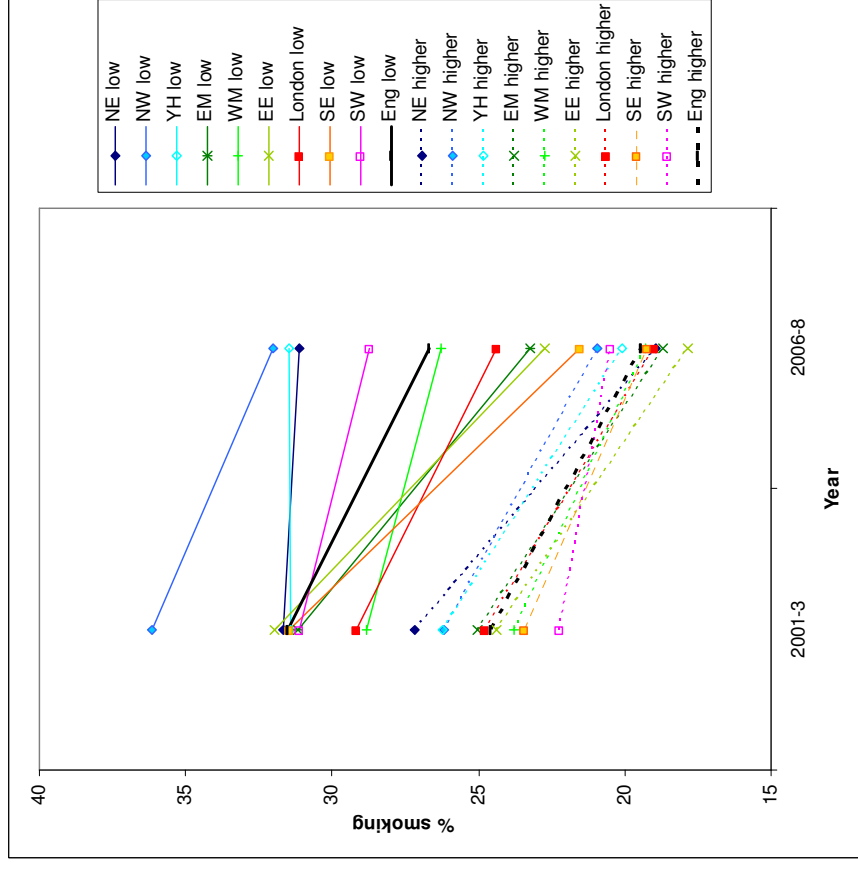


Figure 20a Percentage smoking by economic status & region - HSE

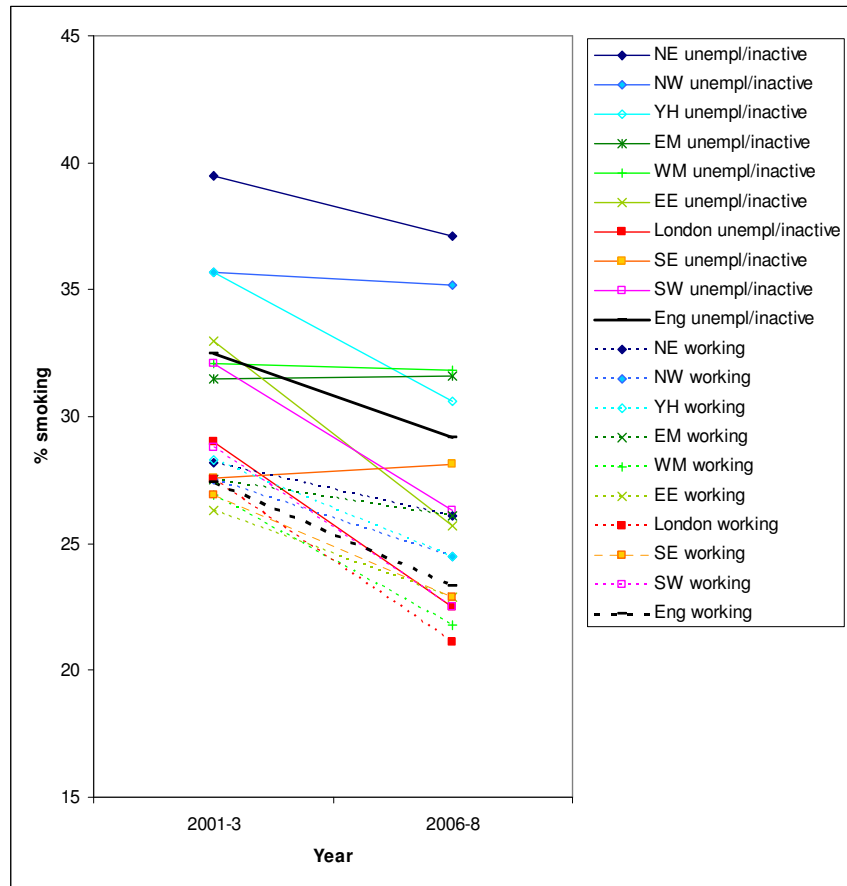
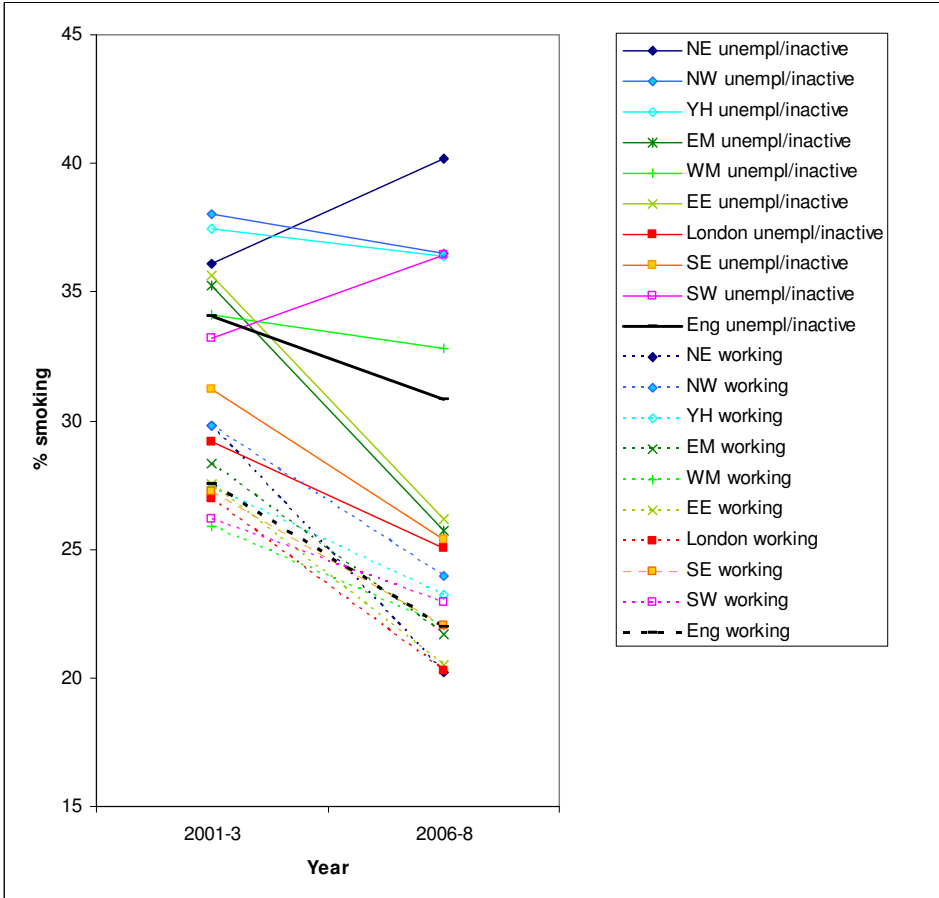


Figure 20b Percentage smoking by economic status & region - GHS



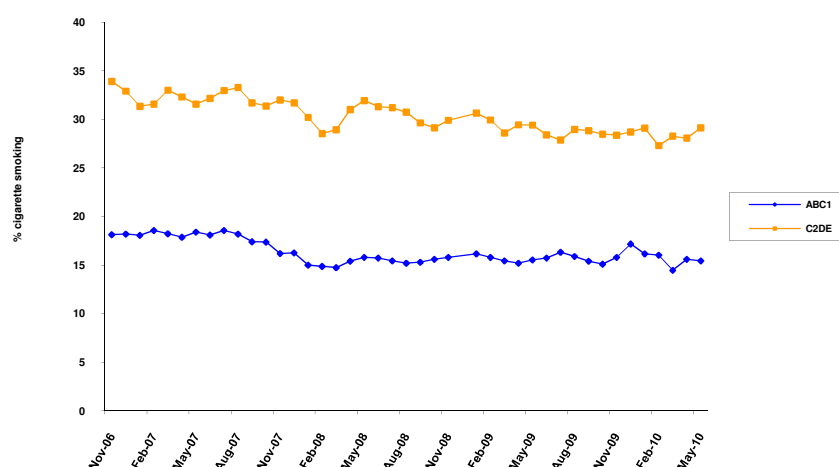
3.2.5 Smoking Prevalence 2007-2009 (STS)

The ONS survey data was only available at the time of analysis up to 2008. The STS has data collected from 2006-2010 so far. Thus STS data was included to further validate HSE results and extend the analysis by providing more recent data. The indicator of SES provided is social grade (AB, C1, C2, D, E) of the respondent. NSSEC was available for a short period but was experimental only and should not be used for analysis. The STS analysis was weighted but not adjusted for sample clustering. Analysis taking into account the clustered design would be likely to produce wider confidence intervals.

Social grade is based on purchasing power rather than skills like RG social class or employment relations as with NSSEC [175]. It is somewhat similar to RG social class in that non manual occupations are classified A, B or C1 whereas C2 and D are manual workers. Class E includes casual workers and those with long term dependence on the state so all respondents are included in the classification. For the purposes of this paper social grade was split in the traditional way: A,B,C1 are compared with C2,D,E.

Smoking appeared to be higher amongst the low SES group (C2DE) (Figure 20). Cigarette smoking prevalence for ABC1 (about 18%) and C2DE (about 32%) in 2007 were very similar to GHS and HSE NSSEC PM&I and R&M prevalence in 2006-8 (Table 14 and Figure 13). There was a decline in both low and high SES groups but the high SES group appeared to plateau after 2007 (Figure 21).

Figure 21 Percentage cigarette smoking by social grade and month of survey (3 month smoothed)



For the regional analysis (Table 14) data are presented from the three years in which full year data are available (2007-2009). The regional boundaries are again Government Office Regions. Smoking rates were lower in 2009 than 2007 overall and both for low and high SES. Although the drop was slightly smaller for low SES their decline

continued steadily whereas for the high SES group there was a drop between 2007 and 2008 but no further decline between 2008 and 2009.

Table 14 Percentage of cigarette smokers (95 % CI)* by social grade, year and region (STS)

	Total		AB, C1 High SES		C2, D, E Low SES	
	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N
<i>Total</i>	22.6 (22.3-22.9)	14758	16.4 (16.0-16.8)	4754	30.5 (30.0-31.0)	10004
<i>Year</i>						
2007	24.2 (23.6-24.7)	5624	17.9 (17.3-18.6)	1840	31.9 (31.0-32.8)	3784
2008	22.0 (21.4-22.6)	4385	15.3 (14.6-16.0)	1353	30.4 (29.4-31.4)	3032
2009	21.5 (21.0-22.1)	4749	15.7 (15.1-16.4)	1561	29.1 (28.1-30.0)	3188
<i>Region</i>						
NE	24.4 (23.0-26.0)	980	16.2 (14.4-17.9)	280	34.1 (31.7-36.6)	700
NW	25.4 (24.5-26.4)	2135	18.8 (17.7-20.0)	652	32.8 (31.4-34.3)	1483
YH	26.1 (25.0-27.2)	1665	18.1 (16.7-19.5)	441	33.7 (32.1-35.3)	1224
EM	23.6 (22.5-24.8)	1174	16.3 (14.9-17.6)	338	32.2 (30.4-34.1)	836
WM	25.1 (24.0-26.1)	1727	16.8 (15.5-18.1)	457	33.5 (31.9-35.1)	1270
EE	21.6 (20.7-22.5)	1741	15.7 (14.7-16.8)	586	29.6 (28.0-31.2)	1155
Lon	18.0 (17.3-18.8)	2073	14.6 (13.7-15.5)	797	23.1 (21.7-24.4)	1276
SE	21.4 (20.6-22.2)	2144	16.2 (15.2-17.1)	824	30.2 (28.7-31.7)	1320
SW	20.8 (19.8-21.8)	1119	15.3 (14.1-16.5)	379	28.0 (26.3-29.7)	740
<i>Grouped region</i>						
NE,NW,YH	25.5 (24.8-26.1)	4780	18.1 (17.3-18.9)	1373	33.4 (32.4-34.4)	3407
WM,EM	24.4 (26.7-25.2)	2901	16.6 (15.6-17.5)	795	33.0 (31.7-34.2)	2106
EE,SE, SW	21.3 (20.8-21.8)	5004	15.8 (15.2-16.4)	1789	29.3 (28.4-30.3)	3215
Lon	18.0 (7.3-18.8)	2073	14.6 (13.7-15.5)	797	23.1 (21.7-24.4)	1276

* Data are weighted but not adjusted for sample clustering

NE, NW, YH and WM&EM had higher levels of smoking than EE&SW and particularly London. North/south differences by region were much more apparent among low than high SES groups.

The patterns shown are thus similar to those found in the HSE. The 2009 STS data raises the possibility that the previous decline in cigarette smoking recorded in the HSE, GHS and STS may have plateaued particularly among high SES.

In summary, STS data, like the HSE and GHS, shows higher smoking rates among low SES and, particularly among low SES, higher rates in northern regions. There was some evidence, from the most recent data, that the decline in smoking may be tailing off.

3.2.6 Summary- what do the HSE, GHS and STS data tell us about smoking prevalence?

- All data sources agreed that:
 - low SES groups had higher smoking rates than high SES groups.
 - northern regions generally had higher smoking rates than southern regions.
 - London appeared to have significantly low smoking rates and the gap between London and other regions increased over time.
- Both HSE and GHS data (2001-8) agreed that:
 - lone parents had particularly high smoking rates
 - there was a slightly greater decline in smoking among high SES groups than low SES groups (except for lone parents)
- Individual regional rates and changes over time were not consistent except for lower rates in London
- HSE data suggested that:
 - there was a curvilinear relationship between the number of indicators of low SES and smoking rates.
 - the most disadvantaged:
 - made up less than 2% of the population
 - had markedly high smoking rates (60%)
 - showed negligible change in smoking rates over time.
 - North-South regional differences could be explained by SES
 - lower smoking rates in London appeared to be the result of a higher proportion of ethnic minorities.
- STS data (2007-9) suggested that the decline in smoking may be tailing off.

3.3 Cigarette consumption by SES and region

So far it has been established that there were regional differences in smoking rates but these can be explained SES and ethnicity. There may also be regional differences in consumption. These are explored in HSE and STS data. Smoking consumption was operationalised in these datasets as 'light' (<10 cigarettes per day), 'moderate' (10-19 cigarettes per day) and 'heavy' (20+ cigarettes per day).

3.3.1 Cigarette consumption (HSE)

The HSE consistently includes data on consumption. Consumption was measured by number of cigarettes smoked per day.

3.3.1.1 Cigarette consumption (HSE) - Methodology

To measure cigarette consumption the HSE asks cigarette smokers how many cigarettes they smoke on weekdays and weekends. Percentages of light, heavy and moderate cigarette smoking by region and count of low SES indicators (divided into two categories 'high SES' 0 to 3 indicators and 'low SES' 4 to 7 indicators) for 2001- 2003 and 2006-2008 were calculated. Three year averages were used to reduce data noise. Using confidence intervals, significant regional differences compared to the English average and significant changes over time were noted for low and high SES groups.

Logistic regression analysis was used to determine whether there were north/south regional effects and a 'London effect' once other factors were taken into account. The outcome variables were firstly heavy smoking compared with other smokers and non-smokers combined and secondly light smokers compared with other smokers and non-smokers combined. Regions were grouped into northern (NE, NW,YH), midlands (EM, WM), southern (EE,SE,SW) and London. Separate regression analyses were performed for each gender and each time period providing four models. These models had two stages: firstly age and regional grouping were entered and secondly count of SES indicators and ethnicity were added.

3.3.1.2 Regional cigarette consumption rates (HSE)

Light, moderate and heavy smoking rates were calculated for low and high SES groups in each region (Figure 22 and Table 15, underlying data presented Appendix 3 tables A3a1 and A3a2). Light smoking rates were about 3% higher among low SES (11%) than high SES (7%). Regional smoking rates clustered around the England average. There were no significant differences from the England average among low SES. High SES Londoners had significantly higher light smoking rates.

There was very little change over time in light smoking with one exception. There was a significant 6.5% increase in SE low SES light smoking rates. The light smoking rates among SE high SES declined slightly (by 0.5%) meaning the difference in changes over time for SE low and high SES was 7%.

Moderate smoking rates were just under 18% among low SES and about 8% for high SES. Low SES Londoners had significantly lower moderate smoking rates than England overall. High SES residents of NE had significantly higher smoking rates than the England average.

There were no significant changes in moderate smoking rates over time among low SES. However it is worth noting that SE moderate smoking rates increased by 5.8% which was nearly as much as the significant 6.5% increase in light smoking. Other notable changes which did not reach significance were a 2.5% increase in moderate smoking in SW and a 5.1% decline in EE. Among high SES there was a small but significant decline in moderate smoking overall (1.1%) and in London (2.2%). In England overall there was 0.7% more of a decline in moderate smoking among high compared to low SES.

Heavy smoking rates were about 14% among low SES. London rates were significantly lower than the England average. There were no significant differences from the England average among high SES. In 2001-3 the English rate was nearly 7% but this had declined to under 4% by 2006-8.

Heavy smoking declined in all regions and all SES groups, except EM low SES, however there were no significant declines among low SES. There were substantial but non significant declines in SE and SW. There were significant declines among high SES in NW, EM, London, SE, SW and overall. In England overall there was 1.2% more of a decline in heavy smoking among high compared to low SES.

Moderate smoking was the most common smoking pattern for both low and high SES groups and in all regions except London. Among low SES overall heavy smoking was more common than light smoking but there were very few significant differences for most regions and coefficients were reversed in SE and SW in the later time period (but differences were not significant).

Among high SES, rates of heavy and light smoking were similar except in 2006-8 rates of heavy smoking were lower than light smoking except for NE. Rates for England showed significant differences but regional differences often did not reach significance. In London, light, moderate and heavy smoking rates were not differentiable except that among high SES, heavy smoking was less common. These different patterns are the result of a decline in heavy smoking among high SES but not among low SES.

In conclusion there was no decline in light smoking among high or low SES. There was a small decline in moderate smoking among high SES but not low SES. Heavy smoking declined among high SES. There were strong indications, which did not reach significance, of a decline among low SES particularly in SE and SW. There were low rates of moderate and heavy smoking among low SES Londoners but high rates of light smoking among high SES Londoners. There were high rates of smoking among high SES in NE. There was evidence of a rise in moderate and particularly light smoking among low SES in the SE. The uniform decline in heavy smoking did not occur in low SES EM. Thus there were some regional differences in smoking consumption which may warrant future attention and monitoring.

It might be assumed that low SES would be linked just to heavy smoking but people with low SES were more likely to be light, moderate as well as heavy smokers. SES differences were weaker in Londoners and light smokers.

3.3.1.3 Regional consumption differences after taking other factors into account (HSE)

In models just taking age into account men and women in both time periods were most likely to be heavy smokers (Table 16) if they lived in northern regions. Once SES and ethnicity were taken into account there were no regional differences for men in either time period or women in the early time period. London women were less likely to be heavy smokers than women living in the northern regions in 2006-8.

Light smoking was more common among London men than men living in the northern regions in both time periods when age was the only variable taken into account. After SES and ethnicity were also taken into account, light smoking was more common among men living in London and the southern regions in the early time period but there were no significant differences in the later time period (although the difference between northern and southern men was almost significant). In models controlling only for age there were no significant regional differences for women. In models additionally controlling for SES and ethnicity, London women were more likely to be light smokers than northern women.

Figure 22 Rates of light, moderate and heavy smoking by region, count of low SES indicators and region

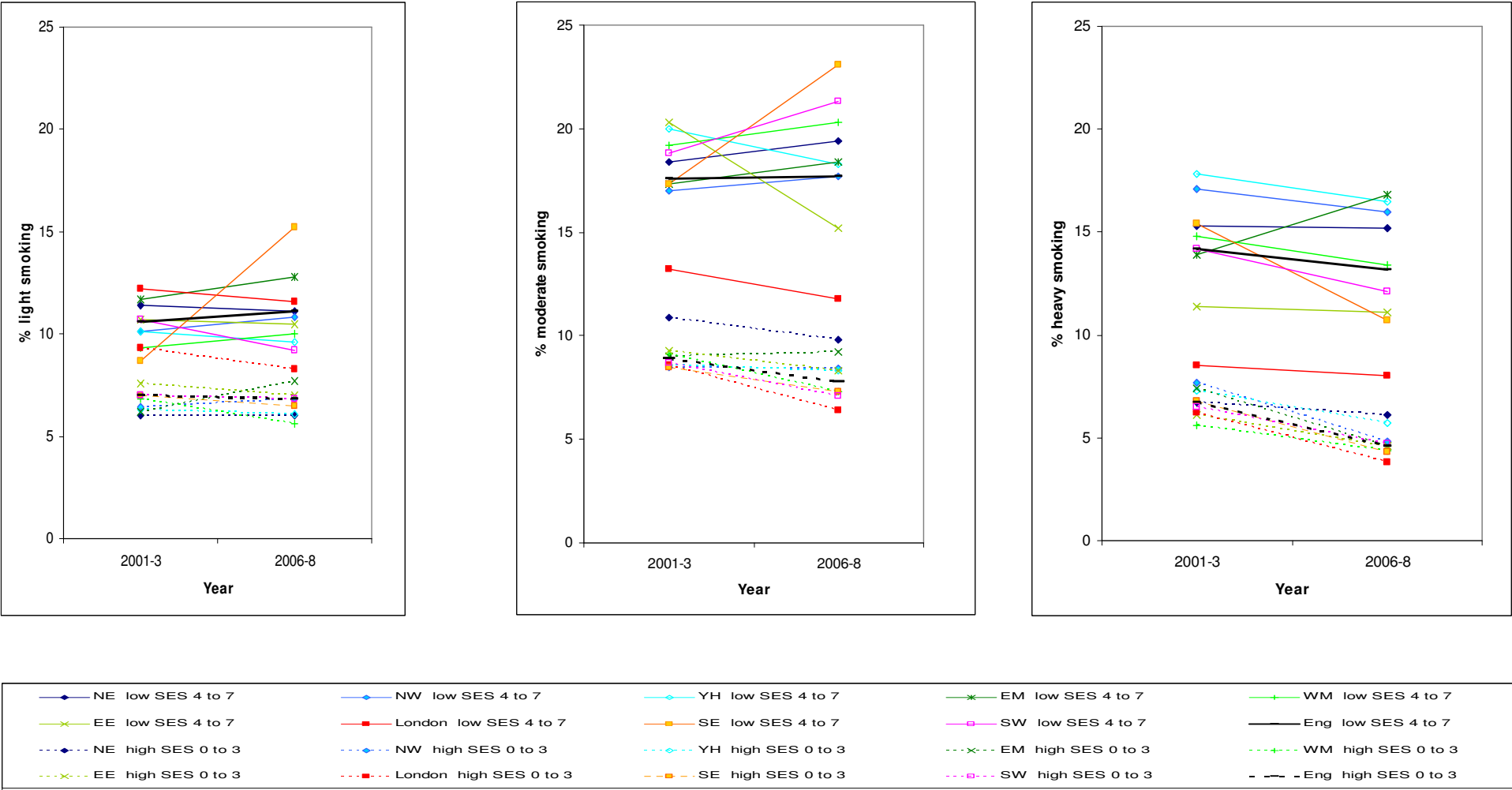


Table 15 Light, moderate and heavy smoking by region, SES and time

	Low SES		High SES		Change 01-03 to 06-08		
	2001-3 % (95%CI)	2006-8 % (95%CI)	2001-3 % (95%CI)	2006-8 % (95%CI)	Low SES	Hi SES	Diff
<i>Light smoking</i>							
	11.4	11.1	6.0	6.0			
NE	(9.4 to 13.7)	(7.9 to 15.5)	(5.0 to 7.2)	(4.9 to 7.3)	-0.3	0.0	0.3
	10.1	10.8	6.4	6.8			
NW	(8.2 to 12.3)	(8.6 to 13.6)	(5.6 to 7.3)	(6.1 to 7.6)	0.7	0.4	-0.3
	10.1	9.6	6.3	6.1			
YH	(8.1 to 12.5)	(7.4 to 12.3)	(5.4 to 7.4)	(5.2 to 7.2)	-0.5	-0.2	0.3
	11.7	12.8	6.2	7.7			
EM	(8.6 to 15.8)	(9.6 to 16.8)	(5.4 to 7.2)	(6.7 to 8.9)	1.1	1.5	0.4
	9.3	10.0	6.8	5.6			
WM	(6.7 to 12.8)	(7.4 to 13.6)	(5.9 to 7.8)	(4.7 to 6.7)	0.7	-1.2	-1.9
	10.7	10.5	7.6	7.0			
EE	(7.9 to 14.5)	(7.4 to 14.7)	(6.8 to 8.5)	(6.1 to 8.0)	-0.2	-0.6	-0.4
	12.2	11.6	9.3	8.3			
Lon	(10.0 to 14.8)	(9.3 to 14.3)	(8.2 to 10.4)	(7.2 to 9.5)	-0.6	-1.0	-0.4
	8.7	15.2	7.0	6.5			
SE	(6.5 to 11.5)	(11.6 to 19.7)	(6.3 to 7.8)	(5.7 to 7.5)	6.5	-0.5	-7.0
	10.7	9.2	7.0	6.8			
SW	(7.7 to 14.6)	(6.5 to 12.9)	(6.1 to 7.9)	(6.0 to 7.7)	-1.5	-0.2	1.3
	10.6	11.1	7.0	6.8			
Eng	(9.7 to 11.5)	(10.1 to 12.2)	(6.7 to 7.4)	(6.5 to 7.2)	0.5	-0.2	-0.7
<i>Moderate smoking</i>							
	18.4	19.4	10.9	9.8			
NE	(14.9 to 22.5)	(15.3 to 24.2)	(9.3 to 12.8)	(8.2 to 11.6)	1.0	-1.1	-2.1
	17.0	17.7	8.5	8.4			
NW	(14.9 to 19.5)	(14.9 to 21.0)	(7.6 to 9.5)	(7.5 to 9.3)	0.7	-0.1	-0.8
	20.0	18.3	8.6	8.3			
YH	(17.2 to 23.1)	(15.1 to 21.9)	(7.4 to 10.1)	(7.2 to 9.6)	-1.7	-0.3	1.4
	17.3	18.4	9.0	9.2			
EM	(13.7 to 21.5)	(13.9 to 23.9)	(7.8 to 10.3)	(8.1 to 10.5)	1.1	0.2	-0.9
	19.2	20.3	9.1	7.3			
WM	(16.1 to 22.8)	(16.8 to 24.4)	(8.1 to 10.2)	(6.3 to 8.4)	1.1	-1.8	-2.9
	20.3	15.2	9.3	8.3			
EE	(16.2 to 25.1)	(11.2 to 20.3)	(8.3 to 10.4)	(7.3 to 9.3)	-5.1	-1.0	4.1
	13.2	11.8	8.6	6.4			
Lon	(10.9 to 16.0)	(9.4 to 14.6)	(7.6 to 9.6)	(5.4 to 7.4)	-1.4	-2.2	-0.8
	17.3	23.1	8.5	7.3			
SE	(13.9 to 21.3)	(18.7 to 28.1)	(7.7 to 9.4)	(6.4 to 8.4)	5.8	-1.2	-7.0
	18.8	21.3	8.7	7.1			
SW	(14.7 to 23.8)	(17.5 to 25.7)	(7.6 to 9.9)	(6.2 to 8.1)	2.5	-1.6	-4.1
	17.6	17.7	8.9	7.8			
Eng	(16.5 to 18.7)	(16.4 to 19.0)	(8.5 to 9.2)	(7.4 to 8.1)	0.1	-1.1	-1.2

<i>Heavy smoking</i>							
	15.3	15.2	6.7	6.1			
NE	(12.7 to 18.4)	(12.3 to 18.7)	(5.5 to 8.1)	(4.9 to 7.6)	-0.1	-0.6	-0.5
	17.1	16.0	7.7	4.8			
NW	(14.3 to 20.2)	(13.4 to 19.1)	(6.8 to 8.7)	(4.1 to 5.7)	-1.1	<u>-2.9</u>	-1.8
	17.8	16.5	7.3	5.7			
YH	(14.9 to 21.1)	(13.4 to 20.1)	(6.4 to 8.3)	(4.8 to 6.7)	-1.3	-1.6	-0.3
	13.9	16.8	7.4	4.6			
EM	(11.2 to 17.3)	(11.6 to 23.7)	(6.5 to 8.4)	(3.8 to 5.4)	2.9	<u>-2.8</u>	-5.7
	14.8	13.4	5.6	4.4			
WM	(11.8 to 18.4)	(10.1 to 17.6)	(4.8 to 6.6)	(3.8 to 5.1)	-1.4	-1.2	0.2
	11.4	11.1	6.1	4.6			
EE	(8.4 to 15.3)	(7.9 to 15.4)	(5.2 to 7.1)	(3.8 to 5.5)	-0.3	-1.5	-1.2
	<u>8.5</u>	<u>8.0</u>	6.2	3.8			
Lon	<u>(6.6 to 10.9)</u>	<u>(5.8 to 10.8)</u>	(5.4 to 7.2)	(3.1 to 4.7)	-0.5	<u>-2.4</u>	-1.9
	15.4	10.7	6.8	4.3			
SE	(12.3 to 19.0)	(7.6 to 14.9)	(6.1 to 7.6)	(3.6 to 5.1)	-4.7	<u>-2.5</u>	2.2
	14.2	12.1	6.5	4.7			
SW	(10.9 to 18.4)	(8.8 to 16.4)	(5.6 to 7.4)	(4.0 to 5.5)	-2.1	<u>-1.8</u>	0.3
	14.2	13.2	6.7	4.6			
Eng	(13.2 to 15.3)	(12.1 to 14.4)	(6.4 to 7.0)	(4.4 to 4.9)	-1.0	<u>-2.1</u>	-1.1

Blue underlined font indicates significantly lower than England or significant decline

Red italic font indicates significantly higher than England or significant rise

'Diff' indicates the difference between the change in smoking rate in the high SES and low SES group. A positive number indicates a greater decline in low SES whereas a negative number indicates a greater decline in high SES

Table 16 OR (95% CI) of being a heavy smoker by grouped region taking into account age, count of low SES indicators and ethnicity

	Men		Women	
	2001-3	2006-8	2001-3	2006-8
<i>Controlling for age</i>				
NW,NE,YH	1	1	1	1
	0.84	0.80	0.79	0.83
EM,WM	(0.71 to 0.98)	(0.66 to 0.96)	(0.67 to 0.92)	(0.68 to 1.00)
	0.78	0.70	0.74	0.66
EE,SE,SW	(0.68 to 0.90)	(0.60 to 0.82)	(0.64 to 0.85)	(0.56 to 0.78)
	0.75	0.68	0.61	0.46
London	(0.61 to 0.92)	(0.53 to 0.88)	(0.50 to 0.75)	(0.35 to 0.61)
<i>Controlling for age, SES and ethnicity</i>				
NW,NE,YH	1	1	1	1
	0.94	0.87	0.89	0.94
EM,WM	(0.80 to 1.10)	(0.72 to 1.05)	(0.76 to 1.04)	(0.78 to 1.14)
	0.96	0.89	0.91	0.85
EE,SE,SW	(0.84 to 1.11)	(0.76 to 1.04)	(0.80 to 1.05)	(0.72 to 1.02)
	0.94	0.88	0.86	0.67
London	(0.77 to 1.16)	(0.69 to 1.14)	(0.69 to 1.07)	(0.50 to 0.89)

Bold font indicates non overlapping confidence intervals

(see also Appendix 3 tables A3i1 A3i2 and A3i5)

Table 17 OR (95% CI) of being a light smoker by grouped region taking into account age, count of low SES indicators and ethnicity

	Men		Women	
	2001-3	2006-8	2001-3	2006-8
<i>Controlling for age</i>				
NW,NE,YH	1	1	1	1
	1.08	1.03	0.94	1.05
EM,WM	(0.89 to 1.30)	(0.85 to 1.25)	(0.80 to 1.10)	(0.89 to 1.23)
	1.10	1.07	1.05	1.00
EE,SE,SW	(0.94 to 1.28)	(0.92 to 1.26)	(0.92 to 1.20)	(0.87 to 1.15)
	1.49	1.24	1.18	1.08
London	(1.22 to 1.82)	(1.00 to 1.54)	(0.99 to 1.40)	(0.87 to 1.34)
<i>Controlling for age, SES and ethnicity</i>				
NW,NE,YH	1	1	1	1
	1.10	1.05	0.97	1.11
EM,WM	(0.91 to 1.33)	(0.86 to 1.27)	(0.83 to 1.14)	(0.94 to 1.30)
	1.22	1.16	1.12	1.09
EE,SE,SW	(1.05 to 1.42)	(0.98 to 1.37)	(0.98 to 1.28)	(0.95 to 1.27)
	1.45	1.14	1.27	1.34
London	(1.17 to 1.79)	(0.90 to 1.44)	(1.06 to 1.54)	(1.08 to 1.66)

Bold font indicates non overlapping confidence intervals

(see also Appendix 3 tables A3i3 A3i4 and A3i5)

3.3.2 Smoking consumption (STS)

Percentages of light, moderate and heavy smoking, defined in the same way as HSE, were calculated for low social grade (C2,D,E) and high social grade (A,B,C1). Between 2007 and 2009 heavy smoking declined among C2DE but there was not a clear pattern for the other categories. This reflects the plateauing of smoking decline in general in the STS particularly among those with high social grade.

Londoners of higher social grade had particularly high levels of light smoking, and both groups of Londoners had low levels of moderate and heavy smoking. For both social grades, there were more moderate and heavy smokers in northern than southern regions.

Thus STS consumption results closely follow HSE results despite using a very different measure of SES. Low SES in the STS are all those disadvantaged due to their occupation whereas low SES in the HSE was operationalised as having 4 or more indicators of low SES. This is why smoking rates, particularly among low SES, in Table 18 are higher than Table 12.

Table 18 Percentage of light, moderate and heavy smoking (95% CI)* by social grade 2007-9 (STS)

	Light <10 per day		Moderate 10 to 19 per day		Heavy 20+ per day	
	C2, D, E	AB, C1	C2, D, E	AB, C1	C2, D, E	AB, C1
	Low SES	High SES	Low SES	High SES	Low SES	High SES
<i>TOTAL</i>	7.5 (7.2-7.8)	5.6 (5.4-5.9)	13.0 (12.6-13.4)	6.6 (6.3-6.8)	9.9 (9.5-10.2)	4.1 (3.9-4.3)
<i>Year</i>						
2007	7.5 (7.0-8.0)	6.1 (5.7-6.6)	13.7 (13.0-14.4)	7.1 (6.6-7.5)	10.5 (9.9-11.1)	4.6 (4.3-5.0)
2008	7.7 (7.2-8.3)	5.3 (4.8-5.7)	12.5 (11.8-13.2)	6.2 (5.8-6.7)	10.0 (9.4-10.7)	3.7 (3.3-4.0)
2009	7.3 (6.7-7.8)	5.5 (5.1-5.9)	12.6 (11.9-13.3)	6.3 (5.9-6.7)	9.0 (8.4-9.6)	3.9 (3.5-4.2)
<i>Region</i>						
NE	6.4 (5.2-7.7)	4.6 (3.6-5.6)	15.1 (13.2-16.9)	7.0 (5.8-8.2)	12.4 (10.7-14.1)	4.4 (3.4-5.4)
NW	7.7 (6.9-8.6)	5.5 (4.8-6.2)	14.3 (13.2-15.4)	8.1 (7.3-8.9)	10.8 (9.8-11.7)	5.2 (4.5-5.8)
YH	7.4 (6.5-8.3)	5.8 (4.9-6.6)	13.3 (12.1-14.5)	7.4 (6.5-8.4)	12.7 (11.6-13.9)	4.6 (3.9-5.4)
EM	7.0 (6.0-8.0)	5.5 (4.6-6.3)	14.3 (12.9-15.7)	6.5 (5.6-7.4)	10.7 (9.5-11.9)	4.3 (3.5-5.0)
WM	7.6 (6.7-8.5)	5.9 (5.1-6.7)	14.1 (12.9-15.3)	6.2 (5.4-7.0)	11.7 (10.6-12.8)	4.7 (3.9-5.4)
EE	7.7 (6.8-8.6)	5.9 (5.2-6.6)	13.7 (12.5-14.9)	6.5 (5.8-7.2)	8.1 (7.1-9.0)	3.3 (2.8-3.9)
Lon	7.6 (6.7-8.4)	6.5 (5.8-7.1)	9.1 (8.2-10.0)	5.3 (4.7-5.9)	6.2 (5.5-7.0)	2.8 (2.3-3.2)

SE	7.8 (6.9-8.7)	5.3 (4.7-5.9)	12.9 (11.8-14.0)	6.4 (5.7-7.0)	9.3 (8.4-10.3)	4.4 (3.9-5.0)
SW	7.4 (6.4-8.3)	5.2 (4.4-5.9)	11.7 (10.5-12.9)	6.3 (5.5-7.1)	8.7 (7.6-9.7)	3.7 (3.1-4.4)
<i>Group</i>						
Northern	7.4 (6.8-7.9)	5.4 (5.0-5.9)	14.1 (13.3-14.8)	7.7 (7.2-8.2)	11.8 (11.1-12.4)	4.8 (4.4-5.3)
Midlands	7.4 (6.7-8.0)	5.7 (5.1-6.3)	14.1 (13.2-15.1)	6.3 (5.7-6.9)	11.3 (10.5-12.1)	4.5 (4.0-5.0)
Southern	7.6 (7.1-8.2)	5.4 (5.1-5.8)	12.8 (12.1-13.5)	6.4 (6.0-6.8)	8.7 (8.2-9.3)	3.9 (3.6-4.2)
London	7.6 (6.7-8.4)	6.5 (5.8-7.1)	9.1 (8.2-10.0)	5.3 (4.7-5.9)	6.2 (5.5-7.0)	2.8 (2.3-3.2)

* Data are weighted but not adjusted for sample clustering. Sample sizes are not weighted.

(see also Appendix 3 tables A3j1 A3j2 and A3j3)

3.3.3 Summary

- HSE & STS data agree that
 - Low SES had higher rates of low, moderate and heavy smoking than high SES
 - north/south regional differences with higher levels of moderate and heavy smoking among northern than southern regions
 - Londoners had particularly low levels of moderate and heavy smoking and high rates of light smoking among high SES
- HSE data also showed that
 - women were more likely to be light smokers if they lived in London and heavy smokers in northern England even after controls.
 - the proportion of low SES light smokers in the SE appeared to be growing
- HSE and STS data differed in that
 - high rates of light smoking in London were also evident among low SES in HSE
 - more evidence of a decline in heavy smoking among high SES in HSE and low SES in STS (this mirrors prevalence trend differences).

3.4. Smoking cessation by SES and region

In this section smoking cessation by region and SES is explored in three forms: the proportion of ex-smokers (HSE), recent quit attempts (STS) and four week smoking cessation rates from the SSS.

3.4.1 Quitters (HSE)

Smoking prevalence, in general appeared to be falling. This could be the result of fewer people in the population ever have taking up smoking and/or increased smoking cessation

3.4.1.1 Quitters (HSE) - Methodology

In the HSE quitters or 'ex-smokers' are defined as ex-regular smokers and 'never smokers' are defined as 'never been a regular smoker'. Two analyses were undertaken: firstly regional quit rates by SES were established and secondly whether there were residual regional differences after other sociodemographic factors were taken into account were determined.

Percentages of current, ex and never cigarette smoking by region and count of low SES indicators (divided into two categories 'high SES' 0 to 3 indicators and 'low SES' 4 to 7 indicators) for 2001-2003 and 2006-2008 were calculated. Three year averages were used to reduce data noise. Using confidence intervals, significant regional differences compared to the English average and significant changes over time were noted for low and high SES groups.

Logistic regression analysis was used to determine whether there were north/south regional effects and a 'London effect' once other factors were taken into account. The outcome variable was ex-smokers compared with current and never smokers. Regions were grouped into northern (NE,NW,YH), midlands (EM ,WM), southern (EE,SE,SW) and London. Separate regression analyses were performed for each gender and each time period providing four models. These models had two stages: firstly age and regional grouping were entered and secondly count of SES indicators and ethnicity were added.

3.4.1.2 Regional quit rates in comparison with current and never smokers (HSE)

Rates of current smoking, ex-smoking and never smoking were compared (Figure 23 and Table 19). Among current smokers the count of low SES indicators follows a similar pattern to the individual indicators (section 3.2.2) with higher rates among low SES than high SES. Low SES smoking rates were double the high SES rates. Additionally there were low smoking rates in low SES Londoners and significant falls in high SES rates overall. There were falls in all regions and the significant falls were in WM, London, SE, SW and England. The high rates in the NE in individual indicators were not replicated in this composite variable. A few gentle rises in the low SES EM and SE regions have been magnified in the count variable. These rises were not significant in the count variable and were not replicated in the GHS so were likely to be anomalies.

About a quarter of high SES had quit smoking but only about a fifth of low SES had done so. There were fewer quitters in London among low and high SES than the England average. In 2006-8 there were more high SES quitters in SE than the England average. The proportion of quitters declined among low SES and this was replicated in all regions except SW. Large, but non significant, drops were found in NE, EE and SE. There was no significant change over time in quitting among high SES.

There were significantly more never smokers among high SES (just over half) than low SES (about two fifths). NE had significantly fewer never smokers among low SES. London had significantly more low and high SES never smokers. There were increases in the proportions of low SES never smokers in all regions except EM, SE and SE and there was a significant (12%) rise in EE. Among high SES never smokers increased in all regions and significantly so in YH, London, SW and England. Overall there was a greater rise in the proportion of never smokers among high than low SES.

3.4.1.3 Regional differences after taking other factors into account (HSE)

Logistic regression analysis was used to explore the impact other factors had on the relationship between region and quitting. After taking age into account, Londoners were significantly less likely to be quitters in all models (Table 22, further information presented in Appendix 3 tables A3a1 and A3a2). In the later period men were more likely to be quitters if they lived in the south compared to the north of England. There was a similar increase in the odds ratio for women but it did not reach significance. Both the London and the North/South effect disappeared when SES and ethnicity were taken into account.

Figure 23 Rates of current, ever and never smoking by region, count of low SES indicators and region

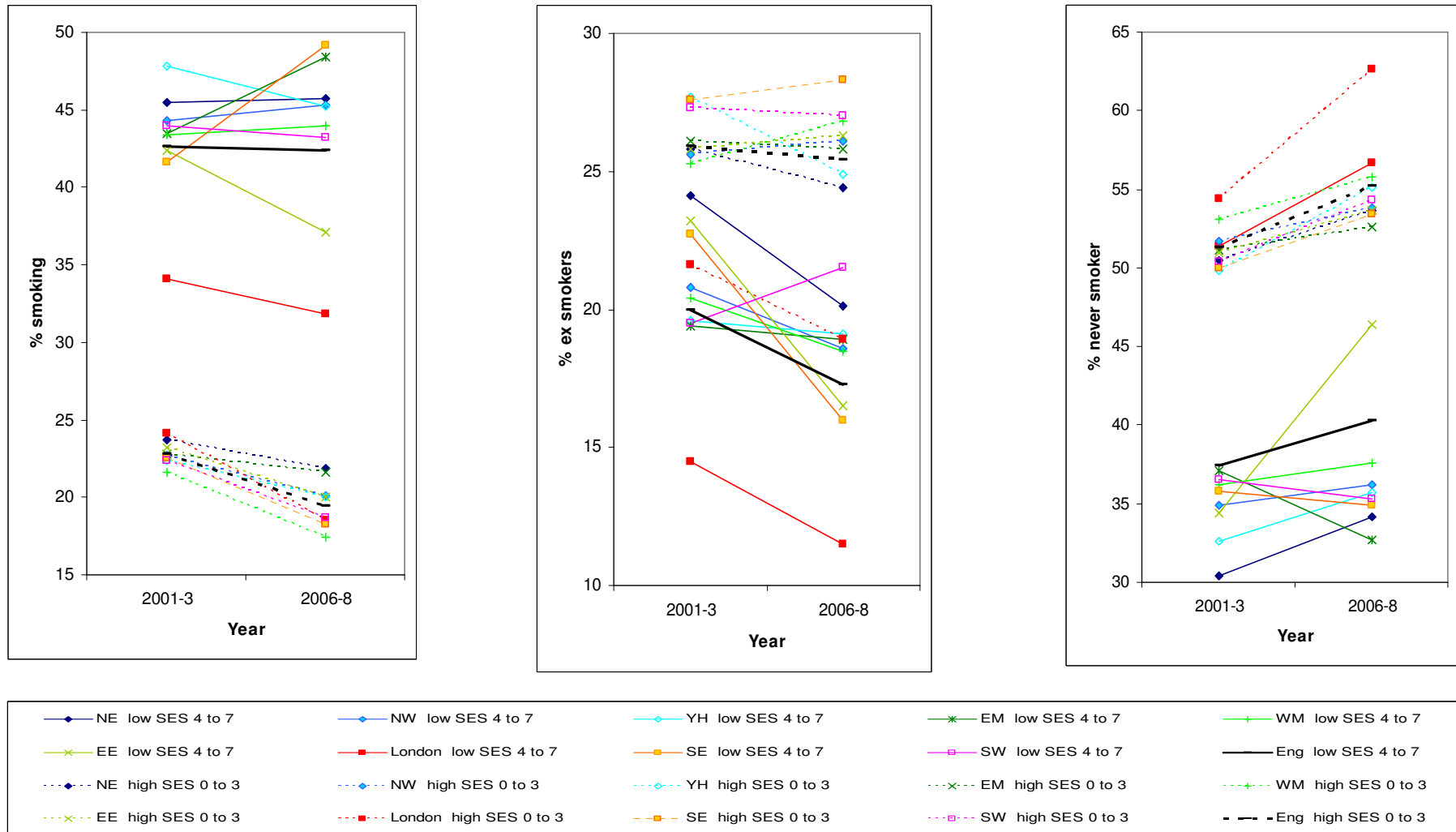


Table 19 Rates of current, ever and never smoking by region, count of low SES indicators and region

	Low SES		High SES		Change 01-03 to 06-08		
	2001-3	2006-8	2001-3	2006-8	Low SES	Hi SES	Diff
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)			
<i>Current</i>							
NE	45.5 (41.4 to 49.7)	45.7 (40.1 to 51.5)	23.7 (21.5 to 26.0)	21.9 (19.5 to 24.4)	0.2	-1.8	-2.0
NW	44.3 (40.8 to 47.9)	45.3 (41.6 to 48.9)	22.7 (21.3 to 24.3)	20.1 (18.7 to 21.6)	1.0	-2.6	-3.6
YH	47.8 (43.9 to 51.7)	45.2 (40.7 to 49.8)	22.4 (20.4 to 24.6)	20.0 (18.2 to 21.9)	-2.6	-2.4	0.2
EM	43.5 (38.7 to 48.5)	48.4 (40.8 to 56.1)	22.8 (21.0 to 24.6)	21.6 (19.8 to 23.6)	4.9	-1.2	-6.1
WM	43.4 (38.6 to 48.3)	44.0 (38.4 to 49.7)	21.6 (19.9 to 23.4)	17.4 (15.9 to 19.0)	0.6	-4.2	-4.8
EE	42.4 (37.1 to 47.9)	37.1 (30.9 to 43.8)	23.2 (21.5 to 25.0)	20.0 (18.5 to 21.6)	-5.3	-3.2	2.1
Lon	34.1 (30.0 to 38.5)	31.8 (27.8 to 36.0)	24.1 (22.4 to 25.8)	18.5 (16.7 to 20.4)	-2.3	-5.6	-3.3
SE	41.6 (36.6 to 46.7)	49.2 (43.3 to 55.1)	22.5 (21.1 to 23.9)	18.3 (16.6 to 20.1)	7.6	-4.2	-
SW	44.0 (38.4 to 49.7)	43.2 (37.4 to 49.3)	22.4 (20.6 to 24.2)	18.7 (17.2 to 20.3)	-0.8	-3.7	-2.9
Eng	42.6 (41.0 to 44.2)	42.4 (40.6 to 44.2)	22.8 (22.2 to 23.4)	19.4 (18.8 to 19.9)	-0.2	-3.4	-3.2
<i>Ex</i>							
NE	24.1 (20.7 to 27.7)	20.1 (16.7 to 24.0)	25.8 (23.5 to 28.2)	24.4 (22.1 to 26.9)	-4.0	-1.4	2.6
NW	20.8 (17.9 to 24.1)	18.6 (16.0 to 21.5)	25.6 (24.2 to 27.0)	26.1 (24.7 to 27.5)	-2.2	0.5	2.7
YH	19.6 (16.9 to 22.7)	19.1 (15.6 to 23.1)	27.7 (26.0 to 29.5)	24.9 (23.3 to 26.5)	-0.5	-2.8	-2.3
EM	19.4 (16.4 to 22.9)	18.9 (15.0 to 23.4)	26.1 (24.3 to 28.1)	25.8 (23.8 to 27.9)	-0.5	-0.3	0.2
WM	20.4 (17.5 to 23.7)	18.5 (15.1 to 22.4)	25.3 (23.7 to 27.0)	26.8 (25.2 to 28.4)	-1.9	1.5	3.4
EE	23.2 (18.8 to 28.3)	16.5 (12.6 to 21.3)	25.8 (24.3 to 27.4)	26.3 (24.7 to 27.9)	-6.7	0.5	7.2
Lon	14.5 (12.3 to 17.0)	11.5 (9.3 to 14.1)	21.6 (20.1 to 23.1)	18.9 (17.4 to 20.6)	-3.0	-2.7	0.3
SE	22.7 (19.1 to 26.8)	16.0 (12.1 to 20.8)	27.6 (26.3 to 28.9)	28.3 (26.8 to 29.9)	-6.7	0.7	7.4
SW	19.5 (16.1 to 23.4)	21.5 (16.8 to 26.9)	27.3 (25.7 to 29.0)	27.0 (25.6 to 28.5)	2.0	-0.3	-2.3
Eng	20.0 (18.9 to 21.1)	17.3 (16.1 to 18.6)	25.9 (25.4 to 26.4)	25.4 (24.9 to 26.0)	-2.7	-0.5	2.2
<i>Never</i>							
NE	30.4 (26.7 to 34.4)	34.2 (28.5 to 40.4)	50.5 (47.8 to 53.3)	53.7 (51.0 to 56.5)	3.8	3.2	-0.6

NW	34.9 (31.4 to 38.6)	36.2 (32.4 to 40.1)	51.7 (50.0 to 53.4)	53.8 (52.0 to 55.6)	1.3	2.1	0.8
YH	32.6 (29.0 to 36.4)	35.7 (31.1 to 40.6)	49.8 (47.4 to 52.3)	55.1 (52.9 to 57.3)	3.1	5.3	2.2
EM	37.1 (32.3 to 42.1)	32.7 (25.3 to 41.1)	51.1 (49.0 to 53.2)	52.6 (50.5 to 54.8)	-4.4	1.5	5.9
WM	36.2 (32.2 to 40.4)	37.6 (32.4 to 43.1)	53.1 (51.0 to 55.1)	55.8 (53.8 to 57.9)	1.4	2.7	1.3
EE	34.4 (30.2 to 38.8)	46.4 (39.8 to 53.1)	51.0 (49.0 to 52.9)	53.7 (51.8 to 55.7)	12.0	2.7	-9.3
Lon	51.4 (46.6 to 56.1)	56.7 (52.8 to 60.6)	54.4 (52.4 to 56.3)	62.6 (60.2 to 64.9)	5.3	8.2	2.9
SE	35.8 (30.9 to 41.0)	34.9 (29.9 to 40.2)	50.0 (48.4 to 51.6)	53.4 (51.5 to 55.3)	-0.9	3.4	4.3
SW	36.5 (31.5 to 41.8)	35.3 (30.0 to 41.0)	50.4 (48.4 to 52.3)	54.3 (52.6 to 56.0)	-1.2	3.9	5.1
Eng	37.4 (35.9 to 39.0)	40.3 (38.5 to 42.1)	51.3 (50.7 to 52.0)	55.2 (54.5 to 55.9)	2.9	3.9	1.0

Blue underlined font indicates significantly lower than England or significant decline

Red italic font indicates significantly higher than England or significant rise

‘Diff’ indicates the difference between the change in smoking rate in the high SES and low SES group. A positive number indicates a greater decline in low SES whereas a negative number indicates a greater decline in high SES. However where rates were rising a positive number indicates a greater rise among high SES (see also Appendix 3 tables A3a1 and A3a2)

Table 20 OR (95% CI) of being an ex smoker by grouped region taking into account age, count of low SES indicators and ethnicity

	Men		Women	
	2001-3	2006-8	2001-3	2006-8
<i>Controlling for age</i>				
NW,NE,Y				
H	1	1	1	1
	0.98	1.01	0.94	1.03
EM,WM	(0.88 to 1.09)	(0.91 to 1.13)	(0.85 to 1.04)	(0.94 to 1.14)
	1.04	1.11	1.03	1.08
EE,SE,SW	(0.95 to 1.14)	(1.02 to 1.22)	(0.95 to 1.12)	(0.99 to 1.17)
	0.86	0.77	0.80	0.73
London	(0.75 to 0.98)	(0.66 to 0.89)	(0.71 to 0.91)	(0.63 to 0.85)
<i>Controlling for age, SES and ethnicity</i>				
NW,NE,Y				
H	1	1	1	1
	0.98	1.01	0.94	1.04
EM,WM	(0.88 to 1.09)	(0.91 to 1.13)	(0.85 to 1.04)	(0.95 to 1.15)
	0.99	1.06	0.99	1.05
EE,SE,SW	(0.90 to 1.08)	(0.97 to 1.16)	(0.91 to 1.07)	(0.96 to 1.14)
	0.97	0.90	0.96	0.95
London	(0.84 to 1.12)	(0.77 to 1.05)	(0.85 to 1.09)	(0.81 to 1.10)

Bold font indicates non overlapping confidence intervals

(see also Appendix 3 tables A3k1 and A3k2)

3.4.2 Quit attempts and quitting in the last year (STS)

STS respondents who indicate that they have smoked during the last year are asked whether they have stopped smoking or made a quit attempt in the past year.

About two fifths of smokers had made a quit attempt in the past year (Table 21).

There were fewer quit attempts in 2009 than 2007. There were no differences by region or social grade.

In addition to there being fewer quit attempts in 2009 than 2007, there were also fewer successful quitters. This difference was significant for low social grade but not high social grade (see also [176]). Smokers were more likely to quit if they were of higher social grade for all years and regions except the northern regions which had the lowest high social grade quit rates. There were no significant regional differences in quit rates.

Table 21 Percentage of smokers making a quit attempt and successfully quitting during the previous year (95% CI)* by social grade, year and region (STS)

	Total % (95% CI)	N	AB,C1 % (95% CI)	N	C2,D,E % (95% CI)	N
<i>Quit attempts</i>						
TOTAL	39.9 (39.2-40.7)	6408	40.3 (39.1-41.6)	2181	39.7 (38.7-40.8)	4227
2007	42.5 (41.3 to 43.8)	2636	43.7 (41.8 to 45.6)	931	41.7 (40.0 to 43.3)	1705
2008	39.9 (38.4 to 41.3)	1889	40.8 (38.6 to 43.1)	621	39.2 (37.4 to 41.0)	1268
2009	37.0 (35.6 to 38.3)	1883	35.6 (33.6 to 37.7)	629	38.0 (36.2 to 39.7)	1254
NE,NW,YH	39.3 (37.9 to 40.7)	2033	40.2 (37.9 to 42.4)	626	38.8 (37.1 to 40.5)	1407
WM,EM	41.4 (39.7 to 43.1)	1304	41.9 (39.1 to 44.7)	386	41.1 (38.9 to 43.2)	918
EE,SE,SW	39.2 (37.9 to 40.5)	2123	39.6 (37.7 to 41.5)	807	38.9 (37.2 to 40.7)	1316
London	41.5 (39.2 to 43.7)	948	40.1 (36.9 to 43.3)	362	42.8 (39.6 to 46.0)	586
<i>Successful quit attempts</i>						
TOTAL	7.0 (6.6-7.4)	1088	8.5 (7.8-9.2)	468	5.9 (5.4-6.4)	620
2007	8.0 (7.3 to 8.7)	474	9.3 (8.2 to 10.4)	200	7.0 (6.1 to 7.8)	274
2008	6.7 (6.0 to 7.4)	312	8.6 (7.3 to 9.9)	134	5.4 (4.6 to 6.3)	178
2009	6.1 (5.4 to 6.8)	302	7.3 (6.2 to 8.5)	134	5.2 (4.3 to 6.0)	168
NE,NW,YH	6.7 (6.0 to 7.4)	344	7.9 (6.7 to 9.1)	127	5.9 (5.1 to 6.8)	217
WM,EM	7.4 (6.5 to 8.3)	220	9.3 (7.6 to 10.9)	88	6.3 (5.2 to 7.4)	132
EE,SE,SW	7.0 (6.3 to 7.7)	373	8.5 (7.4 to 9.5)	176	5.8 (5.0 to 6.7)	197
London	7.0 (5.9 to 8.2)	151	8.7 (6.9 to 10.5)	77	5.4 (4.0 to 6.9)	74

* Data are weighted but not adjusted for sample clustering

3.4.3 NHS Stop Smoking Services (SSS) quit rates

Four week quit rates are available from NHS smoking cessation programmes. Four weeks is counted from each client's nominated quit date. There are currently data available on socioeconomic status and region for two financial years 2008/9 [147] and

2009/10 [148] (April until March). The regions used are Strategic Health Authorities. These are the same as Government Office Regions except that SE is divided into South Central and South East Coast. SES, in the SSS dataset, is categorised in the following way: those who are working are classified into professional & managerial, intermediate and routine & manual and those who are not working are subdivided into students, unemployed, retired, permanently sick, and home carers.

Quit rates were calculated for each SES group for each region for the two time periods (Figures 24a and b (see also Appendix 3 tables A311 A312 and A313)). Age strongly affected quit rates. Quitting was highest amongst retired people (58.0 (57.7 to 58.4)) and lowest amongst students (35.1 (34.6 to 35.6)). Among those working, those in professional and managerial occupations were more likely to quit (57.1 (56.8 to 57.5)) than those with routine and manual occupations (52.9 (52.6 to 53.1)). All working groups had higher quit rates than the non-working groups (except retired). Other than students the lowest quit rates were amongst the unemployed (39.5 (39.1 to 39.8)). These patterns were similar for all the regions - it was not the case that for example low SES did better in some regions and high SES did better in others. There were some regional differences and some regions appeared to have higher quit rates than others (Table 22). Poorer quit rates were found in the NE and NW, regions with high smoking rates. However, poorer quit rates were also found in the WM and London. The most successful region was EM. The southern regions were also fairly successful. EE was more successful than England in the earlier time period but less successful in the later time period whereas YH was more successful in the later time period.

Table 22 Number of SES classifications where confidence intervals did not overlap with those for England

Year	Quit rates lower than England		Quit rates higher than England	
	09/10	08/09	09/10	08/09
NE	8	5	0	0
NW	7	5	0	0
YH	1	1	6	3
EM	0	0	9	9
WM	9	6	0	0
EE	2	1	1	5
Lon	6	6	1	2
SEC	0	1	7	4
SC	0	0	7	6
SW	0	1	7	5

Figure 24a Stop Smoking Services 4 week quit rates by SES and region 2008/9

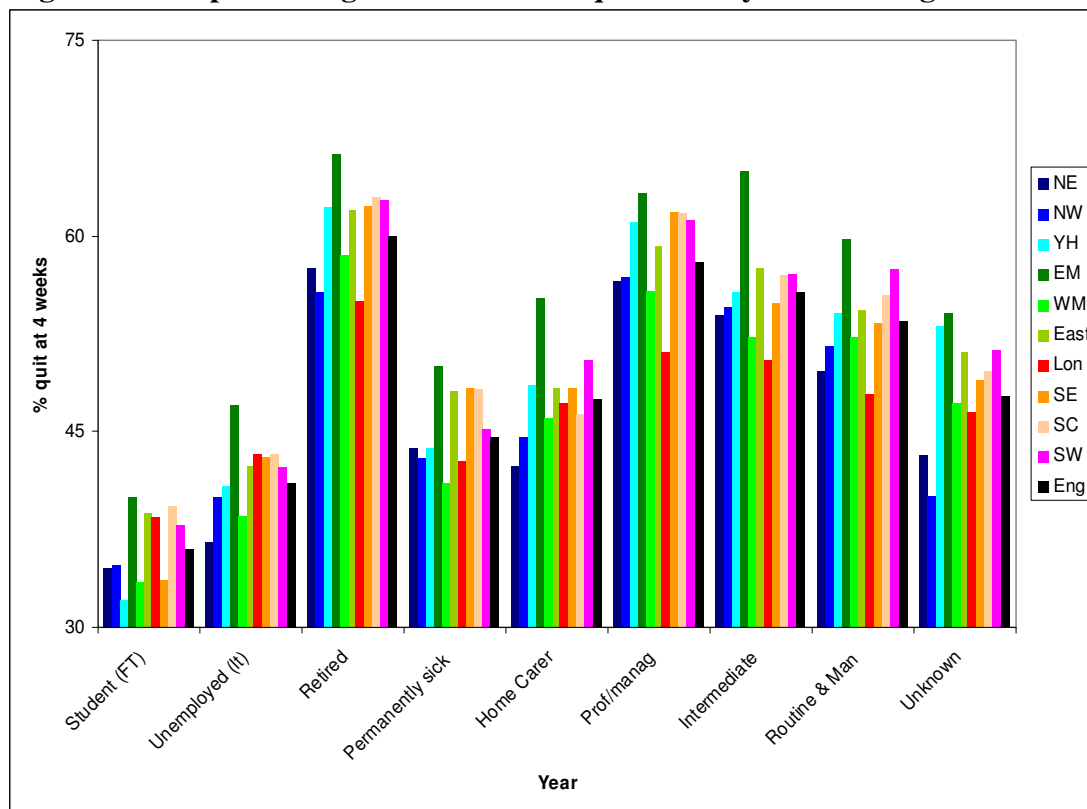
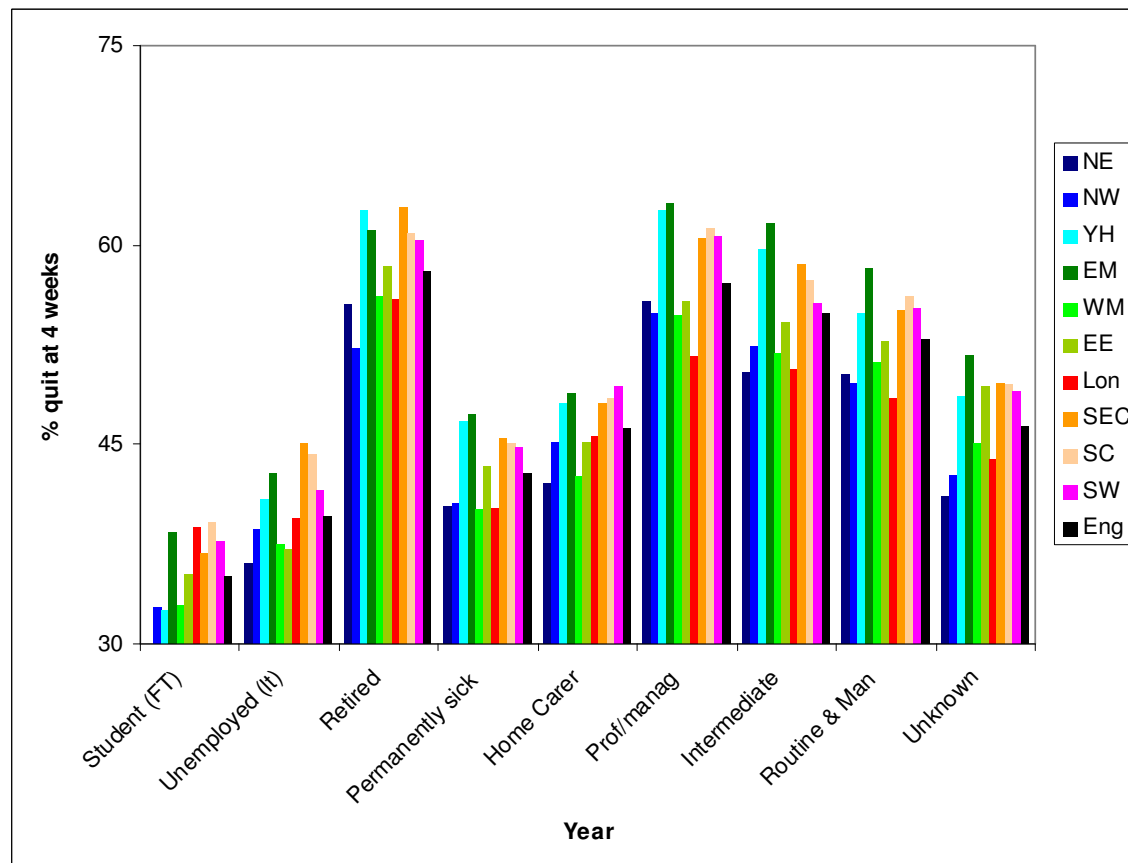


Figure 24b Stop Smoking Services 4 week quit rates by SES and region 2009/10



3.4.4 Summary- what do the HSE, STS and SSS data tell us about quitting?

The HSE provides information on those who have ever quit smoking. Some regional differences emerged.

- There were some indications that there were more quitters in southern England due to a higher proportion of the population being of higher SES.
- Fewer quitters in London could be explained by fewer people ever having taken up smoking for cultural (ethnic) reasons.

Some national quitting patterns emerged:

- Quitting was more common amongst those with high SES.
- The proportion of quitters declined among low SES and remained stable among high SES.
- Thus HSE data appears to imply that smoking rates had declined during 2001-8 because of an increase in the proportion of never smokers rather than an increase in the number of quitters.

Data on recent quitters and quit attempts is provided by the STS.

- Quit attempts fell between 2007-9 as did successful quit attempts.
- There was no significant SES difference in quit attempts but high SES were more likely to quit successfully.
- There were no significant regional differences.

There were regional differences in SSS quit rates.

- Northern regions had low rates and southern regions had higher rates.
- However EM was the most successful and London and WM were least successful. SES effects on SSS quit rates appeared in all regions.
- The highest quit rates were found among SES groups with a higher proportion of older ages such as professional/managerial and retired whereas the lowest quit rates were found among those outside the labour market.

3.5 Discussion

3.5.1 Main findings

This analysis has outlined local variations in smoking and quitting in England, using routine and survey data. The key findings are:

- Most of the regional differences in smoking prevalence, consumption and cessation can be explained by differences in the age, ethnic and socioeconomic structure of regional populations.
- Socioeconomic inequalities in smoking prevalence, consumption and cessation exist in all regions, with smoking concentrated among the multiply deprived.
- Heavy smoking declined in the period (2001-2008) examined
- The decline in smoking during this period seems to be more the result in the growth of never smokers than a rise in the proportion of quitters
- There may have been a recent (2008-2010) decline in quitting and quit attempts but further work is necessary to confirm this trend.
- Trends in inequalities over time differed with the data source so no firm conclusions were reached

- The datasets currently published will be insufficient to understand the impact of the new NHS structure of local authority based public health and GP consortia
- Strata and cluster indicators need to be made available for all national surveys

In discussing these results we first outline general trends in the data, then regional trends, limitations of the study, data issues and conclude with some considerations for future research.

3.5.2 General trends

There were some trends that tended to be followed by all the regions. Smoking prevalence and heavy smoking declined between 2001 and 2008. However, the STS data have shown little or no decline since the start of the current recession in the first quarter of 2008 which appears to be attributable to a decline in the rate of attempts to stop. Whether the recession has played a causal role in the slowing of prevalence decline is not clear.

From 2001-8, smoking in England was declining because of cessation, smokers dying and an increase in the proportion of never smokers in the population. This last effect was greater than the impact of cessation on the proportion of smokers in the population. It is beyond the scope of this analysis to identify why this has occurred. It is likely that an increase in the proportion of ethnic groups with lower smoking rates in the English population may be at least part of the explanation. Thus it is important to note that not all low SES groups do have high smoking rates. Low SES ethnic minorities may or may not follow the smoking patterns of the white British majority.

Those experiencing low SES are a diverse population. The highest smoking rates were found among lone parents and those with multiple indications of low SES. Smoking prevalence may be particularly high among lone parents due to the poverty, stress and culture experienced by them [174, 177] and because quit rates are higher among older people whose children tend to have reached adulthood. In general, where analyses excluded older people the decline in smoking among high SES groups was less evident. Women are overrepresented among low income groups because make up a high proportion of lone parents and single pensioners (although poverty rates declined in these groups over the analysis period) [178]. Thus the analysis here confirms the importance of taking into account the age, gender and ethnic structure of the population when looking for reasons underlying trends in smoking prevalence.

In general, we can conclude that significant inequalities existed in smoking prevalence, consumption and cessation in England throughout the first decade of the 21st century. We cannot, however, be confident about whether inequalities have declined or grown due to differences between datasets. HSE data would support an increase in inequalities due to more evidence of a decline among high SES groups, GHS data would imply little change and STS data might suggest a recent decrease arising from the tailing off of the high SES prevalence decline. However, rather than national trends, the aim of this report was to explore regional differences and we summarise these next.

3.5.3 Regional trends

Regional differences in smoking prevalence, consumption and cessation were found. Such differences appeared to be more prominent within low SES groups than high SES groups perhaps partly the results of smaller numbers in low SES groups. Northern regions' smoking rates were higher particularly when compared with southern regions. This effect disappeared when SES was taken into account.

London had lower smoking rates and higher never smoking rates. This was likely to be a result the presence of a markedly higher proportion of ethnic minorities than other regions (there were some indications of a similar possible effect for the West Midlands, where the next highest proportion of ethnic minorities reside). London differs from elsewhere in other respects besides ethnicity. High property values, for example, price out many people who in other regions would be able to obtain mortgages (although this phenomenon is now growing in the rest of England) [179]. Additionally London is the only region without a rural component thus congestion and availability of public transport reduce the utility of car ownership in London [180]. Londoners are therefore less likely to own houses and cars than those of equivalent SES living elsewhere in England. Light smoking was most common in London, particularly among women – this effect was independent of SES and ethnicity.

There were some, thus far non-significant, increases in smoking among low SES in the South East and East Midlands which may need to be monitored in future, although they may be due to data error as these were not found in the GHS. Moreover Stop Smoking Service four week quit rates were highest in the East Midlands.

3.5.4 Limitations

Our analysis was limited in various ways by the data available. In this report two time periods 2001-3 and 2006-8 were contrasted. Sample sizes were too small to analyse years individually. Thus the report may give the impression of clearer trends than actually exist. Preliminary annual analysis suggested volatility in annual rates. Regional HSE sample sizes, particularly among low SES, were sometimes insufficient to show significance despite substantial differences in percentages and sizable odds ratios. Small numbers also meant that for some analyses (e.g. by gender) regional groups had to be used. It must be noted that there were large variations within regional groupings. In particular smoking status in the East Midlands often seemed closer to the northern regions whereas the West Midlands seemed closer to the southern regions. Not all analyses portrayed the north-south pattern.

We were also limited by cross-sectional datasets. Without longitudinal research we do not know the extent to which heavy smokers were reducing consumption or were quitting completely. Further work using the BHPS may be able to shed light on this. The Stop Smoking Service data available was four week quit rates. In general 6 or 12 month quit rates are preferred [181] but they are not routinely collected. In addition to the datasets we were also limited by the statistics available. We would have liked to have used ordinal regressions to analyse smoking status and consumption. However due to the distribution of categories we could not obtain odds ratios.

Ideally we would also have made more use of the GHS survey which has larger sample sizes and a more precisely stratified sampling frame than the HSE. As sample

design information was not made publically available we could not do this. We discuss these problems in more detail in section 3.5.2.1 below.

Data were not available at a more local level than region whereas Primary Care Trusts and even individual Stop Smoking Services have some freedom in the way they prioritise their resources. In future this may be even more significant with the reorganisation of the NHS and SSS (see also section 5.2.1 below).

3.5.4.1 Data issues

The unreliability of the available data sources to provide estimates, even at a regional level and despite three year data smoothing, has already been alluded to. Compared to the HSE, the GHS showed more decline in low SES groups prevalence, no indication of increasing smoking rates in the South East and East Midlands and no markedly high smoking rates in the North East.

Part of the difference between the GHS and HSE results could be from differences in sampling frame. The GHS is stratified by geographical area, car availability, socioeconomic group and proportion of pensioners whereas the HSE is stratified only by local authority and NSSEC. Thus the GHS is more precisely stratified for analysis where SES and age are of importance. However the GHS had other problems.

There were particularly concerns about the GHS dataset. GHS data that would enable the precise calculation of regional standard errors are not released. We recommend that strata and PSU information is released for public use in future editions of the IHS datasets. Furthermore since 2005 the GHS has included a longitudinal component which limits the number of independent cases. To maintain sample size and on the recommendation of ONS documentation, the GHS data in this report were analysed as if all observations were independent. We recommend that that more documentation is supplied with the dataset on the implications of the longitudinal element and strategies to deal with it. There have also been some inconsistencies between years over whether proxy interview cases were excluded from the smoking variables.

Throughout the period of the analysis (2001-9) both the NHS and Stop Smoking Services were linked to the English regions in their organisation and structure. Thus regional analysis is logical. Following the election of the Conservative led coalition government in May 2010, reform is now underway which will result in public health, including SSS, being administered by Local Authorities whereas the regional and sub-regional structure of the NHS is likely to be dismantled in favour of GP led consortia. Furthermore, Local Authorities are being encouraged to merge services which could lead to several local authorities cooperating over SSS. The GP consortia may well vary greatly in size and their longevity and stability is of course unknown. Therefore in future analysis region is unlikely to be so appropriate. However current data is insufficient even for analysis by local authority [182]. Nevertheless it will be perhaps even more important that sub-national analysis is undertaken so that the impacts of the structural reorganisation and any macro-economic factors, such as recession, can be understood and, if necessary, acted upon.

Given that GPs are a major referral source for SSS, it is important that both the new structures of SSS administration and GP consortia are available to national surveys as

and when they come into being. This is unlikely to be a simple task given the insufficiencies of survey data even at a regional level.

One of the main findings in this analysis has been that London is different in terms of prevalence, cessation and consumption from the other English regions. Much, but not all, of this difference can be attributed to the higher proportion of ethnic minorities in London. With the likely future growth in England's ethnic minority populations [183], other regions may come to more closely resemble London. However, because it is unlikely that ethnic composition is the sole explanation we recommend that London's distinctness is taken into account in future work.

3.5.5 Future research

In some ways this analysis has generated more questions than answers. We feel that more research would be helpful to explore the following findings in particular:

1.) The decline in the proportion of quitters in the population and the rise of the never smoker

Is this completely explained by the increase in the proportion of ethnic minorities without cigarette smoking traditions or is there a drop in smoking uptake?

2.) There may have been a recent decline in quitters and quit attempts from 2008 onwards

This trend needs to be confirmed and if necessary explained and policy action taken to reverse it.

3.) The proportion of heavy smokers has declined

In cross-sectional research it is not possible to test whether former heavy smokers have quit completely or reduced consumption. Teasing out whether one of these paths dominates, perhaps using BHPS data, is likely to be important for future policy.

4.) Smoking is concentrated among the multiply deprived

With each extra indicator of low SES the chances of smoking accelerates. Nearly two thirds of the multiply deprived smoked. This has implications for targeting policies. Finding smokers among those groups will be easy but gaining successful quits will be a struggle.

Further research could estimate lives saved and quality adjusted life years gained if the multiply deprived smoking rate of 60% could be reduced to the 15% of those with no indicators of low SES. Sweden and US have, however, already achieved reductions in smoking so that their population average is 15% or below [184]. Thus even though this would reduce inequalities we advocate that tobacco control measures are still needed in all England's SES groups.

3.5.6 Summary of statistical analyses findings

Inequalities in smoking prevalence, consumption and cessation exist in all regions. Findings on trends on inequalities differed with the data source. In future we would recommend that sample design indicators are included with all clustered datasets and that sub-national data is collected with large enough sample sizes to be able to draw robust conclusions. Due to the major changes in the geographic organisation of the

NHS and SSS, government office regions may become less appropriate boundaries. It is important that surveys keep up to date with the most useful geographical boundaries to enable aggregation into regional and other configurations to allow long term trend analysis, even after the regions have gone.

4. TACKLING SMOKING AND INEQUALITIES AT THE REGIONAL AND LOCAL LEVELS IN ENGLAND

4.1 Introduction

4.1.1 Background

Over the past decade tobacco control has played an increasing role within the public health agenda. Regional Tobacco Policy Managers (RTPMs) were employed by the Department of Health to take a strategic lead on the smokefree legislation and to provide support to Primary Care Trusts (PCTs) and tobacco alliances within their region. They were typically based within regional Department of Health offices working within the Public Health teams. In the lead into smokefree legislation and post-legislation there was an increase in Department of Health funding to tackle tobacco; particularly in areas where prevalence was higher than the national average. This meant that some RTPMs were joined by other support staff such as Regional Performance Management Leads and Communication Managers.

In 2005 the North East RTPM launched a collaborative project with their funding from the Department of Health in addition to funding from each of the PCTs in the region. The general aim was to establish a regional 'office' for tobacco control to enable the region to give greater presence, support and resources to PCTs than they would have had independently. This model was followed in 2008 by the North West team and 2009 by the South West team. These three teams all had contributions from the PCTs and developed separate branding from the Department of Health and NHS. Although they had Department of Health funding and responsibilities, they had additional capacity to campaign and run projects through PCT monies.

This study was carried out at a time of increasing insecurity for regional and local teams. The change of Government meant a shift from the existing regional structures to local authority level with the disbandment of the PCTs, regional SHAs and regional DH offices. This ultimately meant that the Department of Health funding of the regional tobacco teams was cut. Thus teams that relied solely on this funding were at risk (the teams with PCT funding also lost this funding but had another source of revenue for 2011/2012). Within several teams members of staff retired, were pulled back from secondment, or faced voluntary redundancies. Many other staff had left to move into other more permanent positions. At least one regional team would no longer be functioning after March 2011, and another had been absorbed into a wider "Healthy Lifestyle" team.

4.1.2 Aims

In order to understand current tobacco control policy and practice at the regional and local level in England, this part of the project explored what data are available to inform local and regional decision-making on tobacco control and inequalities. It also aimed to critically assess how useful these data are at regional and local level, taking into account recent developments, such as the Integrated Household Survey and the Association of Public Health Observatories' (APHO) new smoking toolkit.

This study addressed Objective 5 and part of Objective 4 of the overall project:

4. To provide a review of what is known at the national (England) and local level

on patterns and trends in adult smoking in different social groups and to use this review to suggest ways of improving data collection to allow commentary on the impact of tobacco control on smoking and inequalities.

3. To describe how tobacco control policy and practice is developed, managed and monitored at regional and local level (eg. PCT or local authority). This includes:
 - Cessation services
 - Compliance with smokefree legislation
 - Compliance with tobacco sales legislation
 - Smuggling
 - Local media campaigns
 - Work on smokefree homes

4.2 Methods

4.2.1 Sample

To understand how inequalities and smoking have been tackled at the local level, interviews were undertaken with tobacco control leads (7), or their representatives (2), from each of the 9 regions, and asked them to recommend one or more people we could talk to who were active at a local level. Through the regional leads we successfully contacted a further 9 people working at a local level and 11 people subsequently took part, as one discussion involved three participants in a conference call.

4.2.2 Interviews

The semi-structured interviews with all 20 participants took place by telephone, and calls ranged from half an hour to over one hour in length. A copy of the schedules used with the Local Leads and Regional Leads are included in Appendices D and E. All interviews were audio-taped with the consent of the participants and transcribed. As a service evaluation, this work did not require formal ethical approval. However in line with good research practice, an information sheet was developed to clearly outline the aim and objectives of the work and emailed to participants in advance of their interview. Participants were asked to sign consent sheets indicating that they had read the information sheet, knew that the interviews were being recorded, and that they were happy that what they said could be included in this report and any subsequent publications. In addition to the telephone interviews, a number of participants followed up with further emails, and attached any documents that they had mentioned in the conversation or further material that they believed would be useful to the study. The interviews took place between September and December 2010.

4.2.3 Analysis

The qualitative interview data were analysed inductively using thematic analysis, which related to the study objectives.

4.3 Findings

4.3 1 Structure and content

After an overview of the meanings people ascribed to ‘health inequalities’, to provide a critical review of what is known at the national and local level on patterns and trends in adult smoking in different social groups, findings are included under the following headings: (1) What sources of information are used to understand patterns and trends of adult smoking in different social groups, at (i) the national level (ii) the regional level and (iii) the local level?; (2) An overview of the development, management and monitoring of tobacco control policy and practice; (3) How can data collection be improved to increase understandings of the impact of tobacco control on smoking inequalities?

As participants working at the regional and local levels at time used the same sources of information and at times raised similar issues, the views of both local and regional leads have been included together rather than repeat the issues. However, it is indicated when issues were solely mentioned by regional leads or by local leads. After direct quotations, RL is used to indicate a Regional Lead, and LL a Local Lead. To ensure anonymity, any identifiers have been removed from the directly quoted text, including locations or names of identifying organizations.

4.3.2 Understandings of health inequalities

All participants were committed to the idea of specifically tackling health inequalities through action on tobacco, however only a minority commented on the lack of evidence to show how this could be done. Further comments indicated that their aim was as much to halt the increasing gap in the health of the rich compared to the poor before thinking about how to reduce it. Some were concerned that the gap could widen within the next 5 years if tobacco control work was not sustained:

‘... if we don’t push ahead with a comprehensive tobacco control strategy now we may well look back and have widened the inequality gap, you know, with more affluent smokers to stop and those more addicted find it harder to stop [and] we’ve just lost them’ RL

However, participants’ approach to the issue of health inequalities varied. Although all agreed that health inequalities were a real and pressing issue for everyone working in health and health care, for some, this meant carrying on with work on tobacco control in all areas, rather than taking up particular issues, or targeting particular issues:

‘We don’t target projects around health inequalities, we work on the principle that anything to do with tobacco control is in effect, addressing health inequalities’ RL

Some participants who believed that tobacco control was key to reducing health inequalities, as smoking is directly related to health inequalities, saw their core task was to continually improve the performance of the smoking cessation providers in their areas; looking for new ways to encourage people to engage with those services; and to keep tobacco high on the wider political and health agenda by maintaining and supporting regional and local tobacco alliances, sometimes through a network of stop smoking service commissioners.

In contrast, in other regions (and therefore some localities) participants believed that health inequalities could only be reduced by adopting a diverse and co-ordinated approach to tobacco control. The success of the campaigns to de-normalise of tobacco use in California was consistently cited by these participants as evidence of the possibilities that real success could be achieved through attempts to change social and cultural norms around tobacco. Some linked this explicitly to the need for comprehensive tobacco programmes to be developed. Advocates of the broad approach to smoking and health/ social inequalities described how as well as improving smoking cessation services and mass-media campaigns, they acted more strategically by targeted the most disadvantaged wards in specific geographical local areas where smoking prevalence was known to be high. These areas variously received more or enhanced services, were targeted for the provision of information and advice often through social marketing campaigns and became pilot sites for reward schemes/incentives linked to cessation services.

These varied ideological approaches to smoking and health and social inequalities had a direct impact on the ways in which local and regional strategies were developed, how evidence was interpreted and used, and on how guidance was implemented.

4.3.3 Understanding patterns and trends of adult smoking in different social groups

4.3.3.1 Using national level data

The majority of regional and some local participants were aware of the summaries provided by the General Household Survey (GHS). Smoking and Drinking Among Adults was cited as a key source for identifying smoking prevalence among different SES groups, although those working in regional roles were more likely to have read it than those working at a local level. Participants also referred to the Health Survey for England (HSE) as a possible source of information, and some had found the Smoking Toolkit Study useful.

'...to show impact of interventions, the lag is unhelpful because you can't definitely show. I mean Robert West's Toolkit study is really useful from that perspective because you don't have that lag, it's much more immediate' RL

However, all participants were critical of the time lag between data collection and publication. A time lag of years meant that the information was out of date by the time it was published, with a wait until the next cycle.

'I know that people in the region will not always feel that when this data is published, that it is very reflective of where we are now, because you know it is 3-5 years out of date... I think there is something about the timeliness of data... as some of the big national datasets you know already have a 18 month sometimes 2 year time lag and when the sample sizes at local or regional level are so small you need 3 years worth of data aggregated in order to do any further analysis, that is not helpful' RL

The sampling of relatively small numbers from large geographical areas made it very difficult for analysts to 'drill into' the data at a local level, and so participants felt that it was only useful to discuss trends at a regional level. Therefore it was referred to, because that was all that they had. Only a few people mentioned Smoking-related Behaviour and Attitudes (ONS). However, some of the key findings from the ONS,

such as the need to work with routine and manual workers were mentioned, indicating that the data from this were widely circulated through the publications of strategies and other documents, even if the original reports were not actually read.

While people working in regional offices said that they were aware of or occasionally read all or most of the sources mentioned above, they were not necessarily routinely referred to. Other sources *information*, such as NICE Guidelines, ASH summaries, the NHS Stop Smoking Services in England (NHS Information Centre) publications and White Papers were more often used as a source of *data*. That is, the summary statistics included within these documents were ‘lifted’ and used in regional and local documents, without returning necessarily to the original source, which may not have been cited in these summary documents. There is therefore an issue about sources of ‘data’ and the way in which information may be ‘filtered’ from one document to another and from one organisation to another.

Some regional leads used other sources of data, including the YouGov survey to compare to GHS data to understand issues and inequalities and, as there was no single reliable source, used a mixture of sources to provide the best possible evidence.

‘Because there are problems with all of them, we don’t tend to focus on a single one, for one project, we look at several different sources’ RL

More widely read were the documents produced by the Department of Health to support their strategy and also the White Papers on tobacco control. Summary reports prepared by ASH were also well received by participants who found the summaries and key statistics useful. These documents included referrals to some sources of data (ONS, HSE, GHS), or just included data as summary statistics, graphs and tables. This was used to by participants to directly influence their interpretation of the strategy and their decisions as to how to implement it in their region/ locality. Other participants found the smoking prevalence data provided quarterly by the Information Centre (IC) very useful as it allowed them to compare the performance of different services working in different localities.

4.3.3.2 Using regional level data

Neighbourhood Statistics: Model Based Estimates of Healthy Lifestyle Behaviours at Local Authority level 2003-05 (NHS Information Centre, 2007) and Healthy Lifestyle Synthetic Estimates, Neighbourhood Statistics, 2007 (ONS) were used to inform past strategies. Local health profiles and statistical work produced by some of the regional offices and Strategic Health Authorities (SHAs) were useful in some regions, and depending on their focus, could provide useful data to support their planned work.

‘Yes, we have got good support here in terms of looking at the data, in terms of the sort of analyst functions we have here and at the SHA, and the SHAs do quite a lot of analysis certainly on the information that we get from the IC [Information Centre] every quarter with the stop smoking information’ RL

The additional work provided by the SHA was useful to people working at the regional level, although some of the data required were harder to get hold of as they were collected at different times and places, and held in different areas. In order to ensure that there was a match between the data provided and the key priorities of

regional tobacco control, or just to inform their thinking about some issues, some regions had commissioned specific pieces of work to improve the quality and relevance of the available data.

There were underlying issues around the interpretation of data, as SHA reports were not always accurately interpreted at regional/local level because they reported a range of different conditions using different measures for each condition, rather than summary statistics. For example, 'death rates per 100,000' could be (mis)interpreted as the number of deaths. This meant that people working at regional and local levels often requested reports from one or more public health observatories (PHO) to help clarify issues and to present the data in a way that could be compared and used.

'..we have actually to commission a number of reports from the observatory because the data wasn't very accessible, it wasn't very accessible to the local level... when we are looking at the impact of smoking on health obviously it has a huge impact on a wide range of conditions or illnesses... so you have a got a report on cancers and you know it highlights smoking-related cancers separately and even separating out lung cancer.. is not necessarily helpful ... you know there are often a number of other cancers that will be sitting alongside lung cancer and you know, disaggregating the data and really deeply understanding the data is something that feels quite difficult' RL

There was a concern that regional smoking prevalence figures did not adequately reflect the smoking issues in the region, and were even unhelpful as they clouded some issues. For example, two areas with low smoking prevalence felt that such figures could make partners complacent, and fail to support tobacco control policies.

'I think if you asked them [Health leads in the region]. they would say, "yes, tackling smoking has always been a priority" but the way they have gone about it has been focused on the Stop Smoking Services and just to try and get the 4 week quits through and I suppose because prevalence rates have always been so low.. so that's where having a low prevalence doesn't really help.' LL

Some participants were aware that the low prevalence figures for their regions was a reflection of the balance of social, cultural and economic diversity in their areas, where higher proportions of non-smoking affluent people masked the smaller areas where smoking levels were very high.

'... the only problem is there are large assumptions made... [name of area] on paper it can look very good in the sense that it has very little deprivation , we have got low smoking prevalence rates, and the ONS data sort of supports that, but then we have got pockets of deprivation where we have much higher rates of smoking prevalence and that is sometimes hard to drill out of the data... and that sometimes makes it very difficult to direct funding or work into an area if we just use ONS data' RL

In some urban localities, there were concentrations of disadvantage that made it easier to 'target' these populations, unlike more scattered populations in rural areas, where large geographical areas included affluence as well as poverty. Some local leads commented that the relationship between disadvantage and smoking was not

straightforward for non-white populations as some BME are disadvantaged, but smoking rates may be lower, and so they rely on local data about smoking. Participants reported that ethnic diversity provided them with particular challenges when monitoring trends and providing services. In some major cities, particular needs could vary dramatically over small areas, with different ethnic groups tending to cluster in localities, which could mask or distort other trends. For example, a number of Regional Leads referred to the ‘hidden’ practices of chewing tobacco or smoking through water by Bangladeshi women that were masked by ‘smoking surveys’ that only picked up smoking prevalence in men.

‘With a large group of Bangladeshi immigrants or first or second generation descendants living in the areas where we are given the impression that women don’t smoke and don’t have any form of tobacco use, and do, but often they are chewing tobacco rather than smoking it. The closer you get to the community, the more you realise that there is a lot of covert tobacco use going on, especially among women at home.’ RL

Another issue was that across a region, the areas of high ethnicity could be relatively small, and so the Regional Leads did not always feel that they could develop this area as a strategic priority as it was not representative of the needs of the wider population.

While targeting areas where smoking was known to be prevalent (i.e. by geography and income data), in other regions priorities were set using occupation (responding to the need to reduce smoking in Routine and Manual occupations), health status (smoking in pregnancy) and a combination of demographics, for example smoke-free homes schemes to protect children from tobacco smoke. However these issues, often articulated as means of tackling smoking inequalities, were decided on as issues, and then data were used to support the ‘Business Case’ for tackling them, rather than data on inequalities driving the tobacco control agenda.

Some regions had set up their own additional surveys to enable them to collect data annually to compare localities and data year on year. While they reported some initial resistance to the idea from the health and social care professionals required to complete the surveys, the value of the additional data was more clearly seen in later years and both return rates and the accuracy of returns was reported to improve year on year.

4.3.3.4 Using local level data

To identify disadvantaged populations with high levels of smoking, participants used information provided by the index of multiple deprivation, and in some areas, local lifestyle surveys provided the most up to date information. Health equity audits were also cited as useful ways of making links and identifying priorities as well as checking that services were targeting the people they intended to, but not all areas had carried them out, and not year on year. In areas where no ward level data were available, there was a reliance on QOF from GPs and data from practice visits and performance management to give local intelligence about smoking rates in an area. However, other participants were very reluctant to use GP data and they felt it was inaccurate and therefore unsuitable to be used for understanding smoking prevalence at local levels.

'That [GP Data] varies substantially, some of them are quite good but some of them are appalling frankly!' RL

'It's patchy and different across the region. So for instance in [name of county] ... their service has great referral rates from there but they are primary care providers and the GPs are brilliant... whereas other areas are just, they just can't engage.' RL

Few participants were satisfied with the quality and level of data available to them to plan and deliver services to tackle health inequalities at a local level. Even local lifestyle survey data could produce small numbers at ward level, and were unlikely to be repeated year on year.

'We also commissioned in this region a LifeStyle survey in 2008/9 to look at monitoring prevalence more robustly and that also drilled down, looking at 80% and 20% most deprived ... which again is really powerful to give to local areas to use and for us to use with local areas as well. Unfortunately it is too costly to continue so we have these two year snapshots which you know were useful at the time and are useful to a certain extent now, but we won't be able to continue with them.' LL

This meant that most regional and local leads were reliant on synthetic estimates from their local public health observatories, and rarely interrogated raw data themselves.

'I am slightly sceptical [of Public Health Observatory data]. I think the data is either so out of date or based on guesstimates that it is not all that helpful' RL

Participants working at a regional level and most local leads were eagerly awaiting the Integrated Datasets from the General Household Survey as they were concerned about the local data.

'... the PHO has looked at all the other local data that are available, at PCT level, and they have done a best guessed or best estimate of smoking prevalence at PCT level looking at the General Household Survey as well as the local data ... but as the PHO have indicated, a lot of the local data is not reliable or valid, and you know a soon as we get more, better data at local level then that will underpin what we are trying to do' RL

In terms of the gaps in local research evidence, it was felt that there was no available evidence on the local populations that they were trying to reach:

'One of the challenges is understanding the communities that you want to reach through your intervention and having good access to local data and being able to target interventions effectively.. having those local tobacco commissioners in place within public health at a local level provides a much more detailed picture... I think it is very helpful to have a broader insight into the lives of the people whose behaviour you would like to see change... you know understanding the commonalities and similarities of what might motivate these people to change their behaviours.' RL

'... there has been a real need to translate the information into local areas... without that I am not sure how useful the reports or the research would have been... by actually being able to talk about individual localities, streets, the sort of population

variations that you are going to get from one area to another, that is then made it far more tangible to the people who are doing the work on the ground.’ RL

Rather than accessing the wider (academic) body of social and behavioural literature around smoking behaviour, people working at a local level tended to commission (or undertake) their own research. The insight work they commissioned using social marketing companies was regarded as a valuable form of evidence, presumably because it was up to date and conducted in their local area directly with the populations they wanted to target.

4.3.3.5 Using data from other sources

Given that some participants were aware of a lack of national data and also felt that there was some work to be done in translating guidance and recommendations into actions that would reduce smoking and so health inequalities, participants had developed alternative and innovative sources of data and intelligence. In addition to the local sources of data, some participants were able to draw on data from partner organisations, such as local government, the fire service, and trading standards. Relationships had often been formed during the campaign for smoke-free legislation and many alliances continued to meet and discuss tobacco and smoking on a regular basis.

However, others reported problems trying to access these sources of data. This was because either the boundaries of health and local government were not coterminous and so data were hard to break down, or access was denied to them on the basis of confidentiality and data protection, even though the data they hoped to access was anonyms.

‘We regularly get feedback on the confidentiality one, I mean even trying to get information shared between an acute trust and a primary care trust is an interesting barrier. That said actually it is a bit like when people quote health and safety laws, when you really get into it, and you get a good understanding the barriers aren’t quite as significant as they are identified by people... but they actually stop an awful lot of work’ RL

Participants also reported using informal knowledge from local service providers, particularly if they lived and/or worked in particular localities where they needed good local knowledge.

4.3.4 Information and data sources used to inform the development of tobacco control policy

4.3.4.1 Using guidance as data to inform the development of tobacco control policy

Participants tended to rely on the published guidelines from NICE and any supporting information from the Department of Health. These sources of information were valued for three key reasons: firstly, endorsement by key agencies; secondly, because they provided a summary of the evidence; and thirdly, because they offered advice as to how to translate the evidence into practice.

‘What we do use is NICE Guidance and we follow that and we expect the services to follow that as closely as possible’ RL

However, what was evident, as mentioned in the previous section on data sources, was that for many participants, the NICE Guidance was used as a source of data, and so the summary data included in their reports was used in preference to the original sources:

'We can set out our business plan... and we haven't had to at this stage make a big business case for these pieces of work because they come out of our routine annual regional budgets... we will have used you know, bits and pieces of data from NICE and things like that but not, we haven't had to make big business cases to be able to do these pieces of work luckily' RL

As NICE and Department of Health publications were endorsed at government level, this removed any concerns about the quality of the data in the reports and guidance and so these sources were most likely to be used and quoted.

'In terms of making cases for the big picture level, definitely, and NICE Guidance is really useful. You know people listen to that, people will take note of it and they are really helpful.' LL

Other bodies such as ASH, Cancer Research UK, and Royal College of Physicians that produced summary reports of issues, were also mentioned as good, reliable sources of data. Understandably the majority of participants were unsure how to critically review the literature eg. unaware of the 'hierarchy' of journals, and reluctant to critique 'published evidence' in journal articles. A related issue appeared to be the acceptance of 'reports' as published literature, rather than grey literature, as they provided strong local data. So the guidelines and reviews were critical in 'bridging' the gap between academic and clinical work and practice, and enabling ways forward. It was recognised that it was important to be seen to be following NICE guidance as this provided useful 'leverage' with other organizations.

These reviews of data and evidence, such as NICE, enabled a rapid reading of a wide area for people who were time pressured. Time was cited as the major reason why people didn't consult the literature regularly, although some did read widely and keep up to date with published literature.

'.. we use the guidance, service and monitoring guidance....so we use a lot of the DH guidance, the NICE guidance that comes out, the 10 high impact changes, and get a lot of information from DH' LL

Access was an issue for some, who said that they tended to reach for tried and tested sources of information rather than undertake a full search before deciding on a particular course of action. Others said that they preferred to undertake reviews only when they felt under-confident in an area, or when it was a major undertaking for their service. One participant mentioned that taking part in a research study was a useful way of accessing research information about a topic. Otherwise participants relied on ASH daily or weekly bulletins and NICE and Department of Health guidance as key sources of information. The NICE alert system was used by a few participants, but others tended to wait for information to cascade down to them, particularly those working at a local level.

One participant cited the importance of feeding into the development of any NICE guidance to make sure the guidance reflected local issues, which in turn aided the eventual interpretation of the findings. As a result, some participants were able to tap into well known existing forms of evidence.

However, the NICE Guidance was not accepted uncritically by other partners. One participant working at a regional level reported that some PCTs queried the validity of the source:

'We have had problems with NICE guidance in some respects because some of the PCTs do not see them as, erm, valid guidance so for example, regard to the NICE guidance around smoking in pregnancy and reducing smoking in pregnancy there is some resistance in some areas to taking that forward.' LL

Cochrane reviews were known to most of the participants and mentioned as a potential source of information, although only a few participants consulted reviews regularly and read the wider research literature.

'Cochrane is very valid, and also we use a lot of international data' RL

Others had never looked at the reviews, and some had only looked at specific subjects when they had decided on priorities to support a particular stance or aspect of service provision, and some not at all.

'I wish I could say that I consult it originally but I think it is when I need information to back up an argument I am making, or a paper I am putting together, then I will go and look.' LL

While a few people stated that they spent time searching for evidence on particular topics, particularly 'hard' evidence, the consensus seemed to be that reading scientific reviews and assembling evidence was not only time consuming but not required for the development of strategies and reports, so was often was not done at all.

The annual statistics on NHS Stop Smoking Services in England (NHS Information Centre) were regularly used to make a case for the introduction of a particular service. These data based on quarterly returns from smoking cessation services were regarded as up to date and also reliable and meaningful to key partners elsewhere in the NHS and so most likely to inform their thinking. One participant also cited the Smoking Cessation Research Network as a useful repository of evidence and information.

4.3.4.2 Using networks and informal sources to inform the development of tobacco control policy

Participants commented on the importance of information sharing at meetings or conferences to help them think about which issues to prioritise in their own local areas or regions.

'We are in contact with one of the London boroughs because they have high BME communities there so they have come here and helped support us and given us some

advice and guidance and vice versa you know the services come here to sort of look at our services.' LL

In another example, a participant talked about their motivation to work on illicit tobacco as coming from conference presentations and conversations about training/ evaluations/ campaigns rather than from any published research evidence. They then fed this back to key partners and key stakeholders and decided to introduce something similar in their own areas. Therefore the chance to meet up with other service providers at meetings and conferences has formed an important means of sharing and finding out about best practice, and demonstrating the ways in which informal communication of information were at times preferred to more formal consultations around research evidence. However, opportunities to meet and share good practice had already been lost as there were no longer the same resources available to fund meetings and travel.

4.3.5 Using Evidence, Information and Guidance to inform specific initiatives

The following section reports on how participants discussed their use of evidence and guidance when developing tobacco control activities in their regional or local area.

4.3.5.1 Cessation services

Both regional and local leads commented on the different methods of commissioning stop smoking services. Some used GPs to deliver, others used PCTs (usually the Directors of Public Health) to commission the services from social enterprises, private companies or charities who offered the service. The management of the policy by the Regional Office was concerned with working with the organisations responsible for managing the performance of the services, working most closely with services who failed to meet their targets, particularly the four week quit target. This involvement included visiting those services and meeting key people to find out any specific barriers that they were facing, although one regional lead concluded that what they often found was a variation in practice from one service to another. For example, some PCTs spent more money than others on the service, with an example of one PCT spending four times the amount than another PCT with a comparable population. Generally there was a lack of understanding of the needs of their local populations in terms of smoking rates, where people lived, and whether there were any additional needs such a language or culturally sensitive advice.

Some ethnic minority populations were regarded as 'hard to reach' and, as mentioned earlier, the lack of reliable smoking prevalence data and/or data on tobacco use for ethnic populations made creating regional policies and developing services more complex. Some stop smoking services working with high concentrations of ethnic minorities employed people with specialist language skills to work with people from some ethnic groups who were often scattered across the urban areas.

Smoking cessation data were seen as a very robust and useful means of monitoring the performance of the service, particularly if validated by CO monitoring, although more work was needed to support rigorous audit and evaluation. Participants cited the Department of Health guidance around monitoring services as useful, but some felt that there needed to be a greater understanding of what motivates people to quit and

how services could be best configured to support that outcome for the highest number of people.

'.. there doesn't seem to be a correlation between what they [services] spend and how successful they are either. You know it is not about lack of resource always.' RL

While some smoking cessation services were required to target people from more disadvantaged backgrounds, recorded as their postcode, some concern was expressed that this emphasis may not continue in the future. There was also a need to invest in systems that can effectively enable people to interrogate smoking cessation databases (North 51 and Webstar were mentioned) and to compare service to service from area to area to ensure that smokers trying to quit are offered the best service. In particular, ward level data was consistently cited as a desirable feature of any future system. One participant hoped that the new tariff system for providers of smoking cessation services would lead to the inclusion of more people from disadvantaged groups, as they were paid more if they managed to include them.

Many participants expressed concerns that the current level of support that smokers are given to quit smoking will decline under the new government. They believed that this would threaten the trends that had prevailed and the work around inequalities.

'If we don't continue with this core service, NHS Service at the moment... we are going to increase inequalities in effect... There might be more people accessing the service so the data will show a massive improvement ... but how long are they going to stop smoking for, is it going to be maintained and are we going to get quality service provision? RL

4.3.5.2 Compliance with smokefree legislation

This was still an important area for participants, although their main involvement had been in campaigning for the legislation and getting it adopted, while some had a lighter touch involvement, mainly working with local government to get it adopted. Some reported working on the issue with local government, but because of reportedly high compliance levels and shifting priorities, they were not particularly active in the area.

'The message I get from the local alliances who work with local authorities is that for local authorities at the moment policy is just not a priority... and that was sort of shown in the numbers that went to Smoke Free Legislation Refresher training' LL

Shisha cafés were an issue for people in some areas, particularly as smoking tobacco through shisha pipes is articulated by proponents as a cultural and religious issue that makes it more challenging for local and regional tobacco leads to get involved. However, closer working relationships with religious and community leaders were regarded as having been successful, particularly during Ramadan when they have had joint campaigns to reach the local population.

4.3.5.3 Compliance with tobacco sales legislation and smuggling

Work around illicit tobacco was cited as an emerging issue for a number of people, who were more likely to be working in areas around ports on the East and South coast. However, it was recognised by participants that illegal cigarettes (counterfeit

brands or duty-free cigarettes) were quickly moved around the country and came in through airports and so was an England-wide issue. Similarly the sale of cigarettes to children under 18 years of age was a key issue across the country and all the issues around compliance with legislation were identified as something that required partnership working with the police and trading standards. However, such partnership working required investment, as some regions have appointed people from trading standards to work with them on key issues, or seconded a tobacco control worker to work with, or liaise closely with Trading Standards.

There were also issues surrounding sharing information, such as the confidentiality of data (see 4.3.3.5, and so participants lacked any meaningful data about the full scale of the problem. Other issues were around enforcement, as it was accepted that enforcement agencies couldn't be everywhere, although most participants felt that there was more that they could do with more resources. One participant described a collaborative enforcement action with the police and Trading Standards around illicit sales of cigarettes and voiced their concern that while this had resulted in the problem being erased from one area, it had simply relocated to another area. There was also a feeling that the effort that was put into enforcement of the under-age sale legislation was not backed up by the law, as warnings to traders appeared to be ineffective in some cases, and any fines awarded as the result of legal action were unlikely to deter vendors from future offences.

4.3.5.4 Media campaigns

All participants agreed that any comprehensive tobacco control strategy needed to involve some form of mass media campaign. However, they were divided as to whether national campaigns should be promoted in their local region, with some additional 'spin' to make it relevant to their local areas, or whether to produce campaigns and materials based on their local issues, drawn from local data. For some participants, the research involved in the production of the national campaigns meant that it was a cost effective and valid campaign to promote and they used the associated materials.

'... the evidence indicates that by maximising the national campaign you will get a bigger return on investment so we, all our effort is aimed at maximising what is going on at a national level and so we use the national branding and promote the national resources.' RL

In some areas, participants used the national campaigns and materials and took advantage of the offer of an attached Marketing Manager from a company employed by the Department of Health to develop their marketing strategy that involved mapping issues across targeted areas.

'We would take the national stuff and regionalise it rather than, we haven't done any big kind of social marketing studies and developed our own campaigns like I know they have done in the north... we've very much taken on what has been developed nationally and then implemented in priority areas.' RL

Some of the 'in house' marketing was preferred to using the national campaigns, as some participants believed that it was not always applicable to the local areas,

although at times it was combined with the national campaigns to maximise the impact:

'...as a service we do use all of the DH campaigns, we run with their campaigns, but we thought we might try and do some specific targeted work around the campaigns that they have designed, so we are going to use both but we are going to drill down into those areas.. to target the routine and manual areas, the BME communities with these local campaigns... because they are the sort of language that local people use' LL

Small scale regional/local campaigns sometimes avoided using the NHS logo which was seen as 'alienating' some audiences and gave their campaigns additional 'reach' across organisational boundaries. Some local initiatives also avoided contact with their regional office, which could 'hold you back a bit'. Most participants mentioned the importance of involving local media as well as national to reach the audiences they want to reach. A number of regions developed a Marketing and Communications strategy as the mechanism to deliver and promote their smoking cessation services, and this was targeted towards specific groups where smoking levels were known to be high.

'.. the visibility of messages at a local level is important but the coherence of messages in mass media and on-line...is increasingly important....as a way of twisting social norms as well as motivating changes in behaviour' RL

Other participants working at regional and at local levels had developed social marketing initiatives by consulting with local people (community leaders) and 'adding value' to national initiatives by making them locally and culturally relevant. This was done by variously using research commissioned from universities, insight work from local agencies, or developed 'in house' by the regional/local tobacco team who used their knowledge of the local area.

Some participants mentioned the importance of involving local and national media in the work that they were doing, to continuously promote the services and any new information available to them. Publicity for the issues was often via human interest stories which were used to promote the success of some services, and in terms of health inequalities, to reach particular audiences.

We use a lot of local case studies, we also show case a lot of the real people who run the services as well to try and de-stigmatise it and to get it away from being clinics and medical' RL

4.3.5.5 Work on smoke-free homes

Some Regional Leads had not initiated smoke-free homes projects in their region, as they did not believe that there was sufficient research or evaluation evidence as to their effectiveness, or they had limited influence over what was taken up in their local areas.

'One of the challenges in the UK is to get better at strengthening the UK evidence base for some of the tobacco control work. So, whilst we have work from NICE and Cochrane reviews, which obviously around some areas like pregnancy and cessation,

there is quite a lot of really strong UK evidence ... other areas like smoke-free homes then we find ourselves turning to the international evidence base a lot.’ RL

While some regional did promote smoke-free homes initiatives, and local areas did develop their own smoke-free homes schemes, all were concerned that their schemes had not been well evaluated (or evaluated at all), and so it was hard for participants to convince other partners whether or not the initiatives had been successful.

4.3.6 Future changes: anticipating the challenges around the move to local authorities

4.3.6.1 Importance of training and development for passing on information to inform thinking

Training was mentioned by some participants as an important aspect of their work, to give people the best information and the skills to become advocates for, or key workers in, tobacco control and inequalities. Putting on training and events was important too, to improve knowledge and understanding and getting champions and ambassadors. One participant mentioned that people working in tobacco control and smoking cessation can get bored with doing the same thing and so the introduction of innovative working practices and service development and then training to support the delivery was important to keep everyone motivated.

‘We have spent a huge amount of time over the last 5 years to really get skills up around tobacco control, professional development... what makes effective partnership working, what makes effective advocacy.’ RL

However, there were concerns that reduced budgets would impact on the development of training and so reduce opportunities for information sharing and the development of innovative training to ‘refresh’ the work of practitioners.

Some participants described themselves as active advocates and campaigners, and believed that making ‘a lot of noise’ and continuing being known and ‘respected’ for their work in tobacco control would be key to their getting through times of change. Examples of activities in this area included always making sure they had a report in the minutes of corporate management and being seen to be active and performing in relation to key targets and priority areas. Some people were aware of their role in making sure other people received key information and evidence to make sure they were informed and so continued to prioritise tobacco:

‘... I cascade the papers I present, that I put together on the evidence around the short term impact on smoking prevalence to the Chief execs of the PCTs as well as the DPHs as well as our tobacco networks.’ RL

But there were concerns that good work was already being lost, and would continue to be lost as both statutory and voluntary services contracted and people moved to other posts.

‘...everyone is working at full capacity...and especially as we start to work more with community organisations and the voluntary sector, even more so for them. Short term contracts are also a barrier as someone does a fantastic piece of work and 18 months

later they have gone and the next person in post thinks, 'oh I must do that work' and it has already been done'. RL

4.3.6.2 Importance of personalities, leadership and environment in tobacco and inequalities

Personal characteristics were clearly important as participants described how they brought their enthusiasm and advocacy to their role, and that their dedication to tobacco control had meant that they had stayed in post, so providing continuity as other organisations have changed, and will continue to change about them. It was evident that participants were willing to use their knowledge and experience to do what they believed needed to be done to make their services more effective, particularly in areas where smoking rates were high. One participant commented that there needed to be an element of trust from the government level, through the regions to the local level as people needed to be able to get on with what they were doing. Other participants clearly valued the element of freedom and autonomy that their role gave them to develop ideas and practice in their region/ locality. However, there were concerns that if reducing health inequalities was not a priority for the new government, or to particular local authorities, then the wider tobacco control work would be lost.

The responses from some participants indicated that some were willing to take risks and so did not always follow the Department of Health or regional line as they needed to be able to add regional and/or local priorities to the national, and felt they knew what was needed in their local area. There was a concern that new ways of working with local government and anticipated increased accountability, coupled with substantially reduced resources, would prevent them from taking such risks in the future

4.3.6.3 Importance of partnership working at local, regional and national levels to develop tobacco control policy

More positively, many local and regional leads saw their role as providing 'leadership across boundaries'. They therefore invested time and energy in promoting links between themselves and other regional offices and also with other agencies whose work was deemed relevant to tobacco control and reducing health inequalities. In addition, some regional leads and people working at a local level were keen to make sure that any service delivery, specifically smoking cessation services, were also encouraged to have links with schools, colleges, health care providers as wherever there was a link, they would make it. In this respect, many local and regional areas had introduced working practices that anticipated the move of tobacco control, as part of public health, to becoming a local government responsibility.

'... there is a value in learning from each other in terms of what has worked well and elsewhere and how evidence, evidence based interventions have been applied and have been successful, or not equally, learning what hasn't worked I feel is just as important' RL

However, some localities did not have tobacco control alliances, and did not appear to engage with any form of partnership working:

'In some areas we have got really good partnership working relationships, across local authority, private sector and NHS and in another area we don't have those relationships' RL

The lack of engagement with local partners was seen to disadvantage tobacco control initiatives in terms of their reach and the effectiveness. Most participants reported having some problems in engaging with most GPs (with notable exceptions) and they were concerned that smoking cessation or second-hand smoke initiatives might not seem relevant to their practice. The general feeling was that GPs as a group, might need additional incentives (e.g. food, money) to attend meetings as they were in many ways independent from the NHS.

'I think a lot of GPs are not that interested ...many doctors I'm afraid feel that they are under such pressure that they don't have the time or the interest to commit to it' RL

Cross agency working has enabled links to be made with other issues, such as smoking and mental health or alcohol and/or drug use, poor diet, lack of exercise and so able to grasp the complexity of issues associated with health inequalities. Participants working in urban areas felt that the geographical proximity they had to people working in other areas gave them an advantage in partnership working.

'...we've had a situation where the Primary Care Trusts and the Local Authorities... makes for some advantages in terms of working across agencies, developing partnership approaches to tobacco control. So that's the advantage we have.' RL

However, participants were aware that tobacco alliances need funding and support and also needed a focus and cause to keep going. There were concerns that such collaborative working might not be possible in the future if some funding was not specifically allocated to the alliances and networks.

4.3.6.4 Local politics and the move to local government

Some participants alluded to the relevance of local political representation in relation to ideology but also the controlling government as an important issue e.g. health inequalities resonated well with Labour controlled local authorities, and less well in those areas controlled by Conservative councils. Local politics was thought also to be important with move to local government, as tackling smoking might not be popular with some councillors as not a 'vote winner' with their constituents.

'that [Local] data are is really crucial because you are talking to elected members, they want to know what's happening, often not just in their local authority areas, it's their ward, "It's my ward where I am representing people".' LL

'From the budget cuts that are going on, local authorities are starting to see smoking going down on the agenda, and PCTs are, you know, and also when we are dealing with our elected parliament you know, we do need to make sure we have got our MPs on board and that they can see in the big society tobacco and tobacco control and smoking are still really key issues.' RL

However, one participant did mention that there are issues about governance that need to be discussed in multi-agency working, such as who (which organisation) takes the responsibility if there are any problems? Such issues need to be articulated and resolved for multi-agency partnerships to be replicated elsewhere and for such work to continue. It was commented that all agencies have particular agendas and are working to their own targets, which can be good if an action meets everyone's targets but create issues if just one agency requires the support of other agencies to meet a particular target, or if everyone ends up pulling in different directions. Key areas where agencies come together are community safety and protecting children.

'I think it often comes back to this championing and the advocacy work that we have is so vital because it often it can come down to individual championing whether it is an elected member of parliament or a pharmacist or a GP, they don't understand the issues, do they care and do they want to champion us and support us?' LL

One participant said that they managed to keep tobacco high on local agendas by citing the clinical evidence for harm caused by tobacco rather than inequalities evidence, and this resonated more in affluent, rural areas where health inequalities were not so marked. However, most participants expressed some concerns about the future models of working, particularly if the forthcoming national strategies on health did not continue to prioritise tobacco and partners fell away:

'In the ideal world we would have much stronger partnerships. I mean, we have been developing some really good partnerships but they need to be more strong and the need to be more effective... we have got a mountain to climb in tobacco control and although we think we are doing very well in climbing it, doing it on our own or [as] a single organization we are never going to get to the summit, but if there is a whole group of people working towards that, that is going to be a far more achievable goal.' RL

4.3.7 How can data collection be improved to better understand the impact of tobacco control on smoking inequalities?

Whether they were working at the local or regional level, all participants clearly identified the need for good quality, up-to-date information around smoking prevalence and smoking behaviour. This would firstly enable them to understand who is smoking where, when and how much, and such figures should be available at a national, regional, local and at ward level.

'The magic bullets we are all trying to identify and that have difficulty understanding it could be measured, and how it could be funded is local prevalence data' RL

Secondly participants wanted to be able to link these data to detailed socio-economic and basic demographic data. Thirdly, they wanted to be able to use these data to effectively evaluate whether any tobacco control initiatives effect a demonstrable positive change on the most disadvantaged smoker's smoking behaviours, leading to improved health of smokers and people living with smokers (e.g. CO validated quitting). Due to the lack of local prevalence data, participants consistently mentioned their frustration at not always knowing who in which particular areas that they should target. Even if they did commission additional insight work or research that enabled

them to identify people living in poverty where smoking rates were high, they were at times unable to accurately assess the impact of the work they were doing to reduce inequalities.

'Data's a real problem and I think nationally we missed a real trick nationally over the last 10 years, you know we have had tobacco control strategies in place, smoking kills, and we've been really good and robust with our stop-smoking services and trying to measure them with our 4 week quit and we just haven't been on the ball with our prevalence measuring... I gave a presentation yesterday and you know the questions asked were 'How do you measure? How do you know that's going to work? How do we know what we've done before hasn't worked?'' LL

If they could develop their work using a common data set, then participants believed that would be easier for people working in tobacco control to compare the effectiveness of different strategies in different areas, working with different populations (older people, younger people, routine and manual workers, BME groups, men and women) and so map activity and service delivery to actual behaviour change, and disseminate good practice.

A further aim would be to better understand how to model the social and economic impact of any such changes in smoking behaviour to the wider determinants of health, i.e. better understand how reducing smoking prevalence improves the health and wealth of communities. A further goal would be to demonstrate the economic impact on the NHS, and enable smoking cessation work to be prioritised. All participants were aware of the importance of demonstrating the effectiveness of their work generally, and specifically around health inequalities, to wider audiences:

'Well the one thing we increasingly get... is for information about the cost of, the health care cost of you know anything we do particularly in regard to you know the impact on heart disease or stroke, or lung cancer. I mean, that is what is making the arguments for funders, is when we ask for additional funding around tobacco, is what is the impact on the regional economy as well as on the NHS? So you know, more information at the local level, around the cost, you know the savings, the short term savings around... anything we do to reduce smoking prevalence.' RL

Participants were aware that there were major issues to be faced in coming years around the future funding of tobacco control and services that would only be exacerbated if they could not provide accurate and credible data to their partners, whether in health or local government, to convince them to commission services, particularly in secondary care. This need clearly links to the lack of local prevalence data. This was reported as causing participants major problems when trying to convince agencies to support initiatives in their local area, as they were increasingly likely to need to state the prevalence of smoking in a particular area, set a target and then demonstrate that they are meeting the target.

The other 'wish' was for the data to be available in a form that would be easy to interrogate and be up to date:

'I think our problem is that there is not enough up to date information, you know? There is the household survey isn't very regular and accurate GP records would be great.' LL

4.4 Key points and conclusions

4.4.1 Key points

4.4.1.1 Addressing smoking and health inequalities

Regional and local leads were committed to addressing inequalities and smoking. However, there was considerable variation in both the scope of tobacco control activities, ranging from providing only smoking cessation services to co-ordinated, comprehensive tobacco control programmes, and the extent to which they targeted disadvantaged groups, ranging from little targeting to these groups being the major focus for interventions. These differences impacted on how evidence was interpreted and used, and how guidance was implemented.

4.4.1.2 Research evidence

Research evidence in the form of peer-review journal articles was rarely accessed and read in order to develop regional and local tobacco control policies designed to reduce health inequalities. When research articles were accessed participants tended to use them to inform a particular strategy, campaign or model of service delivery rather than to appraise the research evidence in key areas as a precursor to the development of strategies etc.

Summaries of research evidence were read (Cochrane, ONS and GHS reports, ASH bulletins, RCP reports) and the evidence used in these reports, and sometimes cited, was seen as a validated source of information and does inform the development of strategies and services. However, often the evidence was often 'lifted' from such reports by people working at a local and regional level and the source cited as the report or bulletin, rather than the original data source. The reported 'evidence' was accepted uncritically, without further reappraisal and without reading the original research article, thus distancing service delivery from research evidence.

NICE and Department of Health guidance were regarded as particularly valued as they were endorsed by key agencies, provided an accessible summary of the evidence and offered advice on how to translate this evidence into practice.

While summaries of statistical evidence and clinical evidence were widely available in the bulletins and reports, additional evidence (often qualitative) around the culture and context of smoking and health inequalities that participants needed to translate the guidance into service delivery were not cited in such reports/ bulletins. This was interpreted as an absence any such research by participants, and so they commissioned work on their local area, usually focus groups or interviews. Sometimes this work was conducted by universities, so the results might feed into the evidence base through publication as journal articles. However, more often participants used local insight work with market research companies who provided reports and presentations that were less likely to inform wider thinking or contribute to the evidence base.

There was confusion over research evidence and guidance, as NICE guidance was often cited as if it were original research, rather than guidance based on a review of the research evidence, and again NICE was cited, rather than the research evidence.

There was some recognition that more evidence was needed to inform the development of more effective initiatives addressing inequalities and smoking. Specifically more information was needed about how to target cessation services, address smoking in the home, and the nature and scale of the illicit and smuggled tobacco at the local level.

4.4.1.3 Other sources of data and information

Overwhelmingly, participants stated that there was a need for up-to-date evidence relating to health inequalities and smoking prevalence that could be broken down to local areas, particularly ward level. Previously available data, with the exception of SSS statistics, were criticised for being out of date and not having large enough sample sizes to provide meaningful local statistics. Participants were aware that such data would be critical to them for them to work effectively with local authorities. They were also essential for the planning and evaluation of policy and initiatives. It was hoped that the IHS would provide this evidence although there were concerns about the delay in reporting on the IHS and whether the data would meet all of their needs for robust local data.

Some participants relied on synthetic estimates from Public Health Observatories, or evidence from GP practices for smoking prevalence, but others had concerns about the reliability and quality of such data, and identified the lack of good regional and local prevalence data as significantly reducing their ability to identify and work with the disadvantaged groups.

Participants also wanted more information that they could use to predict or assess not only the health but also the economic impact of particular smoking initiatives on wider society and the NHS. This information was vital to convince partners to continue to support particular services, as competing priorities in health were already providing sophisticated economic cases to support their cases, and some participants were concerned that this was one area in which they were falling behind other services.

Some participants has already accessed data held by partner organisations (Fire Service, Police, Trading Standards, HM Customs, schools) and this was cited as a very positive move to future working and determining local and regional priorities and pooling intelligence and resources. However, other participants had been denied access to data from other organisations and believed more work would need to be done to enable information to cross organisational boundaries, although the move to local authorities might make this easier.

4.4.1.4 Reduced budgets for tobacco control

There was a concern that the resources and freedom given to regions and some localities to develop wider tobacco control initiatives would no longer be available, and that future efforts would be directed to smoking cessation services. Some participants believed that the drive for smoking cessation services to target a certain percentage of people from disadvantaged groups where smoking is high would

address the inequalities agenda. Others were less reassured, and felt that more could and should be done to promote and develop services and campaigns to direct people towards the services and to sustain their quit attempt.

Participants really valued the networking opportunities that they had through alliances, local strategic partnerships, training and conferences, and were concerned that many of these activities would not be sustained in the longer term. These formal and informal networks had provided a vital conduit for knowledge and information to flow between regions and localities and informed the development of thinking and services in many areas.

4.4.1.5 Working with local government

Concerns were expressed about the willingness of some local governments to engage with tobacco as a priority, as prevalence could be low in their areas, masking inequalities, and perhaps not a ‘vote winner’ in some areas.

Other concerns included whether new partners in local government would understand tobacco control as being more than smoking cessation services, particularly as a long term public health strategy would be unlikely to deliver quick results which could be more appealing for local government.

While many areas were already working closely and successfully with local government through alliances and partnerships, some local areas did not have developed or sustained relationships and there was a concern that this would lead to an inequitable provision of wider tobacco control services between localities, and so undermining the health inequalities agenda.

4.4.2 Concluding remarks

Overall, participants in this study have engaged in a range of work specifically motivated by the desire to reduce health and social inequalities by improving tobacco control initiatives and developing wider initiatives to reduce smoking prevalence and the harms caused by smoking. Their work has been supported in a number of key ways: firstly by the use of some primary research evidence, summary reports and reviews of research and the provision of guidance at national level; secondly by regional and local resourcing of tobacco control work to a level where sustained programmes and campaigns could be put in place; and thirdly by the motivation and energy of people working in tobacco control and the associated widespread collaborative and inter-agency working. However, the lack of recurrent, robust and timely local smoking prevalence data that can be linked to the social and economic disadvantage experienced by people in the regions/ localities has made it harder for participants to demonstrate that their work has stabilised or reduced inequalities in their areas. Their efforts have also been hampered by the lack of evidence for the effectiveness of particular strategies designed to reduce inequalities by reducing levels of smoking and smoking activities, meaning that many participants have had to improvise and put in place initiatives unsupported by the current evidence base.

While it is possible that the Integrated Household Survey (IHS) may serve many of these functions, a number of issues need to be considered. Firstly the IHS was developed to provide “high level estimates to a higher precision” than previous surveys and with the ability to drill down to a lower geographical level through an

increased sample size (450,000) which should be an improvement on previous surveys and estimates. However, there is still the problem with delays in data collection and publication which won't be resolved with this survey. The Office of National Statistics is responsible for the IHS, however it is unclear how much scope there is for input into the methods/outputs of the survey, although there is a statement on the ONS website that Government departments can "sponsor" specific questions.

Secondly, even if the IHS becomes established and publishes high quality data, there is still a limit to the degree of local level data. Presently the guidance states that in addition to regions there will be adequate data to look at unitary areas within the regions (such as Greater Manchester for example). Although useful this does not tie in with the Governmental strategies, including the new English Tobacco Action Plan, which have a strong focus on identifying local needs and providing local services. This is likely to be at local authority level, which the IHS will not be able to provide for. It is likely that data at the local level will be an even greater priority in the new structures, especially given the increased competition for funds.

In conclusion, future tobacco control policies, services and initiatives require sustained funding and support and access to good and reliable sources of data and research evidence. Furthermore people working in tobacco need clear indications drawn from wider research evidence as to 'what works' to reduce inequalities, and how to interpret and translate any resulting guidance into practice in their local area. Guidance as to how to evaluate and demonstrate the effectiveness of any services/ initiatives/ campaigns is also needed to build up the evidence base, as well as appropriate support to produce economic argument as to how these actions can save money for other services. Only when these measures are in place will people working in tobacco control be able to use their resources effectively to reduce smoking prevalence and health and social inequalities.

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Appendix A – search strategy

The following search terms, with adjustments to the wildcards and operators where appropriate, were used on Biosis, Cinahl Plus, Cochrane Library, DARE Database, Embase, EconLit, ISI, Medline, PsycInfo, Science Citation Index and the Social Science Citation Index for articles published from 2006 onwards.

1. smoking
2. smoking cessation
3. tobacco
4. “tobacco use disorder”
5. nicotine
6. smokers or smoker
7. cigar*
8. OR/1-7
9. ((smok* or anti NEXT smok* or tobacco or cigarette*) NEAR/3 (ban or bans or prohibit* or restrict* or discourage*))
10. ((smok* or anti NEXT smok* or tobacco or cigarette*) NEAR/3 (workplace or work NEXT place or work NEXT site or worksite))
11. TI ((smok* or anti-smok* or tobacco or cigarette*) N3 (public place* or public space* or public area* or office* or school* or institution*)) OR AB ((smok* or anti NEXT smok* or tobacco or cigarette*) NEAR/3 (public place* or public space* or public area* or office* or school* or institution*))
12. ((smok* or anti NEXT smok* or tobacco or cigarette*) NEAR/3 (legislat* or government* or authorit* or law or laws or bylaw* or byelaw* or bye NEXT law* or regulation*))
13. ((tobacco NEXT free or smoke NEXT free) NEAR/3 (hospital or inpatient or outpatient or institution*))
14. ((tobacco NEXT free or smoke NEXT free) NEAR/3 (facilit* or zone* or area* or site* or place* or environment* or air))
15. ((tobacco or smok* or cigarette*) NEAR/3 (campaign* or advertis* or advertiz*))
16. ((billboard* or advertis* or advertiz* or sale or sales or sponsor*) NEAR/3 (restrict* or limit* or ban or bans or prohibit*))
17. (tobacco NEXT control NEAR/3 (program* or initiative* or policy or policies or intervention* or activity or activities or framework))
18. ((smok* or tobacco) adj (policy or policies or program*))
19. ((retailer* or vendor*) NEAR/3 (educat* or surveillance* or prosecut* or legislat*))
20. test purchas*
21. voluntary agreement*
22. health warning*
23. ((tobacco or cigarette*) NEAR/3 (tax or taxes or taxation or excise or duty NEXT free or duty NEXT paid or customs))
24. ((cigarette* or tobacco) NEAR/3 (packaging or packet*))
25. ((cigarette* or tobacco) NEAR/3 (marketing or marketed))
26. ((cigarette* or tobacco) NEAR/3 (price* or pricing))
27. point of sale
28. vending machine*
30. (trade NEXT (restrict* or agreement*))
32. (contraband* or smuggl* or bootleg* or cross NEXT border shopping)

- 33. (tobacco control act or clean air or clean indoor air)
- 34. ((reduce* or prevent*) NEAR/3 (environmental tobacco smoke or passive smok* or secondhand smok* or second hand smok* or SHS))
- 35. ((population level or population based or population orientated or population oriented) NEAR/3 (intervention* or prevention or policy or policies or program* or project*))
- 36. (community) NEAR/3 (intervention* or prevention or policy or policies or program* or project*))
- 37. “smoking cessation” or “cessation support”
- 38. smokefree or smoke-free or “smoke free”
- 39. 8 AND OR/9-38

Appendix D – Interview schedule Regional Tobacco Control Leads



Tobacco control, inequalities in health and action at the local level in England:

Interview Schedule Regional Leads

Researcher: Dr Jude Robinson

- Can you tell me something about the region you work in and the role you have as regional tobacco manager?
- What are the particular issues in your area generally, and in relation to inequalities and smoking? How do you think your region compares to other regions in England?
- Can you tell me about the current regional tobacco control strategy/plan and the main priorities and elements of the strategy? How they were identified?
- What do you think are the key issues around inequalities?
- What action have you developed in the region aimed at reducing inequalities and why?
- Have there been any particular issues for you (nationally/ regionally/ locally)?
- Was there anything you would have liked to have been able to do?
- Was there anything that didn't turn out the way you expected and how did you learn from this?
- What data are you using/ have you used to inform policy/strategy development?
 - How did you access it and in what form?
 - How useful was it to you?
 - How did you evaluate the evidence?
 - Do you find Cochrane and NICE Guidance helpful?
 - Have you done any reviews around inequalities and who did them and what did you find?

- What data do you use to evaluate your strategy, particularly in relation to inequalities in smoking? How useful have you found it?
- What types of data would be helpful in developing and evaluating your work on inequalities and smoking?
- If not already mentioned – would you like to comment on any work you have done in the following areas:
 1. Cessation services
 2. Compliance with smokefree legislation
 3. Compliance with tobacco sales legislation
 4. Smuggling
 5. Social marketing
 6. Local media campaigns/ community awareness / engagement
 7. Work on smokefree homes
- What do you believe are the next steps for smoking cessation and inequalities, both in your region and for England? What would be the ideal and what do you think is the reality? How will this impact on health and smoking inequalities?

Thanks and move on to discuss recruitment of local contacts (in PCTs) who have been working on inequalities and smoking, most deprived PCT.



Appendix E – Interview schedule Local Tobacco Control Leads



Tobacco control, inequalities in health and action at the local level in England:

Interview Schedule Local Leads

Researcher: Dr Jude Robinson

- Can you tell me something about the area you work in and the role you have?
- What are the particular issues in your area generally, and in relation to inequalities and smoking? How do you think your area compares to other areas within the wider region/ England?
- Can you tell me about the current tobacco control strategy/plan and comment on the priorities of the strategy?
- What do you think are the key issues around inequalities?
- What action have you developed in your local area aimed at reducing inequalities and why?
- Have there been any particular issues for you (locally/ regionally)?
- Was there anything you would have liked to have been able to do?
- Was there anything that didn't turn out the way you expected and how did you learn from this?
- Have you used any additional sources of data to help you implement the regional tobacco strategy/ address inequalities?
 - How did you access it and in what form?
 - How useful was it to you?
 - How did you evaluate the evidence?
 - Do you find Cochrane and NICE Guidance helpful?
 - Have you done any reviews around inequalities and who did them and what did you find?

- Have you used any additional data to evaluate your strategy, particularly in relation to inequalities in smoking? How useful have you found it?
- What types of data would be helpful to aid your work on inequalities and smoking?
- If not already mentioned – would you like to comment on any work you have done in the following areas:
 8. Cessation services
 9. Compliance with smokefree legislation
 10. Compliance with tobacco sales legislation
 11. Smuggling
 12. Social marketing
 13. Local media campaigns/ community awareness / engagement
 14. Work on smokefree homes
- What do you believe are the next steps for smoking cessation and inequalities, both in your local area and for the region/ England? What would be the ideal and what do you think is the reality? How will this impact on health and smoking inequalities?
- Are there any issues that you would like to raise?

Thank you

