THE IMPACT OF SMOKEFREE LEGISLATION IN ENGLAND: EVIDENCE REVIEW

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EXECUTIVE SUMMARY

Legislation prohibiting smoking in workplaces and enclosed public places was introduced in England in July 2007. This report outlines existing evidence of the impact of this legislation and places this research in an international context.

Evidence now exists of the impact of smokefree legislation on:

- exposure to the harmful effects of secondhand smoke (SHS);
- changes in health and behaviour following smokefree legislation; and
- the impact of smokefree legislation on the hospitality industry.

A significant body of UK and international evidence now exists which demonstrates that smokefree laws are effective in reducing exposure to SHS. In adults, previous studies have shown that barworkers have among the highest occupational exposure to SHS of any group of employees. A study of barworkers in England showed that their exposure reduced on average between 73% and 91% and measures of their respiratory health significantly improved after the introduction of the legislation. Children are particularly vulnerable to the effects of SHS and research in England has explored changes in exposure over time. A study found that between 1996 and 2007, SHS exposure among children declined by nearly 70%. The reductions were greatest in the period immediately before the introduction of smokefree legislation, coinciding with national mass media campaigns around the dangers of SHS.

The health impacts of SHS exposure are well documented and international evidence has shown that smokefree laws can have a positive impact on health. SHS can have a particularly damaging effect on cardiovascular health and studies in the USA, Scotland and elsewhere have shown that smokefree laws can reduce hospital admissions for heart attacks. In England, the legislation resulted in a statistically significant reduction (–2.4%) in the number of hospital admissions for myocardial infarction (MI). This amounted to 1,200 emergency admissions for MI in the year following the introduction of smokefree legislation. Research in England also identified changes in smoking behaviour after the legislation. A study looking at the impact of the law in particular communities found a general pattern of smokers cutting down their tobacco consumption in all locations where the study took place. Another study found a statistically significant increase in the number of people making a quit attempt at the time of the legislation (July and August 2007), equivalent to 300,000 smokers in England trying to quit.

The introduction of smokefree legislation can involve significant changes for some employers, in particular those in the hospitality industry. International evidence suggests that, after allowing for short-term costs associated with the legislation (e.g. new signage, employee training), the introduction of smokefree legislation has a net positive effect on businesses. A feasibility study was conducted in England to explore ways of examining the impact of the law on restaurants, bars, hotels and other hospitality venues. This found no evidence of any obvious effect of smokefree legislation on the hospitality industry in England. However, the authors emphasised that a longer-term analysis of impact is needed, ideally when five years' data are available post-legislation.

INTRODUCTION

This report summarises research evidence on the impact of smokefree legislation. It outlines the results of peer-reviewed research on the impact of England's smokefree law which was introduced on 1 July 2007. It also describes key findings from the international literature, drawing primarily on systematic reviews. The report begins with a background section setting out the rationale for smokefree laws and their international context. It then reviews evidence relating to impact in three key areas:

- exposure to secondhand smoke (SHS);
- changes in health and behaviour; and
- impact on the hospitality industry.

BACKGROUND

A number of countries and states have now implemented policies to make public places and workplaces smokefree. These policies aim to protect workers and the general public from the harmful effects of SHS and also offer the potential to influence smoking behaviour and smoking norms. SHS is made up of the smoke emitted from the burning end of a cigarette or from other tobacco products in combination with the smoke exhaled by the smoker (WHO, 2007). It contains a number of toxins and is carcinogenic to humans (IARC, 2004). Scientific evidence accumulated over a number of years has shown that exposure to SHS causes death, disease and disability (WHO, 2005).

The development and implementation of smokefree legislation forms a key part of international efforts to reduce the burden of disease attributable to tobacco use. An international strategy for tobacco control is set out in the World Health Organization (WHO) *Framework Convention on Tobacco Control* (FCTC), the world's first global public health treaty. The FCTC was adopted by the World Health Assembly on 21 May 2003 and entered into force on 27 February 2005. It sets out demand reduction strategies as well as policies to reduce supply. To date, the Convention has been signed by 172 member states. Countries and jurisdictions that have signed the FCTC commit to promoting its objectives and implementing the measures described within it. Some of these measures have been expanded into a series of guidelines that are intended to assist member states in meeting their obligations to the FCTC.

At its second session in July 2007, the Conference of the Parties for the FCTC adopted guidelines for the implementation of Article 8 on protection from exposure to tobacco smoke. Article 8 requires the adoption of effective measures to protect people from exposure to tobacco smoke in indoor workplaces, indoor public places, public transport and, as appropriate, in other public places (WHO, 2007).

At the European level, the Health and Consumer Protection Directorate General of the European Union published a green paper in January 2007 entitled *Towards a Europe free from tobacco smoke: policy options at the EU level* (EU, 2007). The green paper outlined a number of potential approaches to promote the

development of smokefree public places across Europe and invited member states and others to respond to these suggestions. Following the consultation, the EU Council adopted a recommendation on smokefree environments on 30 November 2009. This recommendation urged all member states to introduce measures to protect the public from exposure to tobacco smoke in indoor workplaces, public places and public transport. The measures were intended to be in force within three years of adoption of the recommendation.

All parts of the UK now have smokefree legislation in place which complies with Article 8 of the FCTC and the EU council recommendation. Scotland was the first country in the UK to introduce a smokefree law, from March 2006. A comprehensive evaluation of the impact of the legislation in Scotland was conducted (Haw et al, 2006). Smokefree legislation in the remainder of the UK was set out in the Health Act which received Royal Assent in July 2006 and entered into force in April 2007 in Wales and Northern Ireland, and in July 2007 in England.

In advance of the introduction of the legislation in England, the Department of Health's Policy Research Programme commissioned a series of studies to evaluate the impact of the new law. Five studies were commissioned:

- a study examining barworkers' health and air quality (Semple et al, 2009);
- an assessment of trends in key health outcomes and smoking prevalence through secondary analysis (Sims et al 2010a, Sims et al 2010b);
- a qualitative study exploring the impact of the legislation on attitudes, prevalence, quitting and health (Hargreaves et al, 2010, Platt et al, 2009);
- secondary analysis of data to explore the impact on the hospitality sector (Ludbrook et al, 2009); and
- a mapping exercise that collected and reviewed other international and UK research on the impact of smokefree legislation.

To date a number of peer-reviewed reports and papers have been produced from the first four studies and key findings are included in this report, placed in the context of wider evidence identified by the mapping study.

EXPOSURE TO SECONDHAND SMOKE

A significant body of evidence now exists which demonstrates that smokefree laws are effective in reducing SHS exposure (IARC, 2009, Callinan, 2010). Studies have examined exposure levels pre and post-legislation in a range of settings including workplaces, restaurants, pubs, other public places and the home. In England, the research commissioned by the Department of Health focused on examining the impact of the legislation on reducing SHS exposure in two groups. First, a study was commissioned which focused on barworkers, as previous studies have found that barworkers have among the highest occupational exposures to SHS of any occupational group (Howard, 2004). In addition, as part of the secondary analysis study listed above, an analysis of trends in exposure in children was conducted.

Exposure in barworkers

The barworkers study was longitudinal and examined SHS exposure pre and post-legislation (Semple et al, 2009). At phase 1 of the study, during May and June 2007, 178 barworkers were recruited from a total of 46 separate bars across three urban and two rural geographic areas in England. Barworkers were followed up two months after the introduction of smokefree legislation (phase 2) and again one year after phase 1 (at phase 3). The workers completed a questionnaire about their exposure to SHS, health and attitudes to the legislation and had their lung function measured. SHS exposure was assessed by collecting a sample of their saliva to measure cotinine, a breakdown product of nicotine, and by directly measuring air quality in the bar as $PM_{2.5}$ (particulate matter less than 2.5 micrometres in diameter). $PM_{2.5}$ is a robust measure of SHS concentrations in environments where there are no other sources of combustion and has been widely used in studies that examine air quality pre and post-smoking restrictions.

The study examined:

- how air quality and barworkers' SHS exposure changed over time;
- whether barworkers experienced any improvements in their respiratory health following introduction of the restrictions; and
- how barworkers' attitudes to smokefree legislation and perceptions about the hazard posed by exposure to SHS changed.

SHS exposure

Measures of barworkers' exposure to SHS showed large reductions post-legislation. These were consistent across different assessment methods with salivary cotinine levels; air concentrations of fine particulate matter ($PM_{2.5}$); and self-reported duration of exposure to SHS at work. All reduced on average by between 73% and 91%. $PM_{2.5}$ air quality, discreetly measured in over 50 bars, demonstrated an 81% improvement from phase 1 to phase 2. There was some indication that exposure to SHS increased between phase 2 and phase 3 with non-smoking barworkers' salivary cotinine levels and reported occupational exposure to SHS increasing but discreetly measured $PM_{2.5}$ concentrations suggest that this effect was likely to be isolated to a small number of pubs.

The research team who conducted the barworkers study in England carried out similar research in Scotland and Wales pre and post-smokefree legislation (Semple et al, 2010). They found when comparing Scotland and England in particular that concentrations of $PM_{2.5}$ were about 50% lower in English bars compared with Scottish bars when measured at phase 1. A proportion of this difference is likely to be due to the timing of the phase 1 baseline surveys. Phase 1 was carried out in cold winter months (January and February) in Scotland when people would have been smoking inside the bars. Phase 1 in England was carried out in May and June when the weather was more pleasant and bar customers may have been sitting in open-air areas where available. Other reasons for the difference may include the lower population smoking prevalence in England compared with Scotland, differing cultural attitudes to smoking, better ventilation in English pubs and/or a shift in the 'acceptability' of smoking in the presence of non-smokers between 2006 and 2007.

Respiratory health

Barworkers' health showed significant improvements following the introduction of smokefree legislation in England. Self-reported respiratory symptoms decreased from phase 1 to phase 3: 40% of bar workers reported one or more respiratory symptoms at phase 3 compared with 67% of workers at phase 1. A similar decrease was observed in sensory symptoms (e.g. sore/red eyes or throat). These health improvements were maintained even after excluding workers who reported having a cold at either phase 1 or phase 3 of the study.

Attitudes

The analysis of barworkers' attitudes to SHS and smokefree restrictions demonstrated that they were broadly in favour of the legislation prior to introduction, with 63% agreeing or strongly agreeing with the proposed ban on smoking in public bars. The numbers expressing agreement increased to 74% after the restrictions came into force. There was a high level of concern about the potential economic effects on the bar trade of the legislation at baseline but this reduced markedly in the period immediately following the introduction of the legislation (at phase 2).

Limitations

The study involved two follow-up points with 118 of the original 178 (66%) of workers being seen at phase 2 and 63 (35%) at phase 3. These follow-up rates illustrate how difficult it is to keep a generally young and mobile working population such as barworkers involved in a longitudinal study. This places some limitations on the representativeness of the longer-term follow-up data outlining changes in barworkers' health although, importantly, not the air quality data. In addition, although the research team originally intended to measure changes in lung function in barworkers pre and post-legislation, this proved to be challenging to do in bar settings and the limited data provided were difficult to interpret.

Exposure in children

As part of the study assessing trends in key health outcomes and smoking prevalence, an analysis of trends in children's exposure to secondhand smoking in England was conducted. The analysis initially examined the period from 1996 to 2006 (Sims et al, 2010a). The analysis was recently updated to include 2007,

so encompassing the few months immediately following the introduction of smokefree legislation in England (RCP, 2010). It used Health Survey for England data which include validated (cotinine) data of SHS exposure. The analysis focused on non-smoking children aged 4 to 15 and explored three issues:

- whether exposure had changed over time;
- the factors influencing SHS exposure in children; and
- whether there were any differences between households that do or do not allow smoking.

The analysis found that SHS exposure in children had reduced over time. Between 1996 and 2007 SHS exposure in children in England declined by nearly 70%. Declines were greatest in the two years immediately preceding smokefree legislation (2005 and 2006). This may reflect the media campaigns and greater publicity on the impacts of SHS during this period. Absolute declines in exposure were greater in those most exposed at the outset (including those living in households allowing smoking, with parents who smoke and in lower socio-demographic status households), indicating that absolute inequalities have been declining but inequalities still exist.

The factors that most heavily influenced children's exposure were whether smoking is allowed in the home and whether the child's parents and carers smoke. In other words, the main factors influencing SHS exposure in children in England are modifiable. Independent of these factors, children from more deprived backgrounds had higher levels of exposure, suggesting that community exposure may also be greater in these children. White children had significantly higher exposures than black or Asian children.

Finally, the analysis found that there were differences between households that do and do not allow smoking. Households that allow smoking inside are more likely to have a head of household who is not currently employed or of lower social class, and to contain parents with a lower level of education, at least one parent who smokes and children of white ethnicity.

An important limitation of this work was that it could not include a longer follow-up period after the introduction of the legislation. This arose because Health Survey for England data were not available beyond the end of 2007 at the time the study was conducted.

Another related study using the same dataset found that the proportion of children living with two parents who smoke had declined from 11% to 5% between 1996 and 2007 (Jarvis et al, 2009). Importantly, this study showed that there was no evidence of transfer of smoking to the home during this period.

International evidence on secondhand smoke exposure

The wider literature on SHS exposure and smokefree legislation supports the findings of the English studies and also provides evidence about changes in

exposure in other groups and settings. A recent systematic (Cochrane) review identified 31 studies that met the review's quality threshold and examined changes in exposure to SHS as a result of smokefree legislation. Most of these studies explored workplace exposure (Callinan et al, 2010). All of the studies showed clear results of reduced self-reported exposure to SHS. This was either in the length of time exposed, ranging from a 71% to a 100% reduction, or in the proportion of those exposed, ranging from 22% to 85% (Callinan et al, 2010). A number of studies included in the review did not just consider self-reported exposure but also validated these accounts using biomarkers such as salivary cotinine. Eighteen studies included validated exposure measures and also found significant reductions in exposure, ranging from 39% to 89%. There was a greater reduction in exposure to SHS in hospitality workers compared with the general population.

A range of studies have also examined the impact of smokefree legislation on SHS exposure in the home. This is an important area for research, as opponents of smokefree legislation have claimed that it could lead to a displacement of smoking into the home, putting children in particular at greater risk. The findings of the study described above show that, in the period leading up to and immediately following the introduction of smokefree legislation in England, children's exposure reduced rather than increased. Research in Scotland and in Wales following the introduction of smokefree legislation there identified similar findings (Akhtar et al, 2007, Holliday et al, 2009). International evidence also suggests that smokefree legislation does not increase smoking in the home. The recent Cochrane review identified 15 studies that measured SHS exposure in the home and found that overall these studies detected no change in exposure at home following the implementation of smokefree legislation, with three studies finding that exposure levels in the home reduced (Callinan et al, 2010).

Overall, therefore, research evidence from England and internationally demonstrates that smokefree legislation is effective in reducing exposure to SHS in adults and in children. In addition, there is no significant evidence that introducing smokefree laws in public places displaces smoking into the home.

CHANGES IN HEALTH AND BEHAVIOUR

The health impact of exposure to SHS is well documented and includes cancer, cardiovascular disease and respiratory disease (US Department of Health and Human Services, 1990). The introduction of smokefree legislation, by reducing exposure to SHS, has the potential to have a positive impact on health at the individual and population level. In addition, smokefree legislation can influence smoking behaviour and social norms around smoking, therefore helping to reduce tobacco consumption and promoting smoking cessation. Considerable research evidence on the health impact of smokefree legislation as well as the behavioural and social impact now exists. New studies on the impact of smokefree legislation in England add to this evidence-base. This report first examines the impact on one aspect of health – hospital admissions for heart attacks – followed by the impact on attitudes and behaviour, including tobacco consumption and smoking cessation.

Hospital admissions for heart attacks

Most studies examining the impact of smokefree legislation on health have focused on the impact on acute respiratory illness and on cardiovascular disease (IARC, 2009). Beneficial changes to the respiratory health of barworkers following the introduction of England's smokefree law have already been outlined above. In addition, new evidence has recently been published on the impact of smokefree legislation on reducing hospital admissions for myocardial infarction (MI) – heart attacks (Sims et al, 2010b). SHS exposure can increase the risk of a heart attack. This arises because exposure to SHS can very quickly cause blood platelets to become stickier, damage the lining of blood vessels, and impairing the ability of the coronary arteries to dilate (US Department of Health and Human Services, 1990). This means that exposure to SHS not only increases the long-term risk, but also the immediate risk of a heart attack. Despite the fact that the dose of smoke delivered to a passive smoker is substantially lower than that delivered to an active smoker, the risk of coronary heart disease in passive smokers is more than one third of the risk associated with actively smoking 20 cigarettes per day (Whincup et al, 2004).

As part of a Department of Health funded study assessing trends in key health outcomes, an analysis of Hospital Episode Statistics was conducted to explore the impact of smokefree legislation on admissions for MI. The study examined emergency admissions from July 2002 to September 2008 and so included 15 months of post-legislative data. The analysis adjusted for secular and seasonal trends and also variations in population size. It found a statistically significant reduction (–2.4%) in the number of admissions for MI following the implementation of smokefree legislation. This was equivalent to 1,200 fewer emergency admissions for heart attacks in the first year following the implementation of the legislation. The study also examined differences by age and gender and found a small but significant reduction in admissions in men (3.1%) and women (3.8%) aged 60 and over, and men (3.5%) but not women (2.5%) aged under 60. However, the results for women were less conclusive than those for men and should be treated with caution. Further details on potential explanations for sex differences in impact can be found in Sims et al, 2010b.

The study found smaller declines in admissions in England than an analysis of the health impact of smokefree legislation in Scotland (Pell et al, 2008). There are at

least two possible explanations for this. The first, as highlighted in the barworkers study above, was the fact that levels of exposure to SHS immediately before the introduction of smokefree legislation were lower in England than in Scotland. Second, the English study accounted for other factors that could lead to changes in admissions for heart attacks, most notably the fact that admissions for heart attacks were already declining, something that the Scottish study and some other similar studies did not account for (Sims et al, 2010b).

International evidence of impact on cardiovascular health

Recent systematic reviews of the international literature on smokefree legislation have also outlined its impact on cardiovascular health, primarily on hospital admissions for MI and other related cardiac conditions (IARC, 2009, Callinan et al, 2010). The recent Cochrane review included ten studies that reported hospital admission rates for MI or coronary heart disease following the introduction of smokefree legislation (Callinan et al, 2010). Five of these were in the USA, three in Italy, one in Canada and the final study in Scotland as cited above (Pell et al, 2008). Ten of these studies showed a significant drop in hospital admissions for MI following the legislation, with the remaining two showing a drop in deaths from coronary heart disease and the Scottish study showing better prognosis following acute coronary syndrome among non-smokers. An additional study described elsewhere in the review outlined the cost savings to the health service (in a study conducted in New York) as a result of reduced hospital admissions for heart attacks (Juster et al, 2007). Thus there is now considerable and consistent evidence from a number of countries that the impact of smokefree legislation on cardiovascular health, in particular admissions for heart attacks, is positive.

Changes in behaviour

Although the main aim of smokefree legislation is to protect the public from SHS and through that protection improve health, it is also now apparent that this type of legislation has the potential to change social norms around smoking and result in changes in smoking behaviour. Evidence from England highlights the extent of these changes, most notably in the results of a detailed qualitative study that aimed to explore the behavioural, social and cultural impact of the legislation. It was a longitudinal study conducted in six contrasting areas located in and around two major cities, one in the north and one in the south of England. The study involved in-depth, repeated interviews pre and post-legislation with a panel of adults in each community, pre and post-legislation interviews with professionals, group discussion post-legislation and repeat observations in a range of public places in each community pre and post-legislation.

The study explored how smokers, non-smokers and key professionals perceived the legislation prior to its introduction and details on this aspect of the study can be found in the full report (Platt et al, 2009). The study also:

- compared changes over time in perceptions, attitudes and behaviour pre and post-legislation; and
- examined whether the smokefree law impacted on population groups and communities in different ways.

Changes over time in perceptions, attitudes and behaviour

The study looked at people's views of the legislation and found that there were shifts in attitudes from initial resentment to acceptance of the changes, and a growing perception of the personal, health and environmental benefits of smokefree. The research also found that in all study areas there was a high degree of compliance with the legislation, with only a few minor infringements observed or reported, usually at the boundaries between public and outdoor spaces. This finding supports the compliance data submitted by local authorities which are outlined elsewhere (DH, 2008).

The study found no significant evidence of increased smoking in the home among study participants after the law was in place. In contrast, some participants increased restrictions on smoking at home.

For the most part, people continued to socialise in public settings to the same degree as before the legislation. However, particularly among those living in the less advantaged localities, some had curtailed social outings and were now either socialising (and smoking) more at home or socialising less than before.

In relation to smoking behaviour, there was a general pattern of reduced tobacco consumption among participants in all locations, including cutting down and, to a lesser extent, quitting (Hargreaves et al, 2010). Many respondents in all localities described decreased tobacco consumption while out socialising in public social settings. Smokers reduced consumption largely because of the inconvenience of going outdoors to smoke, but also because of a perception that their greater visibility as a smoker attracted public disapproval. The study found that couples or friendship groups tended to change behaviour together (e.g. cutting down or quitting) or continued to smoke together. There was little reported change in smoking at work, but that was primarily because most workplaces were already subject to smokefree restrictions prior to implementation of the legislation (Hargreaves et al, 2010, Platt et al, 2009).

Impact on different groups and communities

The study also aimed to identify the differential impact of the legislation on the study groups. Overall, there was relatively little evidence of differences by locality or by the individual characteristics of study participants.

However, those living in the more disadvantaged localities were less likely than smokers in the more affluent areas to have access to more comfortable outdoor spaces where they could smoke. In addition, in areas of disadvantage, some older men and women with children reported that they had curtailed social activities and experienced a sense of loss of the pleasures of socialising in bars and cafés where they could smoke with friends. Finally, some South Asian men reported that it could be difficult to maintain their quit attempts in the face of the continued cultural pressures to smoke within their peer groups. Other research in England has also highlighted differences between some ethnic groups in their experience of the legislation and curtailment of social activities in older people (Lock et al, 2010).

The research team had previously conducted a similar study examining the impact of smokefree legislation on perceptions, behaviour and attitudes in Scotland

following the introduction of legislation there in 2006 (Martin et al, 2008). With relatively few exceptions, findings in the English study were very similar to those in Scotland.

Limitations

The study employed qualitative methods which have the benefit of yielding rich and detailed insight into people's views and circumstances. However, this means that the research was not and did not aim to be representative of the English population as a whole. The views expressed were by their nature specific to the individuals and communities included. The study was limited to six areas in two parts of the country and therefore was not able to explore the views and behaviours of people living in other parts of the country. It is also worth highlighting that, although the study explored smoking behaviour including cutting down and quitting pre and post-legislation, this was based on interviewees' accounts of their behaviour; no attempts were made to validate these accounts. Finally, pre-legislation data were collected in the three months leading up to the legislation, when publicity about the law was already in place. As a result, differences in attitudes and behaviour may have been less marked than they would have been if baseline data collection had started earlier.

Smoking behaviour

In addition to the Department of Health funded study examining the social and cultural changes that occurred as a result of smokefree legislation, other research in England provides further evidence of how the new law changed smoking behaviour.

An analysis of data from the smoking toolkit study suggests that the legislation did influence intentions and attempts to stop smoking (Hackshaw et al, 2010). The toolkit study is a monthly series of national household surveys with smokers and recent ex-smokers who are followed up for six months with the sample weighted to match census demographics (West, 2006). Between February and June 2007 (pre-legislation) smokers in the study were asked about their intention to quit leading up to the introduction of the smokefree law. Between July and November 2007 (post-legislation) participants were asked if they had made a quit attempt as a result of the legislation. In addition, the number of quit attempts made by smokers in the study was compared between 2007 (the year the law was introduced) and 2008 (one year later) to ascertain any differences in cessation attempts that may have been due to the smokefree legislation.

The analysis found that a higher proportion of smokers reported making a quit attempt during July and August 2007 (8.6%) compared with one year later (5.7%). This difference was statistically significant, while there were no other significant differences in the number of quit attempts made at other times in 2007 when compared with 2008. The proportion of smokers who stated that they planned to quit before the smokefree legislation came into force decreased through time, while the proportion of smokers who planned to quit when the law came into force increased as its implementation drew closer. In the five months following the legislation 19% of smokers who made a quit attempt reported that they had done so in response to the smokefree law. The authors concluded that the observed increase in quitting behaviour at the time of the new law was equivalent to over 300,000 additional smokers in England trying to quit (Hackshaw et al, 2010).

This increase in quitting behaviour is supported by routine data from NHS Stop Smoking Services (Information Centre, 2008). In the period between April and December 2007, so immediately preceding and in the months following the introduction of the new law, the Stop Smoking Services reported a 23% increase in the number of people setting a quit date, when compared with the same period the year before. This translated into a 22% increase in the number of successful quitters at four weeks (Information Centre, 2008). However, it is important to note that the results of the toolkit study and evidence of increased client numbers attending Stop Smoking Services only provide evidence of short-term behaviour change and are not necessarily indicative of longer-term shifts in smoking prevalence that can be directly attributed to smokefree legislation. With relatively few data points utilised from the pre-legislative period, it was also not possible to examine the effects over and above longer-term trends using more sophisticated time series analyses.

International evidence on smoking behaviour change

Studies in other countries have also explored the extent to which smokefree legislation leads to smokers changing how much they smoke or quitting. These studies are, however, diverse in their methods and it is often difficult to disentangle the effect of other factors (including, importantly, other tobacco control measures in place at the same time) on changes in behaviour. A number of studies have examined tobacco consumption before and after the introduction of smokefree laws, using measures such as number of cigarettes smoked per day and/or pack sales. The recent Cochrane review identified 13 studies that included tobacco consumption as an outcome and all but one of these identified a reduction following the introduction of smokefree legislation (Callinan et al, 2010). The impact of smokefree legislation on smoking cessation is less conclusive. One study compared quit rates in Scotland with the rest of the UK after the Scottish smokefree law was in place but legislation had yet to be introduced in other parts of the UK. This comparison showed no change in cessation rates in Scotland compared with the rest of the UK (Hyland et al, 2009). However, other studies using different methods did find that smokers in Scotland quit following the introduction of the new law (Semple et al, 2007, Fowkes et al, 2008), and an additional study in Scotland found that sales of nicotine replacement therapy increased significantly, suggesting that more smokers were trying to quit (Lewis et al, 2008). Another recent review of 19 studies found a link between the strength of smokefree laws and changes in smoking behaviour, with more comprehensive laws (of the type in place in England) leading to positive reductions in the populations covered (IARC, 2009). What is clear from UK and international evidence is that legislation to ban smoking in workplaces and public places does change smoking behaviour and can encourage some smokers to quit. A longer period of follow-up is needed to draw firmer conclusions about whether changes in behaviour prompted by smokefree legislation are sustained in the longer term.

IMPACT ON THE HOSPITALITY INDUSTRY

The introduction of smokefree legislation involved significant changes for many employers and businesses in England, in particular those in the hospitality industry. Although many workplaces were already smokefree before July 2007, others were not, including most pubs and some hotels and restaurants. Some employers and organisations in this sector were concerned that smokefree laws would mean a loss of customers as smokers chose to stay away from venues where they could not smoke. These concerns were exacerbated by reports from the tobacco industry which, in England as elsewhere, stated that the introduction of smokefree legislation would lead to job losses and business closures (IARC, 2009).

The Department of Health commissioned a scoping study which examined the feasibility of using a number of different datasets to explore the impact of smokefree legislation on the hospitality industry in England, Scotland and Wales (Ludbrook et al, 2009). The results of this scoping study should be regarded as preliminary as a longer post-legislation follow-up period is required to more robustly assess whether smokefree legislation in the UK has had a significant impact on bars, restaurants and other hospitality industry venues. The study included information from three main sources:

- a review of relevant literature;
- the Labour Force Survey; and
- other official data sources.

Literature

A search was undertaken to update a previous review of the literature on the impact of smokefree legislation on the hospitality industry (Ludbrook et al, 2005). This identified a number of peer-reviewed papers and grey literature including three relevant literature reviews. The studies that have been conducted have estimated aggregate effects for specific geographic areas and specific sectors including restaurants, bars and hotels. The most recent studies in the USA, Canada, Australia, Argentina, South Africa and New Zealand mainly confirm earlier findings that any impact of smokefree legislation on the hospitality sector is minimal and does not reach statistical significance. One US study found a statistically significant effect on employment in bars.

Labour Force Survey

The Labour Force Survey is a population survey that collects labour market data. Preliminary analysis of this survey to examine the impact of smokefree legislation on employment in the hospitality industry was conducted. The employment categories examined were bar and restaurant workers. This analysis examined trends from 1994 to 2008 and hazard models for employment and unemployment. The time series data available showed considerable variation around the trend within which any impact of smokefree legislation was not apparent. The very small post-legislation sample was insufficient for conducting hazard model analyses.

Other official data sources

The study also examined a number of other potentially relevant sources of data including: the Annual Business Inquiry; tourism data; licensing data; data on consumer spending; and data on gambling.

Annual Business Inquiry data were only available to 2008 at the time the scoping study was conducted. These data showed that turnover fell in 2007 for bars but not for restaurants or hotels. Employment data did not show any consistent change. Comparisons of trends in England, Scotland and Wales up to 2007 did not show any obvious effect of smokefree legislation at the level of the hospitality industry.

Routinely available tourism data showed no evidence of an effect related to the introduction of smokefree legislation in England and Scotland. There was, however, a limited amount of data and the sector trends are affected by the state of both the UK and the global economy.

Licensing data for Scotland showed no evidence of an effect related to the introduction of smokefree legislation. Trend data for England and Wales were not available because of changes to licensing arrangements, although estimated data showed an increase in licences between March 2007 and March 2008.

Data on consumer spending showed some signs of a small decline in the third quarter of 2007 in the period following the introduction of smokefree legislation, but the size of this fall did not reach statistical significance.

Limited available data on gambling showed a decline in turnover for bingo halls against a reducing growth trend. The authors argued that it would be difficult to attribute this between the impact of smokefree legislation and a trend towards other forms of gambling.

Limitations and conclusions

In this scoping study it was only possible to look at data that included a short follow-up period post-smokefree legislation. More than two years' follow-up data and at least 12 data points post-intervention would seem to be minimum standards for a robust analysis. In addition, the study was limited to scoping publicly available datasets. Some commercial data sources were identified but analysis would require to be commissioned. There are relatively few sources of representative and objective primary data series available in the commercial sector.

Overall, the feasibility study concluded that there were insufficient data available in the Labour Force Survey to analyse employment effects and that further analysis should not be considered until at least five years' data were available post-implementation. Further research based on consumer spending patterns may be worth commissioning.

International evidence on the impact of smokefree legislation on the hospitality industry

The evidence review updated as part of the UK scoping study is complemented by two other recent systematic reviews (IARC, 2009, Callinan et al, 2010).

These reviews show that smokefree laws do impact businesses in the hospitality industry in a number of ways, many of them positive. The health of employees is improved, as the English barworkers study described above illustrates. Other studies have found that insurance, cleaning, maintenance and potential litigation costs can all be reduced when smokefree workplaces are introduced (IARC, 2009). Studies from other countries show that there are short-term costs associated with the legislation for all businesses (new signage and training for employees, for example). Overall, however, existing evidence from developed countries in particular suggests that smokefree laws have a net positive effect on businesses (IARC, 2009). The recent Cochrane review identified three studies that examined the economic impact of smokefree legislation on the hospitality industry (Callinan et al, 2010). All three found no significant decrease in bar patronage pre and post-legislation, and two of these reported no significant decrease in restaurant attendance, with one study finding a significant increase in the number of non-smokers who attended restaurants (Biener et al, 2007, Gallus et al, 2007, Waa and McGough, 2006).

CONCLUSION

Three years have now passed since the introduction of legislation to make workplaces and public places smokefree in England. The findings from research summarised in this report show that the law has had a significant impact. England's experience and the outcomes observed are very similar to those reported in other countries where smokefree laws have been implemented and research has been conducted to explore impact.

Results from the studies conducted in England show benefits for health, changes in attitudes and behaviour and no clear adverse impact on the hospitality industry. The study of barworkers demonstrated that they experienced large changes in their occupational exposure to SHS, reported improvements in their respiratory health, and were broadly positive about the change to their working conditions following the introduction of smokefree legislation. SHS exposure in children also fell, continuing a positive trend observed since the mid-1990s. Analysis of Hospital Episode Statistics in England showed a significant drop in hospital admissions for heart attacks as a result of smokefree legislation. A qualitative study aiming to assess the behavioural, social and cultural impact of the law showed that it had an immediate and dramatic effect on smoking in enclosed public places across all social groups, north and south, regardless of pre-legislation readiness and attitudes of individuals, organisations and communities. Another study reported that a significantly higher number of smokers in England made a quit attempt as a result of smokefree legislation although further research is needed to identify whether changes in smoking behaviour were sustained in the longer term. Finally, a feasibility study could find no significant evidence of a negative impact on the hospitality industry as a result of smokefree legislation, but emphasised the need for further research when more post-implementation data are available.

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