

Secondhand Smoke

April 2011

This Research Report examines the health effects of exposure to secondhand smoke.

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Definition

Breathing other people's cigarette smoke is known as passive, involuntary or secondhand smoking. It can also be called 'environmental tobacco smoke'. (Note: the term 'secondhand smoke' or 'SHS' has been used throughout this research report.)

Smokers and nonsmokers alike inhale SHS. Inhaling tobacco smoke is an unavoidable consequence of being in a smoke-filled environment.

SHS is a mixture of air-diluted 'sidestream' smoke from the burning tip of a cigarette, and the exhaled 'mainstream' smoke exhaled by the smoker. While the proportions of sidestream and exhaled mainstream smoke can differ, sidestream smoke is usually the larger constituent of SHS.¹

Mainstream smoke inhaled by a smoker contains over 4000 chemicals (both particles and gases), including chemical irritants and almost 70 carcinogens (cancer causing substances). Sidestream smoke has a similar composition but the relative quantities of chemicals can differ.²

Mainstream and sidestream smoke contain fine particles and thousands of gases made up from the combustion of tobacco, paper and additives in a cigarette. The concentration of these chemicals and particles changes over time and in different environmental conditions. The concentration is dependent on the number of smokers, the rate at which they are smoking and the volume of air into which the smoke is distributed.¹

General health effects

Exposure to SHS has immediate health effects. It can reduce lung function; exacerbate respiratory problems; trigger asthma attacks; reduce coronary blood flow; irritate eyes; and cause headaches, coughs, sore throats, dizziness and nausea. A recent study found that as little as one hour's moderate exposure was associated with significantly deteriorated lung function.³

As well as the immediate health effects there are also long-term impacts on health, especially with continued exposure over time. A US Surgeon General report published in June 2006 concluded that there is no risk-free level of exposure to SHS.¹ This report adds to the weight of scientific evidence including a review by the Scientific Committee on Tobacco and Health (SCOTH) in the UK, published in 2004, which concluded that "no infant, child or adult should be exposed to secondhand smoke" and that SHS is a substantial health hazard.⁴

The International Agency for Research on Cancer (IARC) and the World Health Organization (WHO) have classified SHS as a known (class A) human carcinogen. Other class A carcinogens include asbestos, arsenic, benzene and radon gas.²

Evidence about the health impacts of SHS exposure has built up over decades and includes comprehensive reviews by the US National Research Council, reports by the US Surgeon General, the Californian Environmental Protection Agency, the National Health and Medical Research Council of Australia and the Scientific Committee on Smoking and Health in the UK. The WHO also recognises there is no safe level of exposure to SHS.⁵

Since the introduction of smokefree legislation in the UK, living with a person or people who smoke has become the principle cause of exposure to SHS, especially for children. The exposure of the foetus to SHS either through active smoking by the mother or from the mother's own exposure to SHS is also classed by the US Surgeon General as involuntary exposure.

Mortality

In 2003, it was estimated that 617 people in the UK died as a result of exposure to secondhand smoke in the workplace, of which 54 were long term employees of the hospitality industry. Another 11,000 deaths were attributed to secondhand smoke exposure in the home (in adults aged over 20 years).⁶ This accounted for around 2% of the current annual toll from all smoking related deaths in the UK.⁷

In 2005, the California Environmental Protection Agency used population estimates in the US to show the number of annual estimated deaths from SHS exposure. For non-smokers the Agency estimated that:

- around 3,400 people die from lung cancer (ranging from 3,423 to 8,866)
- 46,000 die from cardiac-related illness (range of 22,700 to 69,600)
- 430 children die from sudden infant death syndrome (SIDS).

Another 24,500 babies are born with low birth weight and 71,900 born prematurely. There are around 202,300 episodes of childhood asthma (new cases and exacerbations) and 787,700 cases of middle ear infection in children due to SHS exposure.⁸

The SCOTH report concludes that non-smokers exposed to secondhand smoke have a 24% increased risk of lung cancer and a 25% increased risk of heart disease.⁴

There is evidence to show that incidences of myocardial infarction (heart attack) have fallen since the introduction of Smokefree Legislation.^{9 10 11 12 13} Please see the sections entitled "[Coronary Heart Disease](#)" and "[Health Impact of Smokefree Legislation](#)" for further information.

Lung cancer

Lung cancer has been the most common form of cancer in the world for a number of decades, accounting for 1.61 million new cases and 1.38 million deaths every year.¹⁴ Until recently, lung cancer was also the most frequently occurring cancer in the UK but it has now been overtaken by breast cancer.¹⁵ However, in 2007, 39,470 people were diagnosed with lung cancer and around 35,260 died of the disease in 2008.¹⁶

Lung cancer is the cancer most commonly associated with smoking: around 85-90% of all lung cancers are caused by smoking, or as a result of exposure to secondhand smoke. Because of its poor prognosis, lung cancer is still the most common cause of cancer death, responsible for around 1 in 5 of all cancer deaths in the UK. Less than ten percent of people with lung cancer will survive five years beyond diagnosis.¹⁷

The link between long-term cigarette smoking and lung cancer was established in 1950s.¹⁸ Studies over the past twenty five years have pointed to the causal effect of exposure to SHS and the risk of developing lung cancer amongst non-smokers.

Research published in the International Journal of Cancer in 2003 analysed two large scale studies on the relationship between secondhand smoke exposure and lung cancer risk for non-smokers. The researchers concluded that there were

“Clear dose response relationships consistent with a causal association were observed between exposure to secondhand smoke from spousal, workplace and social sources and the development of lung cancer among never smokers.”¹⁹

In 2004 the International Agency for Research on Cancer (IARC) concluded that a non-smoker living with a smoker has a significantly increased risk of lung cancer, by approximately 24% for women and 37% for men.²

Studies of nonsmokers exposed to SHS in their workplace show an increased risk of lung cancer of the order of 16% to 19% compared to people not exposed.² IARC research has found an exposure-response relationship from living with a smoking spouse and the development of lung cancer. The risk of developing lung cancer in the non-smoking spouse increases with the years spent living with the smoker and the number of cigarettes the smoker consumes.²

IARC states that the evidence is clear: adult non-smokers exposed to SHS have a higher risk of lung cancer than those not exposed. There is also strong evidence of a dose-response relationship between lung cancer risk and the duration of exposure to SHS. The three main sources of SHS exposure are the home, the workplace and the social environment.¹⁹

Coronary heart disease

Studies have consistently shown that exposure to SHS increases the risk of coronary heart disease (CHD) in nonsmokers.²⁰ The 2004 report of the Government appointed Scientific Committee on Tobacco and Health (SCOTH) found that exposure to secondhand smoke is a cause of heart disease. They estimate that there is an increased relative risk of about 25%.²¹ The Institute of Medicine in the United States confirms that exposure to secondhand smoke is a cause of heart disease in non-smokers.²² Other estimates have found an increased risk of between 25-35%.²³

The effects of passive smoke exposure on the heart can be rapid.²⁴ For example, a Japanese study has shown that just 30 minutes of exposure to secondhand smoke by healthy non-smokers can have a measurable impact on a coronary blood flow.²⁵ Exposure to SHS increases blood platelet activity, causing the blood to thicken and become more likely to clot. The tobacco smoke also affects cells lining the coronary arteries, contributing to the narrowing of the arteries. This reduction in blood flow may lead to a heart attack.

In the 1990's heart disease caused by passive smoking was estimated to have been the third leading cause of preventable death in the United States, ranking just behind active smoking and alcohol use.²⁶ A review in 1997 found that nonsmokers had an overall 23% increased risk of heart disease when living with a smoker, even after adjusting for other risk factors such as diet, compared to those people who were not exposed to SHS.²⁷ A British study published in 2004 suggested that CHD in nonsmokers is widespread and that the effects of passive smoking in earlier studies have been underestimated.²⁸

Research has shown that even a brief exposure to environmental smoke increases the tendency of blood to clot, restricting blood flow to the heart, and can produce a serious and even lethal effect on patients with heart disease. The authors of the study recommend that people who are at risk of heart disease should avoid all places that allow smoking indoors.²⁹

Evidence from a number of countries who have introduced smokefree legislation has found that reduced exposure to secondhand smoke leads to a corresponding reduction in hospital admissions for myocardial infarction (heart attack). International studies found a decrease of around 17%.^{30 31}

Chronic respiratory symptoms

The most common outcome of being exposed to SHS according to IARC, is chronic respiratory symptoms in adults.²

A large European prospective study (EPIC) found that exposure to SHS increased the risk of respiratory diseases including Chronic Obstructive Pulmonary Disease (COPD) among former smokers (having stopped for at least 10 years) compared to never smokers, which could indicate a greater

susceptibility of mutations in former smokers (the association was limited to exposure related to work).³²

A 2009 study on the impact of secondhand smoke exposure on obstructive lung disease concluded that

“SHS has a substantive role in causing chronic respiratory disease. Exposure to as little as 1 hour of SHS can cause an acute decline in lung function; longer-term exposure can induce asthma, excessive decline in lung function, and possibly COPD.”³³

Asthma

Asthma is a condition which affects the airways and is the most common chronic disease of childhood. During an asthma “attack”, the walls of the airways tighten and narrow, and the lining of the airways become inflamed and swollen.³⁴ Exposure to secondhand smoke is known to trigger the development of asthma and exacerbate symptoms.³⁵ There are around five and a half million people receiving treatment for asthma in the UK.³⁶

Many studies have shown that people with allergies and/or asthma experience more nasal symptoms, headaches, cough, wheezing, sore throat, hoarseness, eye irritation and aggravation of asthma symptoms due to exposure to SHS.²

There is growing evidence that exposure to secondhand smoke is also a causal factor in adult onset asthma in non-smokers.³⁷

Other health effects of SHS

Stroke

Few epidemiological studies have examined the effects of SHS on stroke or aortic aneurysms. The 2004 SCOTH report found insufficient evidence of an association between SHS exposure and stroke.⁴

Previous research in New Zealand, in 1999, found SHS exposure increased the risk of stroke in non-smokers by 82%.³⁸ Recent research in China has found that non-smoking women living with partners who smoke have an elevated prevalence of stroke. The prevalence increased with intensity of smoking (number of cigarettes smoked) and duration of the partners’ smoking.³⁹ The US Surgeon General has concluded that the risk of stroke and SHS exposure warrants further study.¹

Glucose intolerance and diabetes

Recent research has shown an increased risk of glucose intolerance (a precursor to diabetes) from SHS exposure over a 15 year time period. The incidence of glucose intolerance amongst young adults was 17% among nonsmokers exposed to SHS compared to 12% not exposed to SHS.

Currently, the link between exposure to SHS and diabetes is tentative and needs further research.^{40 41}

Other cancers

As carcinogens have no known safe threshold, it is reasonable to assume that if active smoking is a cause of a specific cancer then passive smoking will impose some degree of increased risk, albeit at a lower level than for active smoking.

SHS exposure has been associated with increased risk of developing cervical tumours (cervical neoplasia). In particular women who have lived with smokers have a 40% increased risk of developing cervical cancer compared to women living with non-smokers.⁴²

The 2004 IARC review confirmed that “the evidence is sufficient to conclude that involuntary smoking is a cause of lung cancer in never smokers.”⁴ The 2010 IARC update reports limited evidence showing an association between exposure to secondhand smoke and cancers of the larynx and pharynx.⁴³ Exposure to secondhand smoke has been linked with bladder cancer.⁴⁴

Other cancers such as leukaemia, nasal and breast may be associated with increased risk from SHS exposure.⁴⁵ However, the epidemiological studies of these cancers and SHS exposure are currently limited.

Sensory irritation

Another common effect of SHS exposure is that of sensory irritation of the eyes, nose and throat, including red eyes, sore throat, coughing or wheezing and hoarseness.

The chemical constituents of SHS that are thought to be responsible for this sensory irritation include organic acids (acetic and propionic acid), aldehydes (formaldehyde and acrolein), nicotine, ammonia, pyridine, toluene, sulphur dioxide and nitrogen oxides. Non-smokers also typically find the odour from tobacco smoke annoying.²

New evidence requiring further research

- There is some new evidence to show that exposure to SHS is associated with depressive symptoms in non-smokers.⁴⁶
- Exposure to SHS during childhood and adulthood may be a risk factor for chronic rhinosinusitis (CRS) with sufferers also reporting worse nasal symptoms and a more use of nasal decongestants compared with unexposed cases. This would suggest that SHS exposure is related to exacerbation and more severe symptoms.⁴⁷

- A 2010 study found an independent association between exposure to secondhand smoke and tuberculosis.⁴⁸ In addition to this, non-smokers exposed to secondhand smoke were reported to be significantly more susceptible to infectious diseases in general including community acquired pneumonia and invasive pneumococcal disease.⁴⁹
- The first study to identify an association between exposure to secondhand smoke and the development of peripheral arterial occlusive disease (PAOD) has been published. PAOD is a surrogate marker for coronary artery disease. The same study also demonstrated that non-smokers exposed to secondhand smoke are nearly 60% more likely to have an ischemic stroke than non-smokers who are not exposed to SHS.⁵⁰
- A cross-sectional analysis of population based study published in 2009 found that exposure to secondhand smoke may be associated with cognitive impairment.⁵¹

Health effects of SHS on children

The World Health Organization has estimated that nearly 700 million, or almost half of the world's children, are exposed to tobacco smoke by the 1.2 billion adults who smoke.⁵²

In the UK, surveys in the 1980s and 1990s found that about half of all children lived in a house where at least one person smokes.⁵³ By early 2007 this figure had dropped to 40%.⁵⁴ Since the introduction of smokefree legislation in the United Kingdom, this figure has continued to fall.⁵⁵ At the same time, the proportion of children living in smokefree homes has risen from 21% in 1996 to 37% in 2007.⁵⁶ However, for many children who live in smoking households, there has been little reduction in smoke exposure.

For young children, the major source of tobacco smoke is smoking by parents and other household members. Maternal smoking is usually the largest source of SHS because of the cumulative effect of exposure during pregnancy and close proximity to the mother during early life.

Secondhand smoke in the home is a major source of exposure because children spend most of their time at home and indoors. Unlike adults who can choose whether or not to be in a smoky environment, children have little choice. They are far less likely to be able to leave a smoke-filled room if they want to: babies cannot ask; some children may not feel confident about raising the subject; and others may not be allowed to leave even if they do ask.

Health Impact on children

In 2010 The Royal College of Physicians published a landmark report entitled “Passive Smoking and Children”. The report acknowledges the importance of smokefree legislation in reducing exposure to secondhand smoke in the workplace but points out that the principle source of exposure for non-smokers is in the home and that children are especially at risk.⁵⁷

The authors note that *“Passive smoking in the home is a major hazard to the health of the millions of children in the UK who live with smokers, and the extent of this health problem has not, to date, been accurately quantified.”* They conclude that *“passive smoking is a significant cause of morbidity and mortality in babies and children.”*

The report affirms that a child exposed to SHS has an increased risk of asthma, lower respiratory infections, bronchitis, middle ear disease, bacterial meningitis and sudden infant death syndrome (SIDs as well as general reduced respiratory function (cough, wheezes). These disorders generate over 300,000 UK GP consultations and about 9,500 hospital admissions every year, costing the NHS about £23.3 million.

The report echoes the findings of a review published by the World Health Organization in 1999 which also found that passive smoking is a cause of bronchitis, pneumonia, coughing and wheezing, asthma attacks, middle ear infection, cot death, and possibly cardiovascular and neurobiological impairment in children.⁵⁸ These findings were confirmed in the SCOTH Report in 2004.⁵⁹

Children are especially vulnerable to SHS as they breathe more rapidly and inhale more pollutants per pound of body weight (a higher relative ventilation rate) than adults.⁶⁰

Children’s exposure to SHS can be affected by:

- the number of smokers at home
- the number of cigarettes being smoked
- the level of parents’ education
- where the parents or others smoke in the house.⁶¹

A study published by the American Academy of Pediatrics in 2009 found that “secondhand tobacco smoke (SHS) exposure of children and their families causes significant morbidity and mortality,” citing strong evidence which supports the association of SHS exposure of children with respiratory illnesses, middle-ear infections, tonsillectomy and adenoidectomy, cough, asthma and asthma exacerbations, hospitalizations, and sudden infant death syndrome. According to the study, SHS has also been associated with the exacerbation of many chronic illnesses such as sickle cell disease.⁶²

Passive smoking increases the risk of lower respiratory tract infections such as bronchitis, pneumonia and bronchiolitis in children. One study found that in

households where both parents smoke, young children have a 72% increased risk of respiratory illnesses.⁶³ Passive smoking causes a reduction in lung function and increased severity in the symptoms of asthma in children, and is a risk factor for new cases of asthma in children.^{64 65} Passive smoking is also associated with middle ear infection as well as possible cardiovascular impairment and behavioural problems.⁶⁶

Infants of parents who smoke are more likely to be admitted to hospital for bronchitis and pneumonia in the first year of life.⁶⁷ Passive smoking during childhood predisposes children to developing chronic obstructive airway disease and cancer as adults.⁶⁷

Exposure to tobacco smoke may impair olfactory function in children. A Canadian study found that passive smoking reduced children's ability to detect a wide variety of odours compared with children raised in non-smoking households.⁶⁸

Exposure to secondhand smoke may also affect children's mental development. A US study found deficits in reading and reasoning skills among children even at low levels of smoke exposure.⁶⁹ There is also some evidence to suggest that exposure to SHS can lead to increased school absenteeism.^{70 71}

Children are more likely to commence smoking if they grow up in households where those around them smoke and are more likely to smoke if one or both of their parents do.⁴⁵ Conversely, young adults who lived in smokefree homes as children are much more likely to prefer to live in smokefree accommodation once they leave home.⁷²

Cancer

A report by the British Medical Association found that there is suggestive evidence that exposure to SHS causes childhood cancer (in particular brain cancer and lymphoma) and meningitis. It can also lead to cancer in adulthood and the initiation and progression of cardiovascular disease.⁷³

A study in Sweden revealed that parents who smoke are greatly increasing their child's risk of developing several types of cancer. Similar risks for exposure by mothers and fathers smoking were found for lung cancer (71%), and throat cancer (45%). There was an 8-fold increased risk of developing nasal cancer (nasal adenoid cystic carcinoma) by exposure to SHS from either parent during childhood.⁷⁴

Children who are exposed to SHS on a daily basis grow up with more than triple the risk of lung cancer later in life compared to those who grow up in smokefree environments.⁷⁵

Emphysema in adulthood

A study published in 2009 found an association between childhood exposure to SHS and the development of emphysema in adulthood. The findings suggest that the lungs may not recover completely from the effects of early-life exposure.⁷⁶

Asthma

Asthma is the most common chronic disease of childhood. SHS exposure can trigger the development of asthma and exacerbate symptoms.⁷⁷

Three potential modifiable causes of asthma have been identified by researchers. These include: exposure to SHS, lack of dietary fruit intake (fruit intake is related to increased lung function) and the proximity of the home to a main road. A UK study found no association between living close to a main road and asthma, a moderate increased risk for children who consume no fruit, and an exposure-dose response relationship between smoking and asthma. Parental smoking was a causal factor of asthma in children and the prevalence of asthma increased with the number of smokers in the home. The authors found that of the three preventable risk factors, SHS exposure was the independent determinant of the disease.⁷⁸

Children who suffer from asthma and whose parents smoke are at least twice as likely to suffer asthma symptoms all year round compared to the children of non-smokers. Wheeze and physician-diagnosed asthma was more common in children who lived with a smoker.

An effective means of preventing asthma is to reduce the person's exposure to SHS.^{77 78}

More information

Further information on effects on children of SHS can be found in ASH's Research Report: [Secondhand smoke: Impact on children](#). See also [Passive smoking and children](#). A report by the Tobacco Advisory Group of the Royal College of Physicians. London, RCP, 2010.

Health effects of prenatal exposure to SHS

Prenatal exposure to tobacco smoke has adverse impacts on the health of the foetus including low birth weight, premature birth, spontaneous abortion and still birth.

Babies born to women who smoke weigh around 200 grams less than non-smokers. There is also a small adverse effect on the baby's weight of non-smoking mothers who themselves have been exposed to SHS during their pregnancy.² Smoking also impacts on IVF and fertility rates. It has been found that exposure to SHS is as damaging as smoking itself in terms of successful pregnancy outcomes for people using IVF.⁷⁹

Prenatal exposure can have adverse impacts on the learning and behavioural development of a child. Maternal prenatal smoking is associated with both antisocial behaviour and attention deficit hyperactivity disorder (ADHD) in children and adolescents.⁸⁰ This association remains after controlling for confounders such as socio-economic status, maternal age, birth weight and maternal psychopathology.

Impact of exposure to SHS on pregnant women

A review of studies published in 2009 examining the impact of secondhand smoke exposure on non-smoking pregnant women found that there was a small risk of them having lighter weight babies and of the babies having congenital abnormalities.⁸¹ The authors concluded that for most women the risks were small but that for active smokers or those in poor health the added risk of exposure to SHS may be more significant.

However, earlier studies found babies born to non-smoking women whose partners smoked weighed less than babies born to non-smoking couples.⁸² Moreover, women exposed to secondhand smoke in the workplace were also affected.⁸³ A review of the evidence concluded that on average, infants born to women exposed to secondhand smoke during pregnancy are 40-50g lighter than those born to women who are not exposed.⁸⁴ Other research suggests that non-smoking women who are exposed to SHS during their pregnancy are at increased risk of giving birth prematurely⁸⁵ and may be at increased risk of spontaneous abortion (miscarriage).⁸⁶

There is also some evidence which suggests that female fertility can be damaged in utero if the woman's mother was exposed to secondhand smoke while pregnant.⁸⁷

Exposure to secondhand smoke in cars

Levels of secondhand smoke in cars can be extremely high because of the restricted area in which the smoke is circulated.⁸⁸ One study found significantly increased levels of blood carboxyhemoglobin (carbon monoxide in the blood) in individuals exposed to the smoke of as few as three cigarettes in an enclosed vehicle.⁸⁹

The California Environmental Protection Agency warns that

- cigarette smoke particle exposure in a closed car is comparable to the exposure a firefighter might receive over four to eight hours fighting a California wildfire.
- one smoker emits five times more fine particles into a car than are emitted per-mile by the car's exhaust pipe.

- secondhand smoke in cars can be ten times more concentrated than the level considered “unhealthy” by the US Environmental Protection Agency.⁹⁰

In 2005, The State of California’s Air Resources Board (CARB) conducted a comprehensive review of studies which measured secondhand smoke particle concentrations in a variety of environments. The review found that in-car concentrations were up to 60 times greater than in a smoke-free home, and up to 27 times greater than in a smoker’s home.⁹¹

A study comparing secondhand smoke particle concentrations in a vehicle with those in a bar which allowed smoking, found in-vehicle concentrations 20-times greater than inside the bar.⁹² A Harvard University study which measured air quality in passenger cars under actual driving conditions found unsafe levels of secondhand smoke, especially for children.⁹³

Why opening a window won’t help

Opening a window does not reduce the levels of secondhand smoke in a car to a safe level as the smoke simply blows back into the vehicle, often lingering for hours. A US study examined 100 different air change rate measurements in four vehicles. Results showed that under all ventilation circumstances, even with windows open and the fan on high, SHS concentrations in a vehicle were greater than in any other small enclosed place.⁹⁴

In the Stanford Report discussing the study, one of the researchers noted that

“even with a car's windows open, smoke particle concentrations were higher than the levels measured in California bars during studies in the mid-1990s before the state banned smoking in taverns.”⁹⁵

Smoking in cars with children

An Australian study found that children exposed to secondhand smoke in their parents’ car had double the risk of persistent wheeze compared to children who had not been exposed.⁹⁶

In addition to the physical risks faced by children exposed to secondhand smoke in cars, there are wider social issues to consider. Observational studies examining the prevalence of smoking in cars by socioeconomic area suggests that children in lower socio-economic groups are likely to receive more frequent exposure than other children, compounding the already unacceptable health inequalities faced by these children.⁹⁷

Some experts argue that it is ethically justifiable to ban smoking in cars carrying children because children are not fully autonomous and are therefore unable to act to protect their own interests.⁹⁸

Public opinion on smoking in cars

Since the introduction of smokefree legislation in 2007, public support for a ban on smoking in cars has been growing, especially when children are present.

- A YouGov poll in 2009 found majority support among adults in England for a ban on smoking in cars.⁹⁹
- A YouGov poll published by the Faculty of Public Health in August 2010 found 74% support for a ban on smoking in cars with children.¹⁰⁰
- A survey conducted by GEM Motoring Assist (formerly The Guild of Experienced Motorists) found a considerable majority (72%) in favour of a complete ban on smoking while driving in the UK.¹⁰¹
- Polls publicised by Road Safety GB and Channel 4 in 2007 showed that 70% of respondents supported a complete ban on smoking in cars in the UK.^{102 103}
- In Australia, a public opinion survey in 2005 showed that 90% of Australians supported the banning of smoking in cars carrying children.¹⁰⁴
- An international review of surveys from North America, the UK and Australasia found a majority (76%) of the public supported the introduction of smokefree car laws. In four of the jurisdictions examined (Victoria, California, New Zealand, and South Australia) levels of public support were in excess of 90%.¹⁰⁵

International laws

Laws banning smoking in cars carrying children have been introduced in a number of jurisdictions in Canada, the United States and Australia, with others expected to introduce similar laws in the near future. South Africa recently introduced a country-wide ban on smoking in cars with children.

There are also a growing number of countries which ban smoking in vehicles used for work purposes, including Chile and Germany while in Kuwait it is against the law to smoke while driving in any vehicle.¹⁰⁵

Awareness of health risk

There is a high degree of overall awareness about the health risks of SHS amongst UK adults with around 80% believing that a non-smoker's risk of lung cancer, bronchitis and asthma is increased by SHS exposure. Slightly fewer (76%) believe that SHS increases the risk of heart disease.¹⁰⁶

Younger people (ie aged under 35) and those who have never smoked are more likely to know about the health effects of passive smoking on adults and children.¹⁰⁶

Around 62% of non smokers dislike people smoking around them. Women who did not smoke were more likely to mind others smoking near them than

men who did not smoke (64% compared with 59%). Those who have never smoked regularly were more likely to mind people smoking near them than ex-regular smokers (67% and 53% respectively).¹⁰⁶

People do not like the smell of cigarettes (65%); or the smell of smoke on clothes (53%). 51% also reported adverse health reactions due to SHS including: effects on their breathing; coughing; eye irritation and feeling sick.¹⁰⁷

There is a high level of awareness about the impact of secondhand smoke on children: 92% of adults are aware that exposure to SHS increases a child's risk of chest infections and 86% are aware of an increased risk of asthma. People are less likely to be aware of the risks associated with cot deaths (58% thought there was an increased risk) but only 35% believed there was an increased risk of ear infections in children living with a smoker.¹⁰⁶

The Health Act 2006: Smokefree Legislation

Since the implementation of the smokefree provisions of the Health Act in 2007, smoking in enclosed public places and workplaces is prohibited across the United Kingdom.

Health Impact of Smokefree Legislation

The 2008-09 smoking related behaviour and attitudes survey found that 69% of people surveyed do not allow smoking inside their home, compared to 61% in 2006. A further 20% only allow smoking in certain rooms or at certain times. Only 10% allow smoking to take place anywhere in their homes.¹⁰⁸

There is consistent evidence to show that in countries where comprehensive smokefree legislation has been implemented, reductions in secondhand smoke exposure of between 80% and 90% have been recorded.¹⁰⁹ In addition to improved respiratory function, there has been a notable decline in admissions to hospital for heart attack. A review of recent studies found an overall decrease in acute myocardial infarction of 17% following the implementation of smokefree legislation.^{110 111}

A study in Ireland found that hospitality workers experienced significant reductions in both air nicotine levels (80% drop) and saliva cotinine concentrations (70% decrease) during the first six weeks of the Irish smoking ban. Cotinine is produced by the body while it is breaking down nicotine and indicates recent passive smoking exposure. Before the law came into effect, 68% of workers reported having over 21 hours of SHS exposure per week. After the introduction of the ban this changed to 70% of workers reporting no exposure to SHS per week.¹¹²

New York State implemented the *Clean Indoor Air Act* in 2003. After the ban there was a marked reduction in reported exposure by hospitality employees

to SHS. Study subjects reported an 89% decrease in exposure to SHS at work; this was confirmed by urinary cotinine tests of the workers.¹¹³

A 2008 review of smokefree legislation across Europe concluded that the laws

“are well accepted by the public, lead to a significant decrease of exposure to second hand smoking in public places and have the potential to contribute to the reduction in overall cigarette consumption. Researchers documented important short-term effects on the respiratory system health of workers from the bars and restaurants after the introduction of the law. Moreover, important short-term effects on the rates of hospital admission for acute myocardial infarction were observed.”¹¹⁴

Public support for smokefree legislation:

- The Department of Health carried out a survey in 2008 which found that 76% of respondents supported smokefree legislation in England.¹¹⁵
- The 2008/9 edition of the “Smoking-related behaviour and attitudes” survey found that 85% of respondents supported restrictions on smoking at work, 93% in restaurants, 91% for indoor shopping centres, 94% for indoor sport and leisure centres. Seventy-five percent of those interviewed supported the ban on smoking in pubs.¹¹⁶
- Monthly surveys conducted on behalf of the Government since the ban have revealed that 98% of businesses are compliant with the law and 81% believe the legislation is a “good idea”.¹¹⁷
- A MRUK survey carried out on behalf of the Scottish government in 2006 found that 91% of non-smokers supported smokefree legislation.¹¹⁸
- There is international evidence which suggests that following a period of uncertainty in the lead up to the introduction of smokefree legislation, the laws are readily accepted, popular with the public and have high rates of compliance.¹¹⁹
- Surveys suggest there is strong support for the introduction of a law banning smoking in cars with children.^{120 121}

More information

[ASH fact sheet on Smokefree Legislation](#)

[Smokefree England](#)

[Clearing the Air Scotland](#)

[Smoking Ban Wales](#)

[Space to Breathe for Northern Ireland](#)

[Smokefree England Regulations](#)

[The Smoke-free \(Premises and Enforcement\) Regulations 2006](#)

Conclusion

Exposure to SHS is a major public health issue and a significant health risk. The 2006 US Surgeon General report shows social norms regarding SHS exposure have changed dramatically since the Royal College of Physicians report¹²² on smoking in 1962 and that this is leading towards a society free from SHS exposure.

The health risks from SHS exposure are now well documented and there is no risk-free level of exposure to SHS.¹²³

The 2006 US Surgeon General report identified six major conclusions:

1. Millions of people continue to be exposed to SHS in their homes, workplaces or social situations
2. SHS causes premature death and disease in child and adults who do not smoke
3. Children exposed to SHS are at increased risk of SIDS, respiratory infections, ear problems and asthma.
4. Exposure of adults to SHS has immediate adverse effects on the cardiovascular system, can cause coronary heart disease and lung cancer
5. There is no risk-free level of exposure to SHS
6. Eliminating smoking from indoor areas fully protects nonsmokers. Separating smokers and nonsmokers, ventilation or cleaning the air cannot eliminate exposure of nonsmokers to SHS.¹²⁴

In December 2010, the Government published its Public Health White Paper "Healthy Lives, Healthy People: our strategy for public health in England" which included a commitment to publish a tobacco control plan.¹²⁵ The latter was published in March 2011. The Tobacco Control Plan for England¹²⁶ sets out the Government's plans to further reduce people's exposure to secondhand smoke. Specifically the Government has pledged to:

- Work with national media to raise awareness of the risks in exposing children to secondhand smoke;
- Support local areas to encourage smokers to change their behaviour so that they do not smoke in their homes or family cars;
- Continue progress to reduce secondhand smoke in prisons; and
- Support other countries that want to introduce smokefree laws by sharing UK experience.

The Government has also published a review of the evidence of the health impact of smokefree legislation.¹²⁷

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