

BACKGROUND BRIEF

Further Information

Secondhand smoke

Over the past 30 years, a growing body of scientific evidence has concluded that secondhand smoke can harm the health of non-smokers.¹ As this became accepted by the public, smokers' arguments on their right to light up were overtaken by the rights of the non-smoking majority to be protected from other people's tobacco smoke.

What is secondhand smoke?

The process of smoking produces three different types of tobacco smoke:¹

1. Mainstream smoke

This is smoke directly inhaled by the smoker through a burning cigarette.

2. Exhaled mainstream smoke

This is smoke breathed out by the smoker.

3. Sidestream smoke

This is smoke which drifts from the burning end of a cigarette.

Secondhand smoke (SHS) is the combination of exhaled mainstream smoke and sidestream smoke. Secondhand smoke is also called environmental tobacco smoke (ETS). Breathing in secondhand smoke is also referred to as passive smoking.¹

Secondhand smoke affects the health of both non-smokers and smokers. There are at least 250 chemicals in secondhand smoke that are known to be toxic, including more than 50 that are known to cause cancer.¹

Sidestream smoke contains a range of chemicals similar to mainstream smoke.^{1,2} However, the amounts of certain chemicals found in sidestream smoke are different to mainstream smoke.^{1,2} In some cases their levels are more than ten times higher than in the smoke inhaled by the smoker.¹ For example, compared to mainstream smoke, sidestream smoke contains greater amounts of ammonia, acrolein, carbon monoxide, nicotine and a number of cancer causing chemicals, per cigarette.^{2,3}

However, sidestream smoke is diluted by being mixed with air before being inhaled.¹ People breathing in secondhand smoke receive lower levels of toxic chemicals than active smokers, who draw the tobacco smoke directly into their lungs. This means active smoking is more dangerous to health than breathing in secondhand smoke.

Diseases related to secondhand smoke

Secondhand smoke causes early death and disease in children and in adults who do not smoke.¹ The more secondhand smoke to which you are exposed, the higher your risk of disease.^{1,3} There is no level of exposure to secondhand smoke that is free of risk.¹

Reviews of the research conclude that secondhand smoke causes the following diseases and conditions:¹

In adults

- Heart disease
- Lung cancer
- Irritation of the eyes and nose^{3,4}

In children and infants

- Sudden infant death syndrome (SIDS or cot death)
- Lower birthweight (where the pregnant mother was exposed to SHS)
- Bronchitis, pneumonia and other lung/airways infections
- Wheeze illnesses in early childhood
- Middle ear disease (otitis media or 'glue ear', middle ear effusion)
- Respiratory symptoms including cough, phlegm, wheeze and breathlessness
- Higher rates and worsening of asthma
- Lower level of lung function during childhood (i.e. they cannot breathe in as deeply or breathe out as hard as they would otherwise)

Research also links exposure to secondhand smoke to other diseases and conditions. They include:¹

In adults

- Nasal sinus cancer
- Breast cancer
- Stroke
- Atherosclerosis (disease of the blood vessels)
- Acute (short term) respiratory symptoms including cough, wheeze, chest tightness and difficulty breathing among both healthy persons and persons with asthma
- Chronic (long term) respiratory symptoms
- Acute (short term) decline in lung function in persons with asthma
- Small loss of lung function
- Development of asthma and worsening of asthma control
- Chronic obstructive pulmonary disease (COPD)

In children and infants

- Development of asthma
- Preterm delivery (where the pregnant mother was exposed to SHS)
- Childhood cancers: leukemias, brain cancer and lymphomas (where both the pregnant mother and the child after birth were exposed to SHS)
- Lung complications during and after surgery^{5,6}
- Worsening of cystic fibrosis⁴
- Meningococcal disease^{7,8,9,10}

Heart disease

Secondhand smoke increases the risk of coronary heart disease in non-smokers. Non-smokers with long term exposure to tobacco smoking in their home have an estimated 25% to 30% increased risk of heart disease compared to non-exposed non-smokers.¹ This increased risk of heart disease from SHS is about one-third the increased risk of active smoking.^{1,11} Low levels of tobacco smoke appear to have a strong effect on heart disease risk, but the risk tends to level off at the higher exposures of smoke incurred by active smokers.⁴ Levels of chemicals known to play a role in heart disease are higher in sidestream smoke than in the mainstream smoke inhaled by smokers.⁴ Research also indicates that non-smokers are more sensitive to certain effects of SHS than active smokers.¹

Secondhand smoke interferes with the normal workings of the heart, blood and blood vessels, causing both short and long term damage.¹ Some effects occur within as little as 30 minutes, and appear to be nearly as large as those seen in an active smoker.^{1,12} For example, secondhand smoke affects the lining of your blood vessel walls and interferes with the way they regulate blood flow. It makes your blood thicker, stickier and more likely to clot. Carbon monoxide from SHS replaces some of the oxygen in your blood, reducing the delivery of oxygen to your heart and muscles. With less oxygen, short-term or permanent damage to your heart and tissues is more likely. Over many years, the damaging effects of secondhand smoke help to build up fatty deposits on blood vessel walls, narrowing and stiffening them, and causing inflammation. Eventually this may lead to heart attack.^{1,4,12}

The majority of deaths from secondhand smoke are from heart disease.¹³ People with other risk factors for heart disease such as diabetes, high blood pressure, and vascular disease are at even greater risk from SHS exposure.⁴

Cancer

Secondhand smoke has been confirmed as a cause of cancer in humans.^{1,2,14,15}

Secondhand smoke is a cause of lung cancer in non-smokers. Non-smokers with long term exposure to tobacco smoke have an estimated 20% to 30% higher risk of developing lung cancer than non-exposed non-smokers.¹

The evidence suggests that secondhand smoke may be a cause of nasal sinus cancer and breast cancer in younger women (before menopause), but more research is needed before these findings can be confirmed.¹⁴ Breast cancer is the most common cancer and the leading cause of cancer death among Australian women.¹⁶

Impact on the health of workers

Studies in both workplace and restaurant settings confirm that only those policies that require establishments to be totally smokefree adequately protect non-smokers from exposure to SHS.¹⁷ In March 2006, most indoor Victorian workplaces became smokefree. On July 1st 2007, smoking was banned in enclosed indoor premises with liquor licenses including pubs, bars and nightclubs. The “high-roller” rooms at Crown Casino remain the last places in Victoria where indoor workers in licensed premises are exposed to SHS.

Previously, Victorian hospitality workers were more likely to work in smoky areas that tended to have higher levels of tobacco smoke than other workplaces.^{18,19} As a result, they were more likely to suffer from health problems such as wheezing, coughing, sore eyes and sore throats.²⁰ Importantly, research also shows that when smoking is banned in indoor venues, the health of bar staff improves, even in smokers.²¹

Smoking is still allowed in outdoor dining and drinking or ‘al fresco’ areas. The legislation allows for these areas to have a roof and up to 75% of the wallspace to be enclosed.²² It remains to be seen if SHS continues to be a problem at these venues.

Effects on the unborn child

When a pregnant woman breathes in secondhand smoke, chemicals from the smoke can pass through her lungs into the bloodstream. Nicotine, carbon monoxide and other chemicals can cross the placenta affecting her unborn child.¹ Women exposed to secondhand smoke are more likely to have a baby with a low birthweight of less than 2,500g.¹ Overall, babies who are born to mothers exposed to SHS have a slightly lower birthweight than they would otherwise. This would not necessarily adversely affect a healthy baby, but could further compromise a baby with other problems.¹

The baby of a mother exposed to SHS may also be more likely to have preterm birth, meaning they are carried for less than 37 weeks.¹

For effects on the unborn child from actively smoking while pregnant, see the *Background Brief: Smoking and Pregnancy* available from quit.org.au.

Health effects on infants and children

Children are especially vulnerable to secondhand smoke. It is estimated that 23 Australian children under the age of fifteen died from illnesses related to secondhand smoke in 1998.²³ In households where at least one parent smokes, the best way to protect children from secondhand smoke is by parents ensuring a total ban on smoking inside the home and car.²⁴

Infants exposed to secondhand smoke have a greater risk for SIDS (Sudden Infant Death Syndrome or cot death).¹ SIDS researchers have recommended that mothers who smoke should not share a bed with their babies aged under four months old.^{25,26}

The children of parents who smoke have higher rates of lung or airways infections such as bronchitis, bronchiolitis and pneumonia during their first two years of life compared to children of non-smokers.^{1,4} They are also more likely to develop wheeze illnesses.¹ Children in this age group exposed to secondhand smoke have higher rates of admission to hospital.^{27,28}

Children of smokers are more likely to contract 'glue ear' (otitis media), which is an infection and swelling of the ear common in young children. Children of smokers are more likely to have 'glue ear' multiple times and to have long-term middle ear effusion (leaking of fluid).¹ Middle ear disease is a common cause of hearing loss in children, which can delay speech development.^{4,29}

Children of smokers have a small lowering in lung function, meaning that on average, they cannot breathe in as deeply or breathe out as hard compared to children of non-smokers.¹ Children of all ages are affected, including adolescents, and some evidence suggests that reduced lung function may even persist into adulthood.^{1,4}

School-aged children of smokers are more likely to have symptoms such as cough, phlegm, wheeze, and breathlessness.¹ Asthma is more common among children of smokers. Children with asthma exposed to secondhand smoke have a greater risk of developing symptoms earlier in life, and having more symptoms and asthma attacks.^{1,4} They are more likely to use asthma medications more often and for a longer period.⁴

Secondhand smoke appears to impair the immune system in both children and adult non-smokers, which increases their risk of infection.¹ Children exposed to secondhand smoke are more likely to have lung complications during and after surgery involving a general anaesthetic.^{5,6} Children of smokers have an increased risk of meningococcal disease, which can sometimes cause death, mental disability, hearing loss, or loss of a limb.^{7,8,9,10,30} Smokers are more likely to be carriers of the bacteria that causes this disease.¹⁰

Some evidence suggests that when a pregnant mother and a child is exposed to secondhand smoke before and after birth, her child may have an increased risk for certain childhood cancers, such as leukemias, lymphomas and brain cancer. More research is needed before this can be confirmed.¹

Effects of secondhand smoke that can lead to heart disease may begin in childhood and adolescence.¹

Even though some symptoms from SHS become less common with age, it is still important to protect children of all ages from secondhand smoke.¹

Public opinion about secondhand smoke

Since the 1980s The Cancer Council Victoria has conducted several surveys with the Victorian public on their knowledge of the health risks of secondhand smoke, and their attitudes towards introducing smokefree areas. These surveys have consistently shown that a majority of smokers, as well as non-smokers, believe that secondhand smoke is harmful to health.^{31,32}

The percentage of smokers who said they did not smoke at all if they were around children increased from 13% in 1989 to 51% in 2001.³³

In a 2000/2001 survey, 32% of respondents said they had a health problem that was aggravated by tobacco smoke, and more than half (59%) said that they tried to avoid smoky places.³³ In a 2004 survey, 80% of respondents, including over half of smokers, said they had some level of concern about being exposed to secondhand smoke.³²

In a 2004 survey, over 80% of non-smokers and ex-smokers approved of legislation that banned smoking in bars, nightclubs and gaming venues. Support among smokers for such legislation varied between 48% for bars and 66% for gaming venues.³⁴ However, past experience shows that support for smokefree legislation from smokers can rise after the smoking bans are put in place. For example, support among smokers for Victorian legislation making restaurants smokefree rose from 53% three months before the smoking ban, to 70% four months after its introduction on 1st July 2001.³³ The percentage of smokers who disagreed with the legislation decreased from 33% to 17% during the same period.^{33,35}

Since 2000, there has been an increase in the percentage of Victorians who approve of the government banning smoking in bars, gaming venues and nightclubs.^{34,36} (Table 1) Response to a 2004 survey suggests that overall there will be an increase in patronage in these venues now that total smoking bans have been introduced.³⁴

Table 1
Support for the government banning smoking in gaming venues, bars and nightclubs in 2000 and 2004^{34,36}

Year	Gaming venues		Bars		Nightclubs	
	2000	2004	2000	2004	2000	2004
Approve	66%	85%	57%	79%	54%	80%
Neither approve nor disapprove	10%	5%	11%	5%	14%	6%
Disapprove	18%	9%	31%	15%	26%	11%
Can't say	2%	1%	2%	1%	4%	3%

Due to rounding not all columns sum to 100.

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