

# Chapter 9

## Summary

### Health effects of exposure to SHS

This chapter describes the findings and conclusions of review groups that have conducted comprehensive assessments of the health effects of exposure to SHS. Over the four decades that research findings on SHS and health have been reported, increasingly stronger conclusions of reviewing groups have progressively motivated the development of protective policies. The rationale for such policies is solidly grounded in the conclusions of a number of authoritative groups that SHS exposure contributes to the causation of cancer, cardiovascular disease, and respiratory conditions.

The Working Group found a high degree of convergence of the research findings. In fact, since 1986, an increasing number of reports have added to an ever growing list of causal effects of SHS exposure. These reports have given exhaustive consideration to the epidemiological findings and the wide range of research supporting the plausibility of causal associations. They have also considered and rejected explanations other than causation for the associations observed in the epidemiological studies. Particular attention has been given to confounding by other risk factors and

to exposure misclassification, both of active smoking status and of exposure to SHS.

#### **Conclusions**

Exposure to SHS causes harm to health, including lung cancer and cardiovascular disease in adults, respiratory disease in adults and children, and Sudden Infant Death Syndrome (SIDS), as reported by numerous authoritative scientific review groups. As concluded by the US Surgeon General, there is no established risk-free level of SHS exposure. SHS exposure has both acute and chronic health effects; consequently, both immediate and longer-term benefits to public health can be anticipated from implementing the recommended smoke-free policies.

#### **Evolution of smoke-free policies**

The guidelines for the implementation of Article 8 of the WHO's Framework Convention on Tobacco Control (FCTC) provide public health officials and policymakers with a clear description of the elements of a smoke-free policy that offer effective

protection from SHS. An effective smoke-free policy should create 100% smoke-free spaces by law in all indoor public and workplaces, public transportation, and, as appropriate, other public places. The policy should emphasise that protection from exposure to SHS is a basic right, and that protection should be universal and ensure 100% smoke-free environments, as opposed to protecting only targeted populations or permitting smoking in restricted areas. An organised strategy for public education and enforcement is critical for successful implementation.

The historical development of smoke-free environments began in the mid-1970s and expanded in the 1990s. Beginning in the early 1980s, results of scientific studies and governmental and intergovernmental reports provided the information needed to advance smoke-free policies. However, there was no information on the ideal components of such a policy due to the lack of experience at that time. The early experience of multiple jurisdictions in the USA as well as in Australia and Canada provided case studies on the effectiveness of smoke-free policies.

In the 21st century, the number of countries passing 100% smoke-free legislation started to grow rapidly. In 2004, Ireland became the first country in the world to implement a 100% smoke-free policy in all indoor public and workplaces, including restaurants and bars.

### **Conclusions**

As of January 2008, sixteen countries and dozens of sub-national jurisdictions have implemented model legislation. Passing a policy is only one part of the process of protecting a population from exposure to secondhand smoke; both public education and enforcement efforts are necessary when the smoke-free policy is implemented. The need for enforcement efforts usually decreases after the policy is established, as it typically becomes self-enforcing.

### **Economic impact and incidental effects**

Smoke-free policies affect businesses in numerous ways, from improving the health and productivity of their employees to reducing their health and hazard insurance claims, cleaning of workplace environments, maintenance of designated smoking rooms, and potential litigation costs. Studies suggest that there are minimal short-term costs to businesses to implement comprehensive smoke-free policies. Existing evidence from developed countries indicates that smoke-free workplace policies have a net positive effect on businesses; the same is likely to be the case in developing countries. Establishing and maintaining designated indoor

or outdoor smoking areas is more costly to implement than a completely smoke-free policy. There are minimal costs to governments related to enforcement and education about smoke-free policies.

Much of the debate over the economic impact of smoke-free policies, and as a result, much of the research, has focused on the hospitality sector. Methodologically sound research from developed countries consistently concludes that smoke-free policies do not have an adverse economic impact on the business activity of restaurants, bars, or establishments catering to tourists, with many studies finding a small positive effect of these policies. These studies include outcomes such as official reports of sales, changes in employment statistics, and the number of businesses opening and closing. Very limited evidence from South Africa, an upper middle-resource country, is consistent with these findings. It is likely that the same would be true in other developing countries; nevertheless, research confirming this would be useful as smoke-free policies are adopted in a growing number of countries. There are very few studies on the effects of smoke-free policies on various problem behaviours, including other substance use and its consequences, problem gambling, domestic violence, noise, and litter with findings inconclusive at this time.

### **Conclusions**

Smoke-free policies do not cause a decline in the business activity of the restaurant and bar industry.

### **Attitudes and compliance**

In developed countries, majority public support for smoke-free policies is typical for public and workplaces (including hospitality settings), and a range of other settings (e.g. schools and health care facilities). There is some suggestion that countries that use public education campaigns when enacting smoke-free laws achieve higher levels of support.

In developing countries, the Global Youth Tobacco Survey (GYTS) has identified majority student support for smoke-free policies in public places. Likewise, studies have shown majority adult support for smoke-free public and workplaces.

Trend data on attitudes indicate increasing support for smoke-free policies over time in nearly all settings. This also occurs after the implementation of smoke-free policies.

Smokers usually comply with smoke-free policies, but the level of compliance can vary widely. Non-compliance may be related to a lack of awareness or poor enforcement of the policy.

Studies in developed countries also indicate majority public support for smoke-free cars, parks, sports facilities, and transition areas, such as building entryways.

### **Conclusions**

There is usually majority support for smoke-free public and workplaces. Public support among both smokers and nonsmokers for smoke-free policies increases following implementation of legislation. When smoke-free policies are implemented

as described in the WHO FCTC guidelines, compliance is moderate to high.

### **Reductions in exposure to SHS and health effects**

In the past, voluntary restrictions on smoking in the workplace have been an important vehicle for reducing exposure to SHS in many countries. However, such restrictions have uneven coverage, are generally not applied in some of the highest-exposure settings (such as bars and gaming venues), typically offer little protection for groups in the working population with the poorest health status, and therefore increase the likelihood of widening health inequalities. Comprehensive, mandatory restrictions do not have these shortcomings.

Studies of smoke-free legislation, that prohibits smoking in virtually all indoor workplaces, consistently demonstrate reduced exposure to SHS in high-risk settings by 80-90%. The residual exposures are likely caused by smoking around the boundaries of venues, including designated smoking areas on patios and verandas. As a result, indoor smoke-free workplace laws greatly reduce, but do not remove altogether, the potential for harm to health caused by SHS around bars, restaurants, and similar settings. Also, smoking in cars generates high levels of SHS.

The most comprehensive study to date indicates that legislation may reduce exposure to SHS population-wide by up to 40%. Several large, well-designed studies have found that comprehensive smoke-free policies

do not lead to increased exposure to SHS in the home. Another important feature of comprehensive legislation is its impact on inequalities; the largest absolute reductions in exposure to SHS in the workplace tend to occur among those groups that had the highest pre-legislation exposures.

Given the relatively recent introduction of comprehensive bans, there is only one study reporting on sustained changes in SHS exposure. More than 10 years of follow-up data from California show that the early reductions in SHS exposure have not been reversed.

There are short-term improvements in health linked to these restrictions on smoking. Workforce studies have reported reductions in acute respiratory illnesses after smoking bans, and early findings of substantial declines in hospital admissions for acute myocardial infarction have been replicated in numerous studies. The literature also indicates that wide-ranging bans on smoking in the workplace are followed by as much as a 10-20% reduction in hospital admissions for acute coronary events in the general population in the first year post-ban. At present, it is not possible to distinguish the contributions to the decline in hospital admissions of changes in smoking rates and prevalence, and those of reduced exposures to SHS. The precise magnitude of the reduction in admissions is uncertain, but will vary with the background incidence of heart disease, the prevalence of exposure to SHS preceding the ban, and the extent of the legislation and its implementation.

SHS increases the risk of lung cancer, but the time period between cessation of exposure and decrease in risk may be 10-20 years, making it difficult to link changes in disease rates with introduction of smoking restrictions. However, given the strength of the evidence linking SHS to increased risk of lung cancer, the reduction in exposure following smoke-free legislation is expected to ultimately be reflected in a decrease in the incidence of this particular disease.

### **Conclusions**

Implementation of smoke-free policies leads to a substantial decline in exposure to SHS, reduces social inequalities in SHS exposure at work, appears to cause a decline in heart disease morbidity (the published data on this are consistent, but longer-term follow-up is required), and decreases respiratory symptoms in workers. Lung cancer incidence in nonsmokers can be expected to decline 10-20 years after smoke-free legislation is put into action. Thus far, data are not available documenting such declines, as most smoke-free legislation has only recently been implemented.

### **Effect on smoking behaviour**

In areas where new smoke-free laws were part of multiple tobacco control efforts, there was clear and consistent evidence of a positive change in smoking behaviour from prior ongoing trends. However, if multiple tobacco control measures are instituted simultaneously, attribution of the change to a new law restricting

smoking is not possible.

Studies that assessed smoking behaviour, before and after implementation of new laws restricting smoking in public and workplaces, were analytically weak and produced mixed results; some provided no statistical evaluation even though differences or trends appeared to be present.

Nearly all the studies correlating the extent and strength of laws restricting smoking with various aspects of smoking behaviour found the expected associations: localities with relatively stronger restrictions in more places, or that covered a greater proportion of the population, generally showed lower adult and youth prevalence rates and reduced cigarette consumption. Whether localities with strong anti-smoking norms were more likely to pass such regulations, or the regulations led to reduced smoking, is unknown.

At an individual level, studies of workers subject to smoke-free policies in the workplace indicate that these restrictions reduce smokers' cigarette consumption by 2-4 cigarettes per day. Whether or not the reduction in daily cigarette consumption is sufficient to make the smokers less addicted, and therefore more likely to quit in the future, is unknown, but some evidence suggests that the reduction in consumption in the short-term may lead to increased cessation in the long-term.

Population studies, even the cross-sectional ones, that adjusted for worker characteristics, including demographics and occupation, are likely minimally biased. Nearly all these studies found that smoke-free

workplaces were more associated with decreased smoking among workers than settings that only implemented partial restrictions.

To date, there are limited data concerning the effect of a completely smoke-free campus for everyone (students and adults) on adolescent smoking behaviour. Not witnessing teachers smoking on campus may reinforce school-level anti-smoking norms and lead to reduced adolescent smoking initiation, but further research is required to explore this issue.

### **Conclusions**

Smoke-free workplaces reduce cigarette consumption among continuing smokers and lead to increased successful cessation among smokers. Smoke-free policies appear to reduce tobacco use among youth. There is a greater decline in smoking when smoke-free policies are part of a comprehensive tobacco control program.

### **Home smoking restrictions**

Where data are available, the prevalence of smokers who have implemented a smoke-free policy at home has shown a clear increase over time. Also, there is a shift from reports of households having partial restrictions to reports of completely smoke-free homes. This may be a good indicator of population acceptance of the harmfulness of SHS and tobacco control success.

Demographic characteristics consistently associated with reports by smokers of smoke-free homes include individuals of a younger age, male sex, and higher education level.

Also, related to reports of smoke-free homes are the presence of nonsmokers, particularly children, lower cigarette consumption (or addiction) level, and interest in quitting.

The proportion of children protected from SHS varies greatly by locality and is closely linked to parental smoking prevalence. Where data are available, generally in localities with tobacco control programs that include smoke-free policies, downward trends in child SHS exposure rates in the home are apparent.

In families with smokers, the presence of smoke-free policies reduces children's exposure to SHS. Less extensive restrictions were not as effective, and in some cases were ineffective. Previous interventions with smokers, in an attempt to decrease their children's exposure to SHS, have generally concentrated on getting parents to quit, and have produced disappointing results. Tobacco control efforts focused on the entire population may do more to reduce SHS exposure than efforts aimed directly at individual parents.

The studies of the positive effects of home smoking restrictions on smoking behaviour were consistently stronger than those for workplace policies. Longitudinal studies show reduced consumption and a more consistent effect on quitting. If a smoke-free home helps quitters remain abstinent longer, and several studies presented evidence that they do, such policies will have a positive impact on eventual increased successful cessation.

The preponderance of cross-sectional evidence to date suggests

that fewer adolescent children of non-smoking parents living in smoke-free homes initiate smoking compared to children from a home that is not smoke-free. A smoke-free home policy is a clear message from nonsmoking

parents to their children that smoking is unacceptable. Whether such a message from a parent who smokes can influence their children not to smoke requires further research.

### **Conclusions**

Smoke-free home policies reduce exposure of children to SHS, reduce adult smoking, and appear to reduce youth smoking.