

Chapter 5

Public attitudes towards smoke-free policies – including compliance with policies

Introduction

This Chapter reviews what is known about public attitudes towards both legal and voluntary restrictions on tobacco use to protect against secondhand smoke (SHS) exposure. Attitudinal data was considered in this Handbook, as it is an important moderator in the process of adoption and compliance with smoke-free policies (see the conceptual framework in IARC's Handbook volume 12 (IARC, 2008)). More specifically public attitudes are important for the following reasons:

- In democratic nations, supportive public attitudes are often necessary for facilitating the process of passing smoke-free legislation or regulations by local or national governments.
- Once such legislation or regulations exist, public attitudes are likely to impact how well such laws are complied with and enforced; hence, how well these laws achieve health protection goals of reducing SHS exposure (see Chapter 6). If such laws are successful, there may be other benefits in terms of reduced tobacco consumption, quitting

behaviour, and possibly reduced visible role-modelling of smoking in the presence of children (see Chapter 7).

- The attitudes of the public are likely to be important in terms of the extent to which voluntary control measures (e.g. smoke-free homes and, in most jurisdictions, also cars) are adopted and complied with by individuals and families. There is evidence for this social diffusion model for the adoption of smoke-free homes from a study of smokers in four countries (Borland *et al.*, 2006a).
- Public attitudes concerning SHS may conceivably impact the extent to which governments make progress on other aspects of tobacco control that benefit from public support (e.g. high tobacco taxes, funding of mass media campaigns, and restrictions on tobacco marketing). Similarly, public attitudes can help guide appropriate policy in areas which are controversial among tobacco control experts (e.g. smoking restrictions in some outdoor settings) (Chapman, 2007). Appropriate care with such

policy-making could minimise the risk of a public backlash with regard to tobacco control interventions in general.

Nevertheless, "attitudes" are a complex construct and can involve a number of dimensions. There are inadequate data on which to disentangle attitudes towards smoke-free policies that are attributable to concerns about involuntary exposure to SHS and health hazards, general concerns for protecting infants and children, protection against nuisance impacts, and respect for the law or voluntary policies (once a smoke-free policy is in place). There is also insufficient clarification in the literature about how smoke-free attitudes relate to emotional reactions to smoking and to the imposition of laws that are not supported by some smokers. Attitudes around smoking may also be linked in complex ways with satisfaction of particular experiences (e.g. socialising in restaurants and bars). There is some further consideration of the issue of knowledge and beliefs in the Discussion, but this Chapter has not been able to tease out the different

dimensions of what comprise attitudes to smoke-free policies.

In summary, the quality of these studies varies widely from high quality prospective cohort studies to telephone surveys in just a city jurisdiction.

This Chapter has involved systematic review of the peer-reviewed literature published since January 1990 (up to 31 December 2007) with additional specific Medline searches conducted up to 31 March 2008. The major focus was on identifying Medline-indexed articles. More specifically, the stages of the literature search were as follows:

- Identification of country level and any multi-country studies on public attitudes and compliance in developed countries. Particularly rigorous searches were focused on identifying attitudinal changes associated with countries that have introduced comprehensive smoke-free laws (see Chapter 3). The voluminous number of attitudinal studies on SHS at the sub-national level prevented a comprehensive view of these, though this is unlikely to substantively impact the patterns found (see the Discussion section of this Chapter). While focused on “public attitudes,” this Chapter also describes, where appropriate, some attitudinal data of specific occupational groups (e.g. school staff, hospital employees, and hospitality workers).
- Where major categories of public settings in developed countries were not covered by such country level studies, searches were then conducted for published sub-national level studies (such as at

the level of US/Australian states or Canadian provinces). Failing the identification of any such studies, the searches were further expanded to local studies (e.g. at the level of a city or organisational setting). The search engine Google Scholar was also used to identify such additional studies.

- The above approach was supplemented by a case study of one sub-national jurisdiction in the USA: California. This selection was based on the fact that California was the first major jurisdiction in the world to restrict smoking in the hospitality sector. This state is also a leader in smoke-free mass media campaigns and in outdoor SHS restrictions. As the third US state to adopt a smoke-free car law, it also has the second highest prevalence of smoke-free home rules in the USA (after Utah) (Centers for Disease Control and Prevention, 2007a), and has longitudinal data on public attitudes towards smoking restrictions that cover a long time period.

- For developing countries, searches included all published studies even if they were focused on a single state, city, or organisation. This was done due to the shortage of country level studies in such countries. This country grouping included all non-Organisation for Economic Cooperation and Development (OECD) countries, including Mexico, Poland, and Turkey.

The 1990 cut-off point for the start of the search period was somewhat arbitrary, but coincided with the

beginning of fairly comprehensive smoke-free laws at the country level (e.g. the 1990 smoke-free Environments Act in New Zealand). Substantive shifts in public attitudes towards SHS have been documented before this time in selected countries, probably in response to various key actions (see Chapter 3 for details). From 1969 on, for example, there was concern by flight attendants in the USA regarding SHS (Holm & Davis, 2004). The health-related evidence base concerning SHS continued to evolve from the first time it was discussed in a report of the US Surgeon General, though this was not a major focus of the report (U.S. Department of Health, Education, and Welfare, 1972).

Attitudes towards, and compliance with, smoking restrictions in workplaces

This subsection examines attitudes towards indoor workplace smoking restrictions, excluding hospitality venues and other special settings, which are detailed elsewhere in this Chapter. Smoking restrictions for indoor workplaces have become relatively common in developed countries (e.g. for the USA; Centers for Disease Control and Prevention, 2006a) and even some developing countries (e.g. in India and Indonesia in workplaces serving children, Mongolia, South Africa, and Uruguay (GTSS Collaborative Group, 2006); see Chapter 3 for details). Studies of attitudes are detailed in Table 5.1 and compliance data in Tables 5.2 and 5.3.

Table 5.1 Studies on public attitudes towards workplace smoking restrictions

Reference/Location	Study design and date	Results	Comments
Multi-country and country level studies			
Health Canada, 2006 Canada	Canadian Tobacco Use Monitoring Survey (CTUMS), (2006)	Majority support (86%) for some form of restriction on smoking in the workplace.	40% of respondents felt that smoking should not be allowed in any area of the workplace (indoor or outdoor); 46% felt that smoking should be allowed only in designated outdoor smoking areas.
U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS), (1991-93; 1998-99; 2001-02).	By 1992-93 majority public support (58.1%) for smoke-free indoor work-places in all geographic regions, age groups, both genders, education groups, income groups, and ethnic groups. Support has increased since this time.	Support rose from 58.1% in 1992-93 to 74.5% in 2001-02. In 1992-93 the only respondents who did not indicate majority favour (>50%) were smokers (30.6%) and blue collar workers (46.5%). By 2001-02 all groups had a majority in favour (>50%).
Fong <i>et al.</i> , 2006 Ireland, UK	Prospective cohorts (2003-04; 2004-05)	Among smokers: Overall, 67% of Irish smokers reported support for a total ban on smoking in work-places; for the UK, the support was just over 40% *.	The level of support among Irish smokers increased from 43%, prior to a smoke-free law (a statistically significant higher increase than for the UK). Overall, 83% of Irish smokers reported that the new smoke-free law (covering pubs and other places) was a “good” or “very good” thing (after its introduction).
Renaud, 2007 France	Opinion polls (2006, 2007)	Workplaces including restaurants & bars: Majority support (76% in 2006) for a law banning smoking in public areas and work-places; increased to 83% two months after the ban was enacted in 2007.	These polls related to a January 2007 law for public areas and workplaces. Relating to restaurants and cafés - law operational January 2008. The quality of these opinion polls was not documented in this report. No Medline-indexed national attitudinal studies for France were identified. However, other articles on France refer to “public opinion” supporting such a ban (Dubois, 2005).
European Commission, 2007 European countries**	Representative sampling, face-to-face interviews (2006)	High level of support (88%) for smoke-free workplaces.	Range of support for “totally in favour” - 46% for Austria to 93% for Sweden. The lowest for “totally in favour” plus “somewhat in favour” was 80% for Austria. Slight increase (+2 percentage points) compared to the 2005 survey. Increase was most marked among those “totally in favour” (+4 percentage points).
Edwards <i>et al.</i> , 2008 (with additional detail in Edwards <i>et al.</i> , 2007) New Zealand	Health Sponsorship Council (HSC) annual surveys (2003-2006)	Majority support for the right to work in a smoke-free environment (94.9% in 2006 - 92.3% in smokers).	Support increased from 90.7% in 2003 for all respondents; 82.6% for smokers (both significant). Support for non-office workers to work in a smoke-free environment was also high in 2006 at 94.7% and 89.8% (all respondents and smokers respectively). See Table 5.4 for data relating to bars and restaurants. Other national data for NZ also indicate negative attitudes towards SHS exposure (Ministry of Health, 2007).

Table 5.1 Studies on public attitudes towards workplace smoking restrictions

Reference/Location	Study design and date	Results	Comments
Studies in developing countries (Including sub-national and city studies)			
Bello <i>et al.</i> , 2004 Chile	Adults employed in the Chilean Ministry of Health (2001)	A majority (89%) agreed with smoking restrictions in work places.	Based only on the English translation of Medline abstract. This study may not be representative of the general population.
Barnoya <i>et al.</i> , 2007 Guatemala	Survey of workers in a convenience sample of settings in Guatemala City (2006)	A majority of groups of workers were in favour of smoke-free workplaces (but not in two of the five groups).	Majority support for smoke-free work-places among hospital workers (75%), school/university workers (67%), and government building workers (50%). Minority support among airport (39%) and bar/restaurant workers (30%).
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide representative sample of adults (2007)	Majority level support for a complete ban in worksites (69%).	This level was a bit lower than for public places in general at 76% support (Smoking was restricted in worksites in 1995).

*These percentages are imprecise because they are based on graphically presented results and not on exact tabulated data (which were not in the published article)

** Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom. Other jurisdictions: Bulgaria, Croatia, Romania

Discussion of the results

The findings from country level studies are suggestive of the following patterns:

- There are majority levels of public support for smoke-free workplaces in the developed countries for which data are available (including, since at least 1992-93, the USA). There is also majority public support in those developing countries that have attitudinal data, including those less developed European countries in the 29 country study detailed in Table 5.1.
- Smokers appear to be less supportive of restrictions than nonsmokers (particularly of complete restrictions), but in some studies a majority of them support workplace restrictions.

- There is a general pattern of increasing support by smokers and nonsmokers in the past two decades for such workplace restrictions. Support also increases after new laws designed to tighten restrictions on SHS exposure are enacted. This effect may relate to the law, or, in some cases, to mass media campaigns that precede, coincide with, and/or follow such new legislation.
- There is an overall pattern of higher support for smoke-free indoor workplace laws in general than for specific smoke-free workplaces in hospitality settings (e.g. for bars and restaurants, as detailed further in the next subsection).

The findings at the national level (Table 5.2) obscure some of substantive changes at the sub-national level. For example, California implemented a policy mandating smoke-free indoor workplaces in 1995 (with the law extending to all bars and clubs in 1998). Following the implementation of the smoke-free workplace policy, data from the California Tobacco Surveys (CTS) showed that the percentage of indoor workers reporting that their workplace was smoke-free increased markedly, from 46.3% in 1992 to 90.5% in 1996 (Gilpin *et al.*, 2002). The 1999 CTS data indicated a further increase in smoke-free workplaces (93.4%) after other venues became smoke-free.

Table 5.2 Country level and multi-country studies on compliance with indoor workplace smoking restrictions

Reference/Location	Study design and date	Results	Comments
Nebot <i>et al.</i> , 2005 7 European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	In university settings: Some limited evidence for compliance, but nicotine was still found in most of the sites studied.	Nicotine levels were lower in the sites with smoking restrictions; also lower than other public places (e.g. transportation settings). Sweden had relatively low levels compared to Austria, France, Greece, Italy, Portugal, and Spain.
Health Canada, 2006 Canada	Canadian Tobacco Use Monitoring Survey (CTUMS) (2006)	Some possible evidence for incomplete compliance with restrictions.	23% reported SHS exposure at the workplace in the last month. Yet, 94% of those who worked at a job or business in the last 12 months reported that some kind of workplace smoking restriction was in place.
Pickett <i>et al.</i> , 2006 USA	National Health and Nutrition Examination Survey (1999-2002)	Good scientific evidence from a biomarker (cotinine) study that smoke-free law coverage reduces exposure to SHS (indicating high compliance with such laws).	Blood cotinine levels were measured. Among nonsmoking adults living in counties with extensive smoke-free law coverage, 12.5% were exposed to SHS, compared with 35.1% with limited coverage, and 45.9% with no law. "These results support the scientific evidence suggesting that smoke-free laws are an effective strategy for reducing SHS exposure."
Fong <i>et al.</i> , 2006 Ireland, UK	Prospective cohorts (2003-04; 2004-05)	Among smokers: Irish smokers reported that smoking had become uncommon in workplace settings after a smoke-free law.	The proportion of Irish smokers who observed smoking in these settings declined from 62% (pre-law) to 14% post-law. In the UK, levels were 37% and 34%, respectively, in this time period. See Chapter 6 for further details.
European Commission, 2007 29 European countries (25 in the EU)	Representative sampling, face-to-face interviews (2006)	Majority not exposed to SHS at work in all but one EU member state - suggestive of some compliance with laws that exist.	In all EU member states but one, the majority of respondents declared that they are never, or almost never, exposed to SHS at work in indoor workplaces or offices. The most likely to declare this were the Irish (96%); least likely were the Greeks (15%). Those claiming to be exposed to SHS for more than five hours a day ranged from 34% in Greece to 0% in Ireland. Despite the comprehensive restrictions in Italy, Malta, and Sweden, 30%, 19% and 6% respectively claimed to be exposed to SHS (for at least <1 hour per day).
Lund & Lindbak, 2007 Norway	Regular national surveys (most recently 2006)	Very low workplace exposure suggestive of good compliance.	In 1996, 9% of occupationally active adults reported workplace SHS exposure; this dropped to 2% in 2006. The new smoke-free hospitality law in 2004 may have been a factor in increased workplace restrictions, and provision of smoking cessation services at work.
Ministry of Health, 2007 New Zealand	National face-to-face survey (2006)	High compliance based on reported exposure to smoking (89.4% report no one smoking indoors at work).	There was no gradient by ethnicity (Maori versus non-Maori), deprivation level, or major occupational groupings. Also reported were attitudinal data indicating most respondents would be bothered by someone smoking near to them indoors (70.8%).

Table 5.2 Country level and multi-country studies on compliance with indoor workplace smoking restrictions

Reference/Location	Study design and date	Results	Comments
Edwards <i>et al.</i> , 2008 New Zealand	Health Sponsorship Council (HSC) annual surveys (2003-2006)	High compliance (only 8% of employed adults reported SHS exposure at work in the past week in 2006).	This figure fell from around 20% in 2003 (a new smoke-free law that tightened restrictions was introduced in 2004). There were greater reductions among Maori workers.

Table 5.3 Studies in developing countries on compliance with indoor workplace smoking restrictions (including country level, sub-national and city level studies)

Reference/location	Study design and date	Results	Comments
Yang <i>et al.</i> , 1999 China	Representative sample covering 30 Provinces (1996)	Workplaces: A quarter of respondents reported SHS exposure in their workplaces (25%) suggesting that restrictions in such areas are not fully complied with.	This was lower than for exposure at home (71%) and public places (32%).
McGhee <i>et al.</i> , 2002 Hong Kong, China	Telephone survey (circa 2001)	Some evidence for lack of workplace smoking restrictions (or compliance for any that exist).	Nonsmoking workers - 47.5% exposed to SHS in the workplace (compared with 26% exposed at home). Range (by occupational category): Men - 43.9% among financing/business workers to 80.1% for construction workers. Women - 24.0% for community/social services workers to 62.0% for transport/communication workers. Extent of restrictions was not documented.
Navas-Acien <i>et al.</i> , 2004 7 Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	Government buildings: Some limited evidence for some compliance with smoking restrictions.	Smoking was usually restricted in these buildings. Median level of nicotine was lower than for hospitality settings in these countries, and was comparable to levels from studies of open US offices where smoking was restricted. The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay.
Barnoya <i>et al.</i> , 2007 Guatemala, Honduras, Mexico, Panama	Measurement of airborne nicotine in multiple settings in the capital cities (2006)	Government buildings: Some evidence for compliance with smoking restrictions.	Nicotine levels were much lower than hospitality venues, but higher than schools and hospitals (the latter two comparisons were not statistically significant). Mexican component of this study noted nicotine levels in these offices "reflect the lack of compliance with mandatory nonsmoking official regulations in Mexico" (Barrientos-Gutierrez <i>et al.</i> , 2007b).
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban and rural settings (2005)	Government buildings: No clear evidence for compliance with restrictions.	Airborne nicotine was detected in 97.7% of the locations. Median level was higher than hospitals and schools, but lower than transportation settings, restaurants, and entertainment settings.
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide surveys based on random representative sample of adults (1995 and 2007)	Substantial decline in reported SHS exposure of adults at worksite after smoking restrictions in place.	Since 1995, when smoking in workplaces was restricted, the percentage of adult nonsmokers exposed to SHS in worksites declined in women from 37% to 14% and in men from 47% to 24%.

Compliance

The available country level data indicate fairly high compliance with smoke-free workplace laws in the countries with such data. The data presented in Chapter 6 also show that introducing smoke-free laws results in lower exposure to SHS, which suggests compliance with the law. There are, however, examples where such smoke-free laws have not been complied with. In 1991, for example, a law in France was considered to be unsuccessful: “Failure to properly implement Evin’s law of 1991 explains why nonsmokers in France are still not protected” (Dubois, 2005). This lack of success resulted in a new law being introduced, which covered workplaces from 2007, and bars/restaurants from 2008.

The evidence in developing countries is also generally indicative of some compliance in workplaces; though results are more mixed than for developed countries. This is also the case in those less developed European countries in the 29 country study detailed in Table 5.3.

At the sub-national level compliance may be reported as problematic. For example, in California in 1999, there was an increase in the percentage (to 15.6%) of nonsmoking indoor workers reporting someone had smoked in their work area in the past two weeks (Gilpin *et al.*, 2002). This increase could have been due to poorer compliance with the law in venues that were covered by an expansion of it in the preceding year (i.e. to cover bars and clubs).

More recent reports for California still indicate incomplete compliance, with reports of smoke-

free workplaces at 95.5% in 2002 and 94.8% in 2005, and with corresponding rates of reporting by respondents of exposure to someone smoking in their work area as 12.0% and 13.9%, respectively (Gilpin *et al.*, 2003; Al-Delaimy *et al.*, 2008). However, another factor may be that nonsmokers have become further aware of SHS over time, which may cause them to report this more than they would have previously.

Compliance with smoke-free laws may also be poorer in particular occupational settings. In California, daily exposure to SHS was about twice as common in factories, stores/warehouses, and restaurants/bars (10-13%), than in offices, hospitals, or classrooms (2-7%) (Gilpin *et al.*, 2003). This pattern may also reflect differing smoking prevalences among workers in these types of workplaces. For example, data from the 2005 CTS indicate that the people smoking were other employees (87%), customers or non-employees (63%), or supervisors (31%) (Al-Delaimy *et al.*, 2008).

Relevance for evidence-based tobacco control

Smoking restrictions in workplaces are likely to see a relatively high level of public support compared to most other settings. In general, workplaces have been one of the top priorities for smoke-free laws for any level of government that has relevant power to regulate them. However, policymakers and health workers should consider obtaining representative attitudinal data in their jurisdiction prior to implementing new laws. This will inform the need for the use of mass media campaigns

that deal with the SHS hazard and highlight the rights of workers to be protected from a serious threat to their health. Attitudinal data may also justify the need for the resourcing of enforcement activities.

Taking a comprehensive approach to smoking restrictions in all workplaces (including in the hospitality sector) has advantages in terms of policy coherence and alerting the public of the seriousness of SHS as a workplace hazard. Another subsection of this Chapter gives further consideration to such workplaces as health care facilities, schools, and transportation settings.

Summary

There are generally majority levels of public support for smoke-free indoor workplaces in these developed countries for which country level data are available. Compliance with such smoking restrictions is usually fairly substantial and likely to be delivering significant public health benefits at a population level. However, in developing countries compliance generally appears to be poor in some settings.

Attitudes towards, and compliance with, smoking restrictions in hospitality settings (i.e. restaurants, bars, and pubs)

This subsection covers public attitudes towards, and compliance with, smoking restrictions in hospitality settings such as restaurants, bars and pubs, which have seen marked increases in smoking restrictions in the last few years (see Chapter 3).

Attitudinal studies are detailed in Table 5.4 and studies on compliance in Tables 5.5 and 5.6.

Discussion of the results – attitudes

The findings from the country level studies in Table 5.4 are suggestive of the following patterns:

- There are majority levels of public support for smoke-free restaurants in the developed countries studied. There is also generally majority support by smokers for at least partial smoking restrictions in restaurants, but not usually for fully smoke-free restaurants (though in some places, such as Australia, there was majority support (71%) among smokers; see Table 5.4).
- The support for totally smoke-free bars is generally lower than for smoke-free restaurants, and some countries do not have majority public support. However, in some settings (i.e. localities where extensive restrictions are already in place) smokers themselves may indicate majority support for these restrictions (e.g. in Australia, Canada, and the USA).
- A pattern of increasing support by smokers and nonsmokers in the past two decades for smoke-free hospitality settings is apparent. Other reviews have also identified these trends, for example, in Australia (Siahpush & Scollo, 2001; Walsh & Tzelepis, 2003).
- Though the attitudinal data from developing countries are more limited, there is still majority support for totally smoke-free policies in most of the studies identified (e.g. 68.9% for restaurants in Hong Kong). Also,

there was a pattern of majority public support in those less developed European countries in the 29 country study detailed in Table 5.4 (all countries had majority support for smoke-free restaurants and most had majority support for bars).

Detailed elsewhere in the literature are other reported patterns of note. These include evidence that levels of support for smoke-free hospitality settings increase before smoke-free laws are passed (Schofield & Edwards, 1995; Walsh *et al.*, 2000), perhaps as a result of the publicity surrounding the advocacy for such laws, and also after these laws come into force (Wakefield *et al.*, 1996; Tang *et al.*, 2003; Edwards *et al.*, 2008).

Discussion of the results – compliance

There are country level and multi-country studies that have collected observational data (from researchers and smokers), fine particulate data, and airborne nicotine data (Table 5.5). Collectively these results show fairly high levels of compliance with smoking restrictions in all the hospitality settings with smoking restrictions. They also show that in the comparison countries, without such restrictions, the indoor air pollution from SHS is at hazardous levels. The data presented in Chapter 6 also show that introducing smoke-free laws into hospitality settings results in lower exposure to SHS, which suggests compliance with the law.

Of particular note is the apparent high compliance with smoke-free pubs in Ireland given the strong

traditional pub culture in this society. Similarly, Norway achieved very high compliance despite the cold and wet climate making outdoor smoking much more difficult. However, one multi-country study in Europe reported that nonsmoking areas within restaurants had similar air nicotine levels to smoking areas in cities in France, Italy, and Austria (Nebot *et al.*, 2005).

In comparison, the studies in developing countries indicate poorer compliance and even an apparent absence of any compliance in some settings (Table 5.6). Despite this, in some settings no smoking was observed in the smoking-restricted parts of restaurants, and there was sometimes evidence of modest benefits in terms of air quality from partial smoking restrictions (e.g. the studies in Hong Kong, Beijing, and seven Latin American countries).

It is important to note that by focusing on country level studies this Chapter has not examined a wealth of literature at the sub-national level. For example, one review of the Australian literature identified 31 sub-national attitudinal studies on hospitality settings and smoking restrictions, in addition to the three national ones mentioned in Table 5.4 (Walsh & Tzelepis, 2003). Similarly, in the area of compliance and attitudes towards smoke-free laws in hospitality settings, there is a substantial body of literature at the state level in the USA (e.g. California), with studies covering direct observation in bars and interviews with staff (Weber *et al.*, 2003; Tang *et al.*, 2004; Moore *et al.*, 2006), and population telephone surveys that identified and interviewed bar patrons (Tang *et al.*, 2003; Friis & Safer, 2005).

Table 5.4 Studies on public attitudes towards smoking restrictions in hospitality venues (restaurants, bars, pubs, etc.)

Reference/location	Study design and date	Results	Comments
Country level and multi-country studies			
Walsh & Tzelepis, 2003 Australia	Three national studies (1993, 1998, 2001)	All licensed premises: Majority support in most recent national survey (60.8%). This was the case for all but one of the eight states/territories in 2001.	1993 - 41% support for smoking bans in pubs/clubs (versus 35% opposed). 1998 - 49.9% support for smoking bans in pubs/clubs. 2001 - majority support at 60.8% (range by state: 48.5% to 63.4%). This analysis (which studied 34 community surveys) reported that from 2000 all state level surveys with the ban option alone had majority support for bars (52-68%) and gambling areas (64-76%). A survey in Victoria in 2002 also reported 88% support for having a smoke-free room.
Lund, 2006; Lund & Lund, 2006; Lund & Lindbak, 2007 Norway	National annual surveys (2003 -2006)	Hospitality venues: Majority support (76%) which increased after a new smoke-free law became operational in 2004.	In 2005, support was 84% among nonsmokers and 45% among daily smokers (up from 25% in 2003). After the ban, a minority of daily smokers reported a reduction in satisfaction when visiting smoke-free pubs and restaurants (38% and 32%, respectively). Among nonsmokers, higher satisfaction was reported at 81% and 82%, respectively. Majority support amongst young people aged 16-20 years (73%) and employees (60% - up from 48% before the law).
- Just restaurants			
U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS) (1991-93; 1998-99; 2001-02)	By 2001-02 there was widespread public support (>50%) for smoke-free restaurants in all geographic regions, age groups, both genders, education groups, income groups, main occupational groups, and ethnic groups.	Support rose from 45.1% in 1992-93 to 57.6% in 2001-02. In 2001-02 the only respondents who did not indicate majority favour (>50%) were those living in the Midwest (49.9%) and smokers (26.6%). In the 1992-93 survey only some population groups favoured smoke-free restaurants overall (those in the West, nonsmokers, those with higher education, and those who were Hispanic or non-Hispanic Asian).
Borland <i>et al.</i> , 2006b Australia, Canada, UK, USA	Prospective cohorts (2002)	Among smokers: A large majority of smokers accepted at least some restrictions in restaurants (all >94%). But only in Australia (out of four countries) did most support total bans in indoor areas (71.4%).	Support for total bans: Australia (71.4%), the UK (24.2%), Canada (29.7%), and the USA (26.7%). Associates of support for bans (on logistic regression) were: reported presence of a total ban, documented extensive restrictions, thinking about the harms of passive smoking more frequently, and the belief that SHS can cause lung cancer in nonsmokers. Female smokers, and those with heavier cigarette consumption, were less supportive of bans.
Fong <i>et al.</i> , 2006 Ireland, UK	Prospective cohorts (2003-04; 2004-05)	Among smokers (restaurants/fast food outlets): Most Irish smokers (77%) supported a total ban on smoking, in restaurants; the UK smokers support was lower (just over 40%*).	The level of support for Irish smokers increased from 45% prior to a smoke-free law (a statistically significant higher increase than for the UK). The support for a total ban in fast food outlets was around 90% among Irish smokers and over 75% for UK smokers.*

Table 5.4 Studies on public attitudes towards smoking restrictions in hospitality venues (restaurants, bars, pubs, etc.)

Reference/location	Study design and date	Results	Comments
- Just restaurants			
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Majority support (77%) for banning smoking in restaurants. A majority of smokers (59%) also support this.	77% supported restrictions; 55% completely in favour. Majority support in all countries: Malta (95%), Ireland (95%), Sweden (93%), and Italy (90%). Proportion completely supportive of restrictions was highest in Ireland (88%) and lowest in Austria (31%). Least support was in Czech Republic (59%), though support had increased from the 2005 survey by +10 points. Most in favour of smoke-free restaurants were nonsmokers (87%) compared to smokers (59%). Those who work in restaurants were also generally in favour (64%). Of note was that the respondents with the least level of education were more "totally in favour" of restrictions than those with higher educational levels.
Health Canada, 2006 Canada	Canadian Tobacco Use Monitoring Survey (CTUMS) (2006)	Majority support for no smoking in any section of a restaurant (69%).	An increase from 2001 (also a CTUMS survey), where only 42% believed that smoking should not be allowed in any section of a restaurant. Even in 2001 most (57%) of current smokers wanted some kind of restriction (25% wanted no smoking at all and 32% wanted smoking only in an enclosed area).
Edwards <i>et al.</i> , 2008 New Zealand		Majority support for smoking bans in restaurants (80% in 2006). Majority support for the right of restaurant workers to work in a smoke-free environment (95.6% in 2006; 93.4% in smokers).	Support for a ban increased from 61% in 2001 to 80% by 2006 (UMR data). HSC data reported it at 90% in 2006 (up from 73% in 2004). Among smokers it was 78% (up from 48% in 2004). The level of support increased for the rights of restaurant workers from 84.4% in 2003 for all respondents and from 67.8% for smokers (both significant). Support increased after a law banning smoking in bars in 2004.
- Just bars / pubs			
U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS) (1991-93; 1998-99; 2001-02)	By 2001-02 there was still limited public support (<50%) for smoke-free bars in all geographic regions, age groups, smokers and nonsmokers, both genders, education groups, income groups, main occupational groups, and ethnic groups.	Support rose from 24.2% in 1992-93 to 34.0% in 2001-02. In 2001-02 the only respondents who indicated favour in the 40%+ category were: those living in the West, where smoke-free bars were more common (43.3%); those aged 65+ (44.8%); nonsmokers (40.2%); Hispanics (46.1%); and non-Hispanic Asians (45.2%).
U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS) (1991-93; 1998-99; 2001-02)	Parts of bars: In all surveys there was only minority support for smoking being allowed in "some areas of bars."	Attitude over time: 44.2% in 1992-93 to 40.6% in 2001-02.
Borland <i>et al.</i> , 2006b Australia, Canada, UK, USA	Prospective cohorts (2002)	Among smokers: Majority support for total bans where extensive bans were in place (all >51%), but only minority support where there were no or limited bans in place (range: 20.9% to 54.2%).	Where there were extensive bans the support was: Australia (71.6%), UK (not applicable), Canada (51.1%), and USA (63.0%). Logistic regression analysis showed that the same variables related to support for bans in restaurants also applied to bars (see above in this Table). In addition, "both reported and documented restrictions in restaurants were also significantly related to support for bans in bars."

Table 5.4 Studies on public attitudes towards smoking restrictions in hospitality venues (restaurants, bars, pubs, etc.)

Reference/location	Study design and date	Results	Comments
- Just bars / pubs			
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003-04; 2004-05)	Among smokers: A minority (46%) of Irish smokers supported a total ban on smoking in bars/pubs; for the UK smokers support was lower (at just over 10%*).	Level of support for Irish smokers (which reached 46%) was substantially up from 13% prior to a smoke-free law (a statistically significant higher increase than for the UK). A more direct question about support for the total ban in pubs produced a higher result (64% of Irish smokers versus 25% of UK smokers).
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Majority support (62%) for banning smoking in bars/pubs (only a minority of smokers (38%) supported this).	As in a 2005 survey, the attitudes are divided across the European countries. Level of support exceeds 80% in Ireland (92%), Italy (89%), Sweden (88%) and Malta (81%). Only a minority are supportive in Austria (45%), the Czech Republic (42%), Denmark (46%), and in the Netherlands (46%). The majority of nonsmokers (77% totally) support a smoking ban when compared to a minority of smokers (38%).
Health Canada, 2006 Canada	Canadian Tobacco Use Monitoring Survey (CTUMS) (2006)	Around half (49%) felt that smoking should not be permitted in a bar or tavern.	This represented an increase from 26% in 2001 (also the CTUMS survey).
Edwards <i>et al.</i> , 2008 New Zealand	Health Sponsorship Council (HSC) annual surveys (2003-2006) & UMR Research Ltd surveys	Majority support for smoking bans in bars (74% in 2006). Majority support for the right of bar and pub workers to work in a smoke-free environment (91.5% in 2006; 82.7% in smokers).	Support for a ban increased from 38% in 2001 to 74% by 2006 (UMR data). HSC data reported it at 82% in 2006 (up from 61% in 2004). Among smokers it was 58% (up from 25% in 2004). The level of support increased for the rights of bar workers went from 79.1% in 2003 for all respondents and from 56.9% for smokers (HSC data). Support in all these areas increased after a law banning smoking in bars (in 2004).
Studies in developing countries - including sub-national and city studies			
Lam <i>et al.</i> , 2002 Hong Kong, China	A population-based, random digit dialing telephone survey of adults (1999, 2000)	Restaurants: Majority support (68.9%) for a totally smoke-free policy in restaurants.	Multivariate analyses concluded nonsmokers (among other groups) were more likely to support a totally smoke-free policy in restaurants. This comprehensive survey - the first in Asia - shows strong community support for smoke-free dining.
Barnoya <i>et al.</i> , 2007 Guatemala	Survey of workers in Guatemala City (2006)	Bar/restaurants (workers): Only a minority of bar and restaurant workers (30%) supported smoke-free workplaces	Results were lower than for the four other groups of workers studied. Study involved a convenience sample in the capital city - may not be representative.
Non-English language data sources reviewed in Sebrie <i>et al.</i> , 2008 Argentina and Brazil	Probabilistic telephone surveys in Argentina and convenience sampling in Brazil (both 2006)	Various hospitality settings: Majority support in all the various settings.	Argentina - 76.5% support for smoke-free restaurants and bars Brazil - 83% support for smoke-free restaurants, 79% for luncheonettes, 67% for bingo venues, 63% for bars, and 62% for night clubs.
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide representative sample of adults (2007)	Various hospitality settings: Majority level support for bans in four types of venues (range: 54% to 66%).	Support for bans: restaurants (66%), coffee bars (60%), pubs (55%) and disco and dancing clubs (54%). There were bigger differences between smokers and nonsmokers and between different social strata for support of a ban in the hospitality sector than for bans in other public places and worksites in Poland.

*These percentages are imprecise because they are based on graphically presented results and not on exact tabulated data (which were not in the published article)

Table 5.5 Country level and multi-country studies on compliance with smoking restrictions in hospitality venues

Reference/location	Study design and date	Results	Comments
Connolly <i>et al.</i> , 2006 13 countries / jurisdictions	Air quality study in Irish pubs, convenience samples (2004-2006)	Irish pubs: Air pollution was much lower in the pubs in smoke-free cities. In other smoking-permitted settings there was always evidence of serious pollution from SHS.	PM _{2.5} levels in Irish pubs in smoke-free cities were 93% lower than in pubs in smoking-permitted cities. This study mainly covered pubs in Ireland, the USA, and Canada, but also in Armenia, Australia, Belgium, China, England, France, Germany, Greece, Lebanon, Northern Ireland, Poland, and Romania. See Chapter 6 for further details.
Lund, 2006; Lund & Lund, 2006 Norway	National annual surveys (2003-2006)	Hospitality venues: Improved self-reported air quality by customers after a new smoke-free law in 2004, suggestive of compliance. Customer and hospitality staff reports also indicate high compliance.	Reports by nonsmokers of "very good air quality" increased after the law (from 9% to 58% for pubs and 36% to 70% for restaurants). Hospitality industry employees also reported improved air quality with a decline in problems due to SHS from 44% to 6% at five months post-law. Customers with high patronage rarely observed serious enforcement problems (3% for pubs and 2% for restaurants in the first 18 months). No indication of a change in patronage levels, so no evidence for smoking being displaced into home settings. A 1998 survey in one city also indicated compliance with an earlier law in hospitality settings (Emaus <i>et al.</i> , 2001).
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Restaurants and bars: High exposure probably reflects the low prevalence of smoking restrictions and the low use of voluntary restrictions in these settings in 2006.	The largest segment of European citizens who say they are exposed to SHS on a daily basis (70%), work in restaurants, pubs, and bars.
Hyland <i>et al.</i> , 2008a 32 country study (18 developing countries, including former Soviet Union countries)*	International cross-sectional air quality study (2005-2006)	Various settings: Air pollution from SHS was substantially lower in all settings where smoking was not permitted compared to where it was (for 30 relevant countries). Levels were much lower in the two countries with national smoke-free laws.	Fine particulate (PM _{2.5}) levels were 9.9 times greater in establishments where smoking was permitted than in places where it was not (most settings were either bars or restaurants). New Zealand and Ireland had the lowest levels of indoor air pollution (consistent with their national smoke-free policies). Average levels were far greater than what the US Environmental Protection Agency (EPA) and the WHO have concluded is harmful to human health. See Chapter 6 for further details.
Travers <i>et al.</i> , 2007 USA	Air quality study in 20 states and Puerto Rico (2003-2006)	Various settings: Observed compliance was high; air quality data supported this.	Observed compliance with new smoke-free laws: 96%. Venues that had gone smoke-free had a 91% reduction in PM _{2.5} levels (before/after study); they included bars, restaurants, pool halls, bingo halls, bowling centres, dance clubs, and casinos. (This large study (790 venues in many jurisdictions), was not designed to be fully nationally representative). See Chapter 6 for further details.
Lopez <i>et al.</i> , 2008 10 European cities of eight countries	Air nicotine sampling in 167 hospitality venues	Hospitality venues: Evidence for compliance with smoking restrictions in public places.	Lower air nicotine concentrations in countries with strong smoke-free policy (i.e. Ireland) and venues where smoking is not allowed or restricted.

Table 5.5 Country level and multi-country studies on compliance with smoking restrictions in hospitality venues

Reference/location	Study design and date	Results	Comments
Country level studies - smokers only			
Borland <i>et al.</i> , 2006b Australia, Canada, UK, USA	Prospective cohorts (2002)	Restaurants: Most smokers complied with total bans in restaurants (when last visited).	The incidence of smoking in restaurants by respondents (on the last visit and where there was a total ban on smoking): 2.5% (Australia); 20.4% (UK); 5.5% (Canada), and 4.2% (USA). Logistic regression analysis revealed that reported compliance was higher where there were also documented bans and among those supportive of total bans. It varied significantly by country (higher in the UK).
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003-04; 2004-05)	Restaurants: Irish smokers reported that smoking had become rare in these venues after a smoke-free law.	The proportion of Irish smokers who observed smoking in these venues declined from 85% (pre-law) to 3% post-law. In the UK, levels were 78% and 62%, respectively, in this time period. See Chapter 6 for further details.
Borland <i>et al.</i> , 2006b Australia, Canada, UK, USA	Prospective cohorts (2002)	Bars: Majority compliance by smokers in two out of the four countries (for total bans in bars and when last visited).	The incidence of smoking in bars by respondents (on the last visit and where there was a total ban on smoking) was: 52.1% (Australia); 85.1% (UK); 31.2% (Canada), and 27.1% (USA). In the USA, reported compliance was higher (82.5%) where there were also documented bans (mainly California).
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003-04; 2004-05)	Bars/pubs: Irish smokers reported that smoking had become rare in these venues after a smoke-free law.	The proportion of Irish smokers who observed smoking in these venues declined from 98% (pre-law) to 5% (post-law). In the UK, the level remained at 97%+ in this time period. Also, at post-law, 98% of Irish smokers said that there was less smoke in pubs than one year before (pre-ban), and 94% reported that pubs were enforcing the law "totally" ("somewhat" was 5%; "not at all" was 2%). See Chapter 6 for further details.
Country level studies - nonsmokers and smokers			
Ministry of Health, 2007 New Zealand	National face-to-face survey (2006)	Pub, club, or restaurants: High compliance with majority of respondents reporting no exposure to smoking indoors (only 7.4% report such exposure).	Where smoking was identified it was most common in: pubs (pubs=39.2%; restaurants=39.0%; clubs=14.4%; night clubs=14.1%; other public venue=6.8%).
Edwards <i>et al.</i> , 2008 New Zealand	Review of multiple and geographically distributed studies (2003-2006)	Bars and restaurants: High compliance suggested by the collective findings of five relevant studies.	Three observational studies detailed (one including restaurant data) and reports from participants in a bar managers cohort study. All indicated high compliance, as did cotinine and air quality studies (with some restaurant data). When considered collectively, these studies were not necessarily nationally representative.

Table 5.5 Country level and multi-country studies on compliance with smoking restrictions in hospitality venues

Reference/location	Study design and date	Results	Comments
Multi-country air quality studies			
Nebot <i>et al.</i> , 2005 Seven European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	Restaurants: Some limited evidence for compliance; nicotine still found in most of the sites studied.	Nicotine levels lower in sites with smoking restrictions. Nonsmoking areas within restaurants had similar levels to smoking areas in Vienna, Paris, and Florence. The countries were Austria, France, Greece, Italy, Portugal, Spain, and Sweden.
Nebot <i>et al.</i> , 2005 Seven European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	Discos or bars: No evidence for lower levels of SHS (no sites had restrictions).	These settings had the highest levels in the study of multiple public places. The countries were Austria, France, Greece, Italy, Portugal, Spain, and Sweden.

* Jurisdictions in this study included: Argentina, Armenia, Belgium, Brazil, Canada, China, Faroe Islands, France, Germany, Ghana, Greece, Ireland, Laos, Lebanon, Malaysia, Mexico, New Caledonia, New Zealand, Pakistan, Poland, Portugal, Romania, Singapore, Spain, Syria, Thailand, Tunisia, United Kingdom, USA, Uruguay, Venezuela, Viet Nam

Table 5.6 Studies in developing countries on compliance with smoking restrictions in hospitality venues (including country level, sub-national and city level studies)

Reference/location	Study design and date	Results	Comments
Navas-Acien <i>et al.</i> , 2004 Seven Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	Restaurants: General evidence for some level of compliance based on lower nicotine levels in the non-smoking areas in restaurants.	The median level of nicotine in nonsmoking areas was around half that in smoking areas of restaurants (but some levels were even higher than in adjacent smoking areas). The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay.
Navas-Acien <i>et al.</i> , 2004 Seven Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	Bars: No clear evidence for any compliance at this time.	Median level of nicotine was generally higher in bars than restaurants, but this was at a time when there were minimal restrictions in these countries for smoking in bars (since then there have been new laws that relate to bars in Uruguay and Buenos Aires, Argentina) (Barnoya <i>et al.</i> , 2007). The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay. More recent survey reports are suggestive that nearly 90% of respondents in Uruguay considered that enforcement with the recent comprehensive smoke-free law was "high or very high" (reviewed in Sebrie <i>et al.</i> , 2008).
Lung <i>et al.</i> , 2004 Taiwan, China	Observational and air quality study of coffee shops (2001)	Coffee shops: Some evidence for compliance (i.e. no smoking observed in the nonsmoking sections).	High levels of PM _{2.5} detected in the nonsmoking areas of these shops. Divisions between smoking and nonsmoking sections were not effective in preventing SHS exposure. See Chapter 6 for further details.
Fidan <i>et al.</i> , 2005 Turkey	Surveys of workers and hair nicotine sampling in the City of Izmir (2000-2001)	Coffee houses: No evidence that any smoking restrictions are operational in this setting (high hair nicotine levels found in workers).	Levels of hair nicotine in nonsmoking coffee house workers were 5.2 times higher than nonsmoking hospital worker controls, but the sample sizes in this study were small.

Table 5.6 Studies in developing countries on compliance with smoking restrictions in hospitality venues (including country level, sub-national and city level studies)

Reference/location	Study design and date	Results	Comments
Hedley <i>et al.</i> , 2006 Hong Kong, China	Cotinine measurements among workers (2000-2001)	Restaurants and bars: Some evidence for compliance with full smoking restrictions.	Among nonsmoking catering workers working in smoke-free areas there were higher levels of urinary cotinine than a control group (of university workers). This was explained by SHS exposure during break times. Levels of cotinine were much higher among workers in those workplaces with unrestricted smoking.
Barnoya <i>et al.</i> , 2007 Guatemala, Honduras, Mexico, Panama	Measurement of airborne nicotine in multiple settings in the capital cities (2006)	Restaurants/bars: No evidence for compliance with smoking restrictions.	Nicotine levels in each of these settings were high (relative to hospitals, schools, government buildings, and airports). In Guatemala, there was no clear evidence that the law covering restaurants was substantially reducing levels in bars (where there is no smoke-free law).
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban and rural settings (2005)	Restaurants: No clear evidence of restrictions or compliance with restrictions.	Airborne nicotine was detected in 100.0% of the locations. The median level was higher than four other types of settings, but was three times lower than for "entertainment settings.
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban and rural settings (2005)	Entertainment settings: No evidence for voluntary restrictions or compliance with any such restrictions (including internet cafés, karaoke bars, and mahjong parlours).	Airborne nicotine detected in 100.0% of the locations. Median level was >3 times higher than for restaurants. China did not have smoke-free regulations for these settings at this time.
Based on English language abstract of Chinese language article: Kang <i>et al.</i> , 2007 China	Telephone survey and PM _{2.5} measurements in restaurants and bars in Beijing (no year given).	Restaurants and bars: Some evidence for compliance with smoking restrictions.	Surveyed 305 restaurants and bars: 27.9% had either complete or partial smoking restrictions. Average indoor PM _{2.5} levels were less than half the levels in the restaurants and bars without smoking ban regulations. Levels in western fast-food restaurants were much lower than the levels in bars.
Lazcano-Ponce <i>et al.</i> , 2007 Mexico	Cotinine study among disco attendees (Central Region) (circa 2005)	Discos: Evidence of a lack of smoking restrictions or compliance for any that exist.	Large increases in urinary cotinine levels among nonsmokers (pre- versus post-exposure to the discos). Evidence that the average urinary cotinine value was higher in subjects who reported SHS exposure at home. This study did not indicate that any official restrictions were operational.

It appears that the general patterns at the sub-national level in Australia and the USA are fairly reflective of the national level results described above.

Relevance for evidence-based tobacco control

Policymakers and health workers need to be aware that smoking restrictions in hospitality settings may often have lower levels of public support relative to other workplaces. This suggests the desirability for obtaining representative attitudinal data in the relevant jurisdiction prior to implementing new laws. Such information can inform the need for relevant mass media campaigns and even for resourcing of enforcement activities (especially in the first few months of the operation of a new law). There are examples of successful mass media and educational campaigns, such as in California (California Department of Health Services, 2006), which have helped shift public attitudes before a new law was introduced. Norwegian data also indicate successful mass media campaigns around a new smoke-free law covering hospitality venue workplaces (Lund & Rise, 2004). Although mass media campaigns associated with new smoke-free laws have not been systematically reviewed, there is good evidence that tobacco control mass media campaigns are effective in changing attitudes and behaviour (Hopkins *et al.*, 2001; Friend & Levy, 2002; Farrelly *et al.*, 2003).

For some countries there is evidence that majority support for smoke-free restaurants and bars

may quickly develop; as a result, new legislation could be part of a comprehensive workplace law. In settings where these laws are already in place, there may be a need for ongoing monitoring or periodic research studies to evaluate compliance, or at least the extent of self-policing of the law. If compliance is low, then an option is for this to be addressed by mass media campaigns (to educate the public), improved policing of the law (by authorities or by self-policing), and increasing fines paid by venue owners (or customers) for violations. In many jurisdictions these measures can also be promoted by public health authorities through the use of media opportunities to obtain unpaid publicity (i.e. earned media).

Summary

In general, there are majority levels of public support for smoking restrictions for indoor hospitality settings in developed countries for which country level data are available. Compliance with such smoking restrictions in these settings is usually fairly substantial. In developing countries, there are fewer studies, but they generally indicate majority support. In contrast, the studies in these countries indicate poorer compliance and even apparent complete non-compliance in some settings.

Attitudes towards, and compliance with, smoking restrictions in other public places (health care facilities, schools, public transport, shopping malls, and indoor sports arenas)

This subsection covers public attitudes towards, and compliance

with, smoking restrictions in a diverse range of other indoor settings. These settings are generally workplaces, but workers may often be outnumbered by other members of the public. Some of these settings, such as schools and child day-care centres, may also have restrictions on smoking in outdoor areas as well.

Studies of these public places with country level samples are detailed in Table 5.7. Subsequent tables discuss studies on compliance with smoking restrictions in various settings (Tables 5.8 and 5.9).

The main findings from the country level studies indicate that in countries with attitudinal data there is:

- Majority public support in developed countries for smoking restrictions in hospitals, indoor sporting arenas/events, and shopping malls (with a majority of the public giving support for at least the past 15 years for some settings).
- Majority support by smokers in developed countries for some of these restrictions (e.g. for shopping malls, trains/train stations, and indoor sporting events).
- Where trend data are available, the pattern is for increasing support for such restrictions over time.

The patterns around compliance indicate fairly variable levels with smoking restrictions for schools and hospitals. However, studies of smokers indicate that smoking is rarely observed in shopping malls and public buses (where restrictions apply).

Table 5.7 Studies on public attitudes towards smoking restrictions in a range of other public settings (those not previously covered in this chapter and focusing on just multi-country and country level studies except for developing countries)

Reference/location	Study design and date	Results	Comments
Schools			
Reeder & Glasgow, 2000 New Zealand	Survey of primary and intermediate school representatives (1997)	Most school representatives (62%) thought school staff would support completely smoke-free schools.	Majority support apparent in other NZ data (see below). Survey was limited by reliance on only one school representative in each school.
Darling & Reeder, 2003 New Zealand	Survey of secondary school representatives (2002)	Most school representatives (74.1%) thought school staff would support completely smoke-free schools.	Survey was limited by reliance on only one representative per school. Views are consistent with the low smoking rates amongst teachers (Census data indicated only 8.8% of secondary school teachers were current smokers). Introduction of fully smoke-free schools in 2004 appears to have been successful (but no studies have been published).
Wold <i>et al.</i> , 2004a Eight European countries/ jurisdictions	Survey of policies and key informant interviews (1998/1999)	This study reported a lack of systems for monitoring, reporting, and evaluating smoke-free legislation relating to schools; hence a lack of attitudinal data.	Jurisdictions with smoke-free legislation: Austria, French-speaking Belgium, Finland, and Norway. Those without were: Denmark, North Rhine Westphalia region of Germany, Scotland, and Wales.
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide survey based on random representative sample of adults (2007)	Majority of adults (89%) support complete ban of smoking in schools and other educational premises.	The ban on smoking in schools and other educational premises began in 1995.
Hospitals			
Joseph <i>et al.</i> , 1995 USA	Survey of hospitals (1993)	There was evidence that patient and employee complaints about new smoking restrictions were uncommon.	Managers of smoke-free hospitals reported that patient complaints had either never occurred (33%) or occurred <1 time per month (47%). No employee disciplinary measures (74%); 1-4 (21%) since policy implemented.
National Cancer Institute, 2000; U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS) (1991-93; 1998-99; 2001-02).	By 1992-93 widespread public support (74.8%) for smoke-free hospitals.	The overall support rose from 74.8% in 1992-93 to >83% in 2001-02.
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide survey based on random representative sample of adults (2007)	Majority support (88%) for a complete ban of smoking in hospitals and other health care settings.	1995 - Smoking banned in health care facilities. There was no significant difference in support between smokers and nonsmokers and between different social strata.
Other settings			
McMillen <i>et al.</i> , 2003 USA	National telephone survey (Social Climate Survey of Tobacco Control (CSTC)) (2000, 2001)	Indoor sporting events: High levels of support (80.4% in 2001).	Support increased significantly between surveys (from 77.5% in 2000). Support in 2001 among smokers: 69.5%; nonsmokers: 83.5%.
McMillen <i>et al.</i> , 2003 USA	Social Climate Survey of Tobacco Control (CSTC) (2000, 2001)	Shopping malls: High level of support (75.3% in 2001).	Support increased significantly between surveys (from 71.4% in 2000). Support in 2001 among smokers: 60.0%; nonsmokers: 75.5%.

Table 5.7 Studies on public attitudes towards smoking restrictions in a range of other public settings (those not previously covered in this chapter and focusing on just multi-country and country level studies except for developing countries)

Reference/location	Study design and date	Results	Comments
Other settings			
U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS) (1991-93; 1998-99; 2001-02).	Indoor sports arenas: By 1992-93 there was majority public support (67.0%) and up to 77.2% in 2001-02.	By 1992-93 there was majority support in all geographic regions, age groups, both genders, education groups, income groups, main occupational groups, and ethnic groups. Support rose from 67.0% in 1992-93 to 77.2% in 2001-02. In 1992-93 the only respondents who did not indicate majority favour (>50%) were smokers (48.7%).
U.S. Department of Health and Human Services, 2006 USA	Current Population Survey (CPS) (1991-93; 1998-99; 2001-02).	Shopping malls: By 1992-93 majority public support (54.6%) for smoke-free malls.	Majority support in all geographic regions, both genders, education groups, income groups, main occupational groups, and ethnic groups. Support rose from 54.6% in 1992-93 to 76.4% in 2001-02. In 1992-93 the only respondents who did not indicate majority favour (>50%) were: 18-24 year olds (49.9%) and smokers (31.8%).
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003-04; 2004-05)	Shopping malls - smokers: Most Irish and UK smokers supported a total smoking ban in these settings (around 80% and 70% respectively*).	Level of support among Irish smokers increased after the smoke-free law at a higher rate than for UK smokers, but not statistically significantly different.
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003/4 & 2004/5)	Trains/train stations - smokers: Most Irish and UK smokers supported a total smoking ban in trains (at around 80%*). For train stations it was around 60% and 30% respectively.*	Level of support among Irish smokers increased for both trains and train stations after the smoke-free law; a statistically significant higher increase than for the UK for both settings.
Non-English language data sources reviewed in Sebie <i>et al.</i> , 2008 Argentina and Mexico	Probabilistic telephone surveys in Argentina (2006) and Mexico (2006-2007)	Majority support for smoke-free health care and educational facilities.	Support in Argentina - 96.7%. In Mexico, support for hospitals was mixed in with other public settings for which there was 75% support.
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide survey based on random representative sample of adults (2007)	Indoor cultural and art events: Majority support (84%).	1999 - Smoking banned in cultural institutions. Only slight differences in levels of support between smokers and nonsmokers and between different social strata.
California case study - other settings			
Gilpin <i>et al.</i> , 2003; Al-Delaimy <i>et al.</i> , 2008 California, USA	Regular surveys (1996 to 2005)	Schools: Vast majority (91.6%) of students support a complete ban on smoking on school grounds (69.8% for current smokers).	Support 90.5% in 2002; up from 55.8% in 1996. In 2005, 69.8% of current student smokers supported a ban.
Gilpin <i>et al.</i> , 2004; Al-Delaimy <i>et al.</i> , 2008 California, USA	Population surveys (2002)	Majority public support for smoking not being allowed (range of settings).	Common areas of hotels and motels (88.8%); common areas of apartments/-condominiums (87.1%); on-campus university housing (79.2%); hotel rooms (65.7%); Indian gambling casinos (60.1%).

*These percentages are imprecise because they are based on graphically presented results and not on exact tabulated data (which were not in the published article)

In developing countries there is a general lack of attitudinal data on these settings. Some compliance data are available and provide a more mixed picture of compliance with the smoking restrictions that exist.

With regard to “other” settings of note, this review identified few country level studies on restrictions relating to special traditional or cultural settings (e.g. just for Poland as detailed in Table 5.7). But there were no country level studies of major smoke-free religious settings (such as Mecca in Saudi Arabia) and of “smoke-free villages” adopted in some Pacific Island countries. In New Zealand, where the indigenous Maori people have increasingly adopted smoke-free marae (communal meeting places), these have been at a local tribal level and have not involved legal policies.

Discussion – public transport

There appears to be little attitudinal and compliance data relating to public transport (at least at a country level). This may partly reflect the acceptance of current practice with nearly all airlines in the world providing smoke-free aircraft. Airlines have likely become smoke-free for a mixture of reasons: to reduce the risk of fires, minimise nuisance effects to passengers, and due to health concerns by aircrew and passengers (including associated risks of legal action). Similarly, public attitudes towards smoking in trains and buses may also be influenced by this wide range of health and non-health issues, particularly where the transportation is crowded or underground (e.g. urban subway trains). These safety

issues have been important in the past, as detailed in Chapter 3. The situation may well be different in many parts of the developing world given data on the lack of compliance in transportation settings in China (Table 5.9).

Discussion – health care settings

Of all public settings, support for smoke-free hospitals may be one of the highest. National survey data for the USA reported that hospitals were the venue with the most support for being smoke-free in all three national surveys (i.e. ahead of indoor work areas, indoor sports venues, indoor shopping malls, restaurants, and bars) (U.S. Department of Health and Human Services, 2006). Despite this, compliance with smoking restrictions in health care facilities appears to be variable from the data presented in Tables 5.8 and 5.9. Yet there is other evidence suggesting improvements in air quality from smoking restrictions in such settings (see Chapter 6).

Policies for smoke-free hospitals, that include long-term residential care and acute psychiatric facilities, have been successfully introduced (Lawn & Pols, 2005; Kunyk *et al.*, 2007). But there are complex issues to address, which may potentially improve attitudinal support and compliance for the policies by health workers.

Discussion – schools

Smoke-free schools can be justified as a workplace health protection issue; both shielding the health of students and staff from SHS exposure. Some also argue that

schools and school grounds should be completely smoke-free, to not only provide smoke-free role models for students, but also to ensure consistency with the messages in school-based health education programmes (Pickett *et al.*, 1999; Reeder & Glasgow, 2000; Darling & Reeder, 2003; Darling *et al.*, 2006).

The data in Tables 5.8 and 5.9 indicate mixed compliance with smoke-free school legislation. Some studies indicate problems with compliance, for instance schools in New York State (Stephens & English, 2002), and in five US states (Wakefield & Chaloupka, 2000). Also of note is a study from Scotland that showed evidence of compliance where complete restrictions on teacher smoking existed, and students perceived smoking among teachers less often in the staff rooms (Griesbach *et al.*, 2002). However, in these schools with complete restrictions, the students observed teachers smoking more often outside on the school premises.

Teacher/staff attitudes may be a factor in the adoption of smoke-free school policies, with several studies suggesting that staff smokers may not favour smoke-free schools (e.g. three studies described in Wold *et al.*, 2004a). Logistic regression analysis of survey data from Ontario, Canada also indicated that teachers/staff who believed the restriction on smoking on school property was not effective, opposed it and desired a repeal of the restrictions (Pickett *et al.*, 1999).

Compliance in smoke-free schools might be improved by appropriate enforcement. An indirect indicator of this comes from a study that found that although the existence of school

policies that restricted smoking was not related to smoking uptake among students, when there was evidence that these policies were enforced, they were effective in reducing smoking uptake, regardless of smoking stage (Wakefield *et al.*, 2000a).

Another issue reported in the literature is that poorly designed smoke-free school legislation may hinder its acceptability and effectiveness. For example, there was evidence to suggest that in Finland, the legislation prohibiting smoking “has been interpreted to mean that smoking is permitted if certain conditions are fulfilled, even though the intention was quite clearly the creation of smoke-free schools” (Wold *et al.*, 2004a). Also, in New Zealand, the sub-optimal design of an earlier 1990 law (that just treated schools no differently from other workplaces) meant that the law did not lead to completely smoke-free environments for students (Reeder & Glasgow, 2000; Darling & Reeder, 2003). This was ultimately addressed when a new law required schools to become completely smoke-free on all school property and at all times.

Relevance for evidence-based tobacco control

There are a number of special issues that policymakers and health workers can consider when proposing smoking restrictions in settings covered here. These include:

- The crowded nature of some transportation settings (which may exacerbate risks to health and also nuisance effects).
- The special fire risks from smoking in some modes of

transportation (e.g. on aircraft, trains, subway trains, and ships), which may provide strong additional safety reasons for smoking restrictions (see Chapter 3 for safety arguments for smoking restrictions).

- The special status of health care facilities and arguments around these providing a pro-health example in the community. Some patients may also be especially vulnerable to the harm of SHS exposure. However, it may be necessary to consider special issues regarding acute psychiatric inpatient facilities and long-term residential care facilities when designing and implementing such policies.

- The special status of schools in the community, and therefore the need for coherence between teacher role modelling behaviour and smoke-free health education messages. The case is strengthened when considering that children are more vulnerable to SHS exposure than other populations (see Chapter 2). These arguments also apply to child day-care centres.

Further jurisdiction-specific data on all these issues can be obtained from conducting attitudinal studies and considering relevant research published in other settings (e.g. particularly neighbouring states, provinces, or countries).

Summary

For countries that have country level data, the available evidence indicates majority public support in developed

countries for smoking restrictions in a number of settings (e.g. hospitals, indoor sporting arenas/events, and shopping malls). A majority of smokers also support restrictions in most of these settings. The patterns around compliance indicate fairly variable levels of compliance with smoking restrictions for schools and hospitals. However, studies of smokers indicate that smoking is rarely observed in shopping malls and public buses (where restrictions apply and such studies have been conducted). In developing countries there are fewer attitudinal studies on these settings and available compliance data provides a general picture of mixed compliance with the smoking restrictions that exist. The range of settings covered here are diverse, and so policymakers and health workers should ideally consider many of the setting-specific issues involved in determining public attitudes and compliance with smoking restrictions.

Table 5.8 Studies in developed countries on compliance with smoking restrictions in a range of other public settings (those not previously covered in this chapter and focusing on just multi-country and country level studies)

Reference/location	Study design and date	Results	Comments
Schools - compliance			
Reeder & Glasgow, 2000 New Zealand	Survey of primary and intermediate school representatives (1997)	Variable compliance in primary and intermediate schools with the national legislation at the time.	Most schools (97%) reported having a current, written school smoking policy. Only 49% had policy on display, which was required. While not required by law at this time, 82% of respondents reported school buildings were totally smoke-free; 54% said schools were smoke-free in buildings and grounds.
Based on an English language abstract by Hernandez-Mezquita <i>et al.</i> , 2000 Spain	Large survey of school principals	Evidence of reduced teacher smoking in the presence of pupils (suggestive of some compliance). Suboptimal use of signage reported.	80.9% of principals claim "the fulfilment of the legislation is demanded in their centres." Only 64.9% reported having posters in their schools that warn about the smoking ban. Level of teacher smoking in the presence of pupils in schools where anti-tobacco legislation was demanded was lower compared to other schools (5.9% versus 12.9%).
Wakefield <i>et al.</i> , 2000a USA	Survey of high school students (14-17 years) (1996)	Generally poor compliance based on student perception of how many students obeyed the rule.	Based on student perceptions, enforcement was graded "weak" or "no enforcement" for 71.7% of respondents. 91.8% of respondents stated that a smoking ban existed at their school.
Darling & Reeder, 2003 New Zealand	Survey of secondary school representatives (multistage cluster sampling survey of schools) (2002)	Variable compliance in secondary schools with the national legislation at the time.	Most schools (87.7%) reported having a current, written school smoking policy. Only 25.9% had policy on display, which was required. 56.9% of school policies included guidelines regarding nonsmoking signage.
Wold <i>et al.</i> , 2004a Eight European countries / jurisdictions	Survey of policies and key informant interviews (1998/1999)	This study reported a lack of systems for monitoring, reporting and evaluating smoke-free legislation relating to schools.	See the preceding table for a list of the jurisdictions covered.
Wold <i>et al.</i> , 2004b Seven European countries / jurisdictions	Student and teacher surveys (1997-1998)	Evidence of reduced exposure to indoor smoke from teachers suggestive of some level of compliance.	Both national and school level laws restricting smoking by teachers were associated with a reduced probability of students reporting that they are exposed to teachers who smoke indoors. Conversely, there was a greater probability of students being exposed to teachers smoking outdoors. There was a clear relationship between a restrictive national policy and higher proportions of smoke-free schools.
Nebot <i>et al.</i> , 2005 Seven European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	Some evidence for compliance, though nicotine still detected in most sites.	Nicotine levels were lower in sites with smoking restrictions. Schools had lowest concentrations compared to all other public places sampled. Sweden had relatively low levels compared to the other countries (Austria, France, Greece, Italy, Portugal, and Spain).

Table 5.8 Studies in developed countries on compliance with smoking restrictions in a range of other public settings (those not previously covered in this chapter and focusing on just multi-country and country level studies)

Reference/location	Study design and date	Results	Comments
Schools - compliance			
Eaton <i>et al.</i> , 2006 USA	Annual Youth Risk Surveillance System (including national, state, and local surveys) (2004-06)	Only 6.8% of students had smoked cigarettes on school property on one of the 30 days preceding the survey (nationwide).	The prevalence of having smoked cigarettes on school property ranged from 1.7% to 10.7% across state surveys (median: 6.8%) and from 2.5% to 6.4% across local surveys (median: 4.5%).
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Educational facilities: Majority not exposed to SHS in educational facilities (87%) suggesting some compliance.	This level of no exposure (87%) was better than in government facilities (78%) and health care facilities (81%). Another 5% reported exposure of <1 hour per day.
Health care facilities and hospitals - compliance			
Joseph <i>et al.</i> , 1995 USA	Survey of hospitals (1993)	Survey data provided general evidence that hospitals had implemented and enforced smoking restrictions.	Most (65%) hospitals were compliant. Only <1% had no restrictions on smoking anywhere in the hospital. It was reported that the "the standard is well accepted by most patients and employees."
Longo <i>et al.</i> , 1996 USA	Natural experiment (hospitals and corresponding community samples) (1993-1994)	The higher quit ratios for smoke-free hospital employees provide some indirect evidence of the restrictions having an impact; hence compliance.	Employees of smoke-free hospitals had significantly higher post-ban quit ratios. This finding has been supported in subsequent work (Longo <i>et al.</i> , 2001).
Based on an English language abstract by Nardini <i>et al.</i> , 2003 Italy	Survey of hospital managers (1998)	Suboptimal compliance reported.	Insufficient or no compliance reported in 25.4%; majority (50.7%) reported no support services (e.g. smoking cessation clinic). National survey indicated 33.3% of hospital staff are active smokers and "up to 80% of them admit to smoking in the workplace." Poor response rate limits the value of this study.
Nebot <i>et al.</i> , 2005 Seven European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	Some evidence for compliance, though nicotine was still found in most of the sites studied.	Nicotine levels were lower than other public places (e.g. universities). Sweden had relatively low levels compared to the other countries (Austria, France, Greece, Italy, Portugal, and Spain). Austria had high levels due to measurements in "smoking rooms."
Other settings - compliance			
Nebot <i>et al.</i> , 2005 Seven European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	Train stations and airports: Some evidence for compliance in both these settings.	Nicotine levels were lower in sites with smoking restrictions. Despite most of these sites having smoking restrictions, appreciable concentrations of nicotine were still found. The countries were: Austria, France, Greece, Italy, Portugal, Spain, and Sweden.
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003-04; 2004-05)	Shopping malls - smokers only: Irish smokers reported that smoking had become rare in these settings after a smoke-free law.	Proportion of Irish smokers who observed smoking in these settings declined from 40% (pre-law) to 3% post-law. In the UK the levels were 29% and 22%, respectively, in this time period. See Chapter 6 for further details.

Table 5.8 Studies in developed countries on compliance with smoking restrictions in a range of other public settings (those not previously covered in this chapter and focusing on just multi-country and country level studies)

Reference/location	Study design and date	Results	Comments
Other settings - compliance			
Fong <i>et al.</i> , 2006 Ireland and UK	Prospective cohorts (2003-04; 2004-05)	Public buses - smokers only: Irish and UK smokers reported that smoking continued to be uncommon in these settings (both <10%).	The proportion of Irish and UK smokers who observed smoking in public buses (last ride) remained uncommon; changes between countries over time did not differ at a statistically significant level.
Hyland <i>et al.</i> , 2008a 32 country study*	International cross-sectional air quality study (PM _{2.5}) (2005-2006)	Various transportation settings: Air pollution from SHS was 8.3 times lower in those transportation settings with smoking restrictions.	Suggestive of compliance. Average levels of air pollution in settings with smoking were far greater than what the US EPA and WHO have concluded is harmful to human health.
California case study - other settings			
Gilpin <i>et al.</i> , 2003; Al-Delaimy <i>et al.</i> , 2008 California, USA	Regular surveys (1996-2005)	Schools: High level of compliance based on student reports of smoker compliance with school smoke-free policies.	2005 - 74.5% among nonsmokers; 67.6% among smokers (up from 40.7% for all students in 1996). 2002 - only 20.8% of students reported seeing smoking on school property in the past two weeks; declined in 2005 to 19.6%. 2005 - only 13.3% perceived that teachers smoked at school.

* Jurisdictions in this 32-country study included: Argentina, Armenia, Belgium, Brazil, Canada, China, Faroe Islands, France, Germany, Ghana, Greece, Ireland, Laos, Lebanon, Malaysia, Mexico, New Caledonia, New Zealand, Pakistan, Poland, Portugal, Romania, Singapore, Spain, Syria, Thailand, Tunisia, United Kingdom, USA, Uruguay, Venezuela, Viet Nam.

Table 5.9 Studies in developing countries on compliance with smoking restrictions in a range of other public settings (those not previously covered in this chapter and including country level, subnational and city level studies)

Reference/location	Study design and date	Results	Comments
Schools / educational facilities			
Navas-Acien <i>et al.</i> , 2004 Seven Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	Evidence suggestive of some level of compliance based on lower nicotine levels in schools relative to other public settings.	Smoking was banned in schools in most of these countries. Nicotine was still detected in 78% of secondary school samples (some with substantial amounts). Median level of nicotine was lower than for hospitals and government buildings. The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay.
Barnoya <i>et al.</i> , 2007 Guatemala, Honduras, Mexico, Panama	Measurement of airborne nicotine in multiple settings in the capital cities (2006)	Some evidence for compliance with smoking restrictions.	Nicotine levels below the limit of detection in three countries (and very low in the other one). Levels were much lower than hospitality venues and lower than government buildings and hospitals; the latter two comparisons were not statistically significant.
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban and rural settings (2005)	Evidence for some compliance with restrictions.	Airborne nicotine was detected in 78.6% of the school locations (the lowest out of all types of settings). Median level was 2-7 times lower than those for hospitals, government buildings, and transportation settings. Some Beijing schools had levels that were similar to restaurants and bars.

Table 5.9 Studies in developing countries on compliance with smoking restrictions in a range of other public settings (those not previously covered in this chapter and including country level, subnational and city level studies)

Reference/location	Study design and date	Results	Comments
Schools / educational facilities			
Przewozniak <i>et al.</i> , 2007 Poland	Air quality (PM _{2.5}) study in 60 venues in four Polish towns (2005-2006)	Some evidence of compliance with smoke-free policies.	This study was part of the 32 country study detailed in Table 5.5, but it also collected data on schools. Much lower PM _{2.5} levels were observed in schools where smoking is banned when compared with non-restricted hospitality venues.
Hospitals / health facilities			
Tsai <i>et al.</i> , 2000 Thailand	Indoor air quality sampling in venues in Bangkok (1996)	Some evidence for the lack of air pollution from smoking in nurse's dormitories associated with a hospital.	There were lower PM _{2.5} and PM ₁₀ levels of particulates indoors than ambient outdoor levels. This contrasted with the levels in shops and homes found in this study; however, these settings had other sources of pollutants (e.g. from cooking).
Navas-Acien <i>et al.</i> , 2004 Seven Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	Some limited evidence for some compliance with smoking restrictions.	Though smoking was banned in hospitals in these seven countries, nicotine was regularly detected. Median level of nicotine was lower than for hospitality settings and was comparable to levels from studies of open US offices where smoking was restricted. The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay.
Fidan <i>et al.</i> , 2005 Turkey	Surveys of workers and hair nicotine sampling in the City of Izmir (2000-2001)	Some limited evidence for compliance based on relatively low hair nicotine levels in non-smoking workers.	Smoking is restricted in Turkey's hospitals to special smoking rooms. Nicotine hair levels among hospital nonsmoking staff were much lower (5.2 times) than in nonsmoking coffee house workers. Sample sizes in this study were small.
Barnoya <i>et al.</i> , 2007 Guatemala, Honduras, Mexico, Panama	Measurement of airborne nicotine in multiple settings in the capital cities (2006)	Some evidence for compliance with smoking restrictions.	Nicotine levels were below limit of detection in three countries (and very low in the other one). Levels were much lower than hospitality venues and lower than government buildings; the latter was not statistically significant.
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban & rural settings (2005)	Limited evidence for some compliance with restrictions.	Airborne nicotine was detected in 91.4% of the locations. Median level was 2-3 times lower than those for government buildings and transportation settings. Some Beijing hospitals had levels that were similar to those in restaurants and bars.
Przewozniak <i>et al.</i> , 2007 Poland	Air quality (PM _{2.5}) study in 60 venues in four Polish towns (2005-2006)	Some evidence of compliance for smoke-free policies.	This study was part of the 32-country study detailed in Table 5.5, but it also collected data on hospitals. Much lower PM _{2.5} levels were observed in hospitals where smoking is banned when compared with non-restricted hospitality venues. Another study reported a decline in the proportion of physicians who smoke at hospital worksites (Przewozniak & Zatonski, 2002).
Other settings			
Li <i>et al.</i> , 2001 Hong Kong, China	Indoor air quality sampling in shopping malls (1999)	Shopping malls: some evidence for non-compliance with the law (from observational and air quality data).	Despite the smoke-free laws, it was reported that "during the air sampling work, illegal smoking was always found inside these malls." Conclusion: "the increased PM ₁₀ levels could be attributed to illegal smoking inside these establishments." Another Hong Kong study also found high PM ₁₀ levels at some local shopping malls with tobacco smoking (Lee <i>et al.</i> , 1999).

Table 5.9 Studies in developing countries on compliance with smoking restrictions in a range of other public settings (those not previously covered in this chapter and including country level, subnational and city level studies)

Reference/location	Study design and date	Results	Comments
Other settings			
Navas-Acien <i>et al.</i> , 2004 Seven Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	Airports: Limited evidence for some compliance with smoking restrictions.	Lower nicotine levels in airports in Argentina (domestic airport) and Costa Rica (that had smoke-free initiatives in place) were reported. Median level of nicotine lower than for hospitality settings, and was comparable to levels from studies of open US offices where smoking was restricted. The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay.
Barnoya <i>et al.</i> , 2007 Guatemala, Honduras, Mexico, Panama	Measurement of airborne nicotine in multiple settings in the capital cities (2006)	Airports: Some evidence for compliance with smoking restrictions.	Nicotine levels were much lower than hospitality venues and lower than government buildings; the latter comparison was not statistically significant. The Mexican component of this study stated that the nicotine levels in the airport “reflect the lack of compliance with mandatory non-smoking official regulations in Mexico” (Barrientos-Gutierrez <i>et al.</i> , 2007b).
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban & rural settings (2005)	Transportation settings: Evidence for general non-compliance with restrictions.	Airborne nicotine was detected in 91.7% of the locations. Median level was higher than three other types of settings, but lower than restaurants and entertainment settings, despite a smoking ban in public transportation vehicles and waiting rooms throughout the whole of China.

Attitudes towards, and compliance with, outdoor smoking restrictions (e.g. parks, sports grounds, and facility grounds)

Outdoor smoking restrictions around the world cover such settings as parks, beaches, bus stops, partly enclosed streets, grounds of health care facilities, sports stadiums and grounds, university campuses, and within specific distances from public building entryways (e.g. 20 feet of a main exit, entrance, or operable window of a public building in California). Outdoor areas within hospitality venues are also completely or partially smoke-free in some jurisdictions. Many residents also impose voluntary restrictions on

smoking on their properties, but this is considered in Chapter 8 on smoke-free homes.

This review identified few country level studies in outdoor settings; therefore, the searches were expanded to include sub-national and local studies. This identified more studies, as the focus of such restrictions appears to generally be at a local level (i.e. by local city and district governments, or at the level of specific organisations which own sports venues). Data from the limited number of published studies identified are detailed in Table 5.10.

These data indicate a wide range of levels of support for outdoor smoking restrictions. For example, for smoke-free parks, the range was

from 25% for smoke-free parks in the USA in 2001 up to 83% among park users in a New Zealand city in 2007 (Table 5.10). There is some evidence for overall support for smoke-free sports grounds in the settings where these have been studied.

While the available data are limited, there is some indication that support for restrictions on smoking in outdoor settings is less than for restrictions in indoor settings (McMillen *et al.*, 2003; Kunyk *et al.*, 2007).

All of the studies relating to compliance were suggestive of at least some level of compliance with outdoor smoking restrictions. In some settings this compliance reached high levels (e.g. sporting events in Western Australia) (Giles-Corti *et al.*, 2001).

Discussion of the results

Consideration of public attitudes concerning restrictions on outdoor smoking is particularly complex given the diversity of reasons as to why such restrictions may exist. For example, the Minnesota study (Klein *et al.*, 2007) found that reasons cited by the public for supporting smoke-free park policies included: to reduce litter (71%), to reduce youth opportunities to smoke (65%), to avoid SHS (64%), and to establish positive role models for youth (63%).

The New Zealand study also found that the main reasons people gave for supporting the policy were: positive role modelling, reducing SHS, and that 'parks are for children' (Arcus *et al.*, 2007). In contrast, the chief explanations people gave for opposing the policy were: smoking outdoors is acceptable, smokers should have the right to autonomy, and the policy will not work or cannot be enforced. Furthermore, the respondents who agreed with the policy thought the Council had implemented it because 'parks are for children,' and it reduces negative role modelling and litter. The respondents who disagreed with the policy most frequently stated that the Council implemented it for political reasons.

Other reasons cited in the literature for outdoor smoking restrictions include decreasing fire risk and protecting people from nuisances (Bloch & Shopland, 2000). But some of the public may think these reasons do not ethically justify legal controls, as some tobacco control experts have themselves suggested (Chapman, 2000, 2007).

The context of the outdoor restrictions is also likely to be important in determining attitudes and compliance. For example, in the Minnesota study where only 32% of smokers supported the policy, 59% of smokers supported smoking restrictions at youth activities, and 51% supported restrictions in areas used by children. Only 19% of smokers supported a total outdoor smoke-free requirement at all times. Furthermore, it is likely that perceptions of crowding may influence attitudes (e.g. smoking in a crowded outdoor stadium versus smoking in a park with few other people present).

Another contextual factor is the degree of signage that informs the public of the smoking restrictions. For example, the New Zealand study reported that only 62% knew that the parks were covered with a smoke-free policy, and that there was the capacity for improving the type and location of the signage. The fact that the New Zealand "policy" was not an actual bylaw that was enforced and had penalties, may also contribute to reduced compliance by the public.

In general, there appears to be a shortage of evaluation studies on smoke-free outdoor settings, despite an apparent growth of such restrictions in recent years. In particular there are little data on the following smoke-free outdoor settings: the entrances to public buildings, beaches, semi-enclosed streets, bus stops, and outside of apartment blocks.

Relevance for evidence-based tobacco control

Policymakers and health workers may find that there are already

settings in their country with majority public acceptance of outdoor smoking restrictions (e.g. in sports stadiums, child-orientated parks, and the grounds of hospitals (especially in developed countries)). Nevertheless, given the lack of data in this area, there is a strong case for obtaining representative attitudinal data in jurisdictions prior to implementing new laws (or at least data for specific groups, such as park users or hospital patients). This could then guide the need for educational campaigns, appropriate signage, and the resourcing of enforcement activities.

It is plausible that widespread restrictions on smoking outdoors may create smoker resistance to restrictions in indoor and more confined outdoor areas (i.e. if smokers consider the restrictions to lack adequate justification in a setting where societal norms are not particularly anti-smoking). There is no evidence for this type of reaction to date (at least from the studies reviewed here). Additional research on the role modelling effect of adults, on children who see them smoking in public places, is also needed to help guide the appropriate control of smoking in outdoor settings not dominated by other factors (e.g. SHS levels, nuisance effects, litter, or fire hazard).

Summary

The evidence concerning public attitudes towards outdoor smoking restrictions is limited and needs to be interpreted with care given the diversity of settings (e.g. from crowded outdoor stadiums to large

Table 5.10 Country level, sub-national and city studies on attitudes towards, and compliance with, legal smoking restrictions in a range of outdoor settings

Reference/location	Study design and date	Results	Comments
National and sub-national studies			
McMillen <i>et al.</i> , 2003 USA	Random digit dialing telephone surveys of adults (2000, 2001)	Parks: Low public support (25% overall) for smoking bans in outdoor parks.	Support in 2001 was 10% in smokers; 30% in nonsmokers. Figures for the 2000 survey were not significantly different. These levels of support were much lower than for indoor settings, which all had majority support.
Gilpin <i>et al.</i> , 2004; Al-Delaimy <i>et al.</i> , 2008 California, USA	Population surveys (2002, 2005)	Various settings: Majority support for smoking restrictions in four out of six settings.	2002 and [2005] results: Child play yards (90.5%); immediately outside building entrances (62.7% [67.1%]); outdoor restaurant dining patios (62.5% [70.0%]); outdoor bar/club patron patios (39.7%); outdoor public places (52.2% [52.4%]); outdoor work areas (42.7%). Among young adults aged 18-29 years in 2005, 30.9% supported smoke-free outdoor areas at restaurants and bars (25.5% among current smokers).
California Department of Health Services, 2006 California, USA	Population surveys (2006)	Beaches: Majority support (58.6%).	At this time 25 California beaches had smoke-free laws.
Health Canada, 2006 Canada	Canadian Tobacco Use Monitoring Survey (CTUMS) (2006)	Various settings: Outdoor exposure to SHS frequently reported which may partly relate to incomplete compliance.	Respondents reported SHS exposure in the last month at an entrance to a building (51%) and on an outdoor patio of a restaurant or bar (31%). Restrictions apply to some of these settings in some parts of Canada.
Klein <i>et al.</i> , 2007 Minnesota, USA	Mail survey of a random selection of adults (plus survey of park directors)	Parks: Among the general public, 70% favoured tobacco-free park policies. Only 32% of smokers supported the policy compared with 77% of nonsmokers.	Recreation directors, in cities without a policy, expressed a high level of concern over enforcement issues (91%). However, few problems with enforcement were reported (26%) in communities with a tobacco-free park policy. Park and recreation directors supported such policies (75%).
Studies in cities and of specific organisations			
Nagle <i>et al.</i> , 1996 Newcastle, Australia	Before and after observational study (with control hospital) (1991)	Hospital grounds: Some evidence for compliance with a new smoke-free zone around a hospital.	Statistically significant decline in observed outdoor smoking in the intervention setting (from 32% to 28%). This was slightly more than the decline in the control hospital (from 48% to 46%). See Chapter 6 for further details.
Corti <i>et al.</i> , 1997 Western Australia, Australia	Survey of organisations funded by a health promoting organisation (1993-1994)	Sports, racing, and arts venues: Majority official adoption of voluntary smoke-free area policies (average of 85%) by organisations supported by a health promotion agency.	Adoption among arts organisations (90%), sports organisations (84%), racing organisations (61%) (n=296 organisations). The extent of compliance was not detailed, but all venues had the potential for reducing outdoor exposures (especially racing venues, but also arts venues, such as music concerts).
Pikora <i>et al.</i> , 1999 Perth, Australia	Surveys and observational studies (and butt count study) (1997)	Sports grounds: There was a majority level of awareness (81%+) and agreement (79%+) with the smoke-free policies among attendees at the cricket grounds.	Policies involved smoke-free grounds with designated smoking areas (of 20% or less of the total area). Acceptance of the policies was lower among smokers (40.0% and 47.4% for the two venues). Results of the observational study and the butt count indicated that there was high compliance.

Table 5.10 Country level, sub-national and city studies on attitudes towards, and compliance with, legal smoking restrictions in a range of outdoor settings

Reference/location	Study design and date	Results	Comments
Studies in cities and of specific organisations			
Giles-Corti <i>et al.</i> , 2001 Western Australia, Australia	Various surveys and observational studies (1994-1998)	Sports grounds: Majority support by football spectators for an existing outdoor smoke-free policy. Compliance was very high.	Majority awareness of policy (81.4%); majority support (78.6%). Support less among smokers (40.0%). Observed smoking was very rare (supported with a butt count study).
Thompson <i>et al.</i> , 2006 Idaho, Oregon, Washington, USA	Survey of students in 30 colleges and universities (circa 1995)	College grounds: Majority support for some type of outdoor restriction (86.7%), but only 33.0% favoured a completely smoke-free outdoor policy.	Nonsmokers favoured some outdoor restrictions compared to smokers (91.9% versus 61.8%) and complete restrictions (38.5% versus 6.9%). (These percentages calculated from the published numbers).
Arcus <i>et al.</i> , 2007 Upper Hutt, New Zealand	Face-to-face survey of park users (plus observation study and butt study) (2007)	Parks: 83% of park users were for a "smoke-free parks policy." Most smokers (73%) also agreed with this. Some non-compliance was reported (17% of smokers who knew about the policy still smoked in the parks).	The attitudinal survey was limited to users of two parks only and may have been subject to social desirability bias (the interviewees were identified as medical students). Of smokers who did not know about the policy, 32% reported smoking in the parks. Collection of cigarette remnants over one week showed that "there is still frequent smoking in all of these parks." Observational data also indicated smoking among adults (8/488 observed) but not children (0/1013).
Kunyk <i>et al.</i> , 2007 Edmonton, Canada	Description of policy implementation (2005)	Health facility grounds: Suggested compliance with outdoor smoking ban in a large regional health authority (89 facilities).	Outdoor smoking restriction was one of many changes including closing some smoking rooms in facilities. Despite minor violations, during the early stages of its implementation and challenges in enforcing it at several sites, Capital Health has found no compelling reason to reverse the policy and now considers it to have been safely and effectively implemented in all of its facilities.
Wilson <i>et al.</i> , 2007 Hong Kong, China	Observational study (2007)	Parks and beaches: High compliance with the law on smoke-free parks and beaches (no smoking observed).	Limited validity - study involved only one observer and a small sample. An absence of cigarette butts was also noted and smoke-free signage was very prominent.

parks). There is, however, evidence of majority public support in some developed country jurisdictions for restricting outdoor smoking in select settings (e.g. on sports grounds and some parks where children or youth activities are present). The evidence relating to compliance with such restrictions is also limited, but the available data indicate that some level of compliance occurs and that this is not perceived as a major practical

problem for area administrators (e.g. park managers).

Given the growth of outdoor smoking restrictions in many developed countries in recent years, this would appear to be a priority area for further attitudinal research and studies that evaluate compliance.

Attitudes towards, and compliance with, smoking restrictions in public places in general

Attitudes towards smoking restrictions that encompass the broad domain of "public places," and which are not just workplaces, are examined here. The largest such studies have been from the Global Youth Tobacco Surveys (GYTS) (GTSS Collaborative

Group, 2006; Centers for Disease Control and Prevention, 2008). These surveys of 13-15 year olds who attend school, use a standard methodology and have had good response rates (a median response rate of 88.6%) (GTSS Collaborative Group, 2006). Overall the results indicate that there is widespread and strong support by students for restrictions on smoking in public areas all over the world. The first major compilation of these surveys for 221 jurisdictions in 123 countries (data from 1999 to 2005) put this level of support at 76.1%. The findings were in the context of students being heavily exposed to SHS (43.9% exposed at home and 55.8% exposed in public places) (GTSS Collaborative Group, 2006).

More recent results from the GYTS are summarised in Table 5.11 and demonstrate even higher levels of support at 78.3% (Centers for Disease Control and Prevention, 2008). The results demonstrate that there is a wide range of attitudinal support by jurisdiction. In three of the WHO regions, there was majority support for bans on smoking in public places within all jurisdictions surveyed. Overall, in only 8.6% of 151 jurisdictions, in which surveys were conducted, was there not majority support for such bans (with this proportion being highest in the Africa region). Indeed, majority support levels of over 80% were apparent in four out of the six WHO regions. In general, the GYTS attitudinal results

give the impression of lower levels of support in rural jurisdictions relative to more urban jurisdictions, but no formal analysis by rurality appears to have been done.

A number of countries have undertaken a second GYTS (see Table 5.12). In seven out of 10 of these countries there was an increase in attitudinal support between the two survey periods. In the Philippines, student support for bans on smoking in public places increased substantially during the 2000 to 2003 period (from 39.2% to 88.7%) (Centers for Disease Control and Prevention, 2005b).

Table 5.11 Attitudinal results from the Global Youth Tobacco Survey for 151 jurisdictions worldwide* from 2000-2007 (abstracted and calculated from Centers for Disease Control and Prevention, 2008)

WHO Region	Percent supporting ban on smoking in public places	95%CI	Range for jurisdictions within each region	Percentage of jurisdictions with <50% support (n)
African	58.9	53.0-64.6	Swaziland (26.0%) to Addis Ababa, Ethiopia (95.7%)	24.1% (7/29)
Americas	82.0	79.0-84.6	Belize (52.2%) to Suriname (91.0%)	0.0% (0/39)
Eastern Mediterranean	83.6	81.0-85.9	United Arab Emirates (71.2%) to Islamabad, Pakistan (94.5%)	0.0% (0/23)
Europe	83.1	81.2-84.7	Bulgaria (62.5%) to Albania (93.7%)	0.0% (0/29)
South East Asia	77.5	74.2-80.4	East Timor (39.9%) to Dhaka, Bangladesh (94.4%)	20.0% (2/10)
Western Pacific	83.6	81.6-85.5	Micronesia (32.5%) to Hanoi, Viet Nam (91.7%)	19.0% (4/21)
Total	78.3	75.3-81.1	Swaziland (26.0%) to Addis Ababa, Ethiopia (95.7%)	8.6% (13/151)

* GYTS data from 140 WHO member states, six territories (American Samoa, British Virgin Islands, Guam, Montserrat, Puerto Rico, and U.S. Virgin Islands), two geographic regions (Gaza Strip and West Bank), one United Nations administrative province (Kosovo), one special administrative region (Macau), and one Commonwealth (Northern Mariana Islands); nine study sites (three in the Pan-American Region and six in the Western Pacific).

Table 5.12 Changes in attitudes towards bans on smoking in public places with a comparison of results from the first and second round of the Global Youth Tobacco Survey (GYTS) for selected countries* (abstracted and calculated from Warren *et al.*, 2000 and Centers for Disease Control and Prevention, 2008)

Country by WHO regions	Study years and percent of students favouring a ban on smoking in public places				% Annual change
	Year	% (95% CI)	Year	% (95% CI)	
Africa					
South Africa	1999	53.4 (44.3-62.5)	2002	59.4 (55.3-63.5)	+2.0
Zimbabwe, Harare	1999	43.2 (32.1-54.3)	2003	43.7 (36.4-51.4)	+0.1
Americas					
Barbados	1999	79.4 (77.2-81.4)	2002	77.2 (71.6-82.0)	-0.7
Costa Rica	1999	73.5 (71.6-75.4)	2002	81.6 (78.8-84.1)	+2.7
Eastern Mediterranean					
Jordan	1999	78.3 (76.2-80.4)	2007	82.6 (80.7-84.4)	+0.5
Europe					
Poland (urban)	1999	76.5 (74.5-78.5)	2003	75.0 (72.7-77.1)	-0.4
Russian Federation, Moscow	1999	71.0 (68.9-73.1)	2004	82.6 (80.9-84.1)	+2.3
Ukraine, Kiev	1999	66.9 (64.2-69.6)	2005	83.2 (81.5-84.7)	+2.7
South East Asia					
Sri Lanka	1999	91.4 (89.0-93.8)	2003	93.0 (90.0-94.7)	+0.4
Western Pacific					
Fiji	1999	54.0 (45.8-62.2)	2005	39.1(35.4-43.0)	-2.5

*Countries which conducted the Global Youth Tobacco Survey (GYTS) in 1999 and then took part in the second round of the study; data from China were not included in the comparative analysis as surveys were conducted in different sites.

This change occurred at the time of a large reduction in exposure to SHS in public places (from 74.6% in 2000 to 59.0% in 2003). An editorial comment on these changes suggested that, "During the same period, major changes in tobacco-control policies in the Philippines might have contributed to these changes" (Centers for Disease Control and Prevention, 2005b).

In some cases the GYTS data has been analysed in more detail.

For example, in Kurdistan, Iraq, the results for supporting a ban on smoking in public places were significantly higher for never smokers than current smokers (81.2% versus 59.8%) (Centers for Disease Control and Prevention, 2006b). Ideally countries will eventually have GYTS equivalent data for adults (from the Global Adult Tobacco Surveys (GATS)), but such surveys are still fairly rare in developing countries.

Population studies on adult

public attitudes towards smoking restrictions in public places at the national level (all countries) and other levels (for developing countries) are detailed in Table 5.13. All these surveys indicate majority support for such restrictions, even amongst the smokers. This was also the case for the Chinese population (at 74% for the national survey). In a survey of 29 European countries, the lowest levels of support were in Romania (79%) and Austria (80%).

Table 5.13 Additional studies on public attitudes towards smoking restrictions in public places (where multiple public places are considered or were not otherwise specified)

Reference/location	Study design and date	Results	Comments
Multi-country and country level studies			
Yang <i>et al.</i> , 1999 China	Representative sample covering 30 Provinces (1996)	Most respondents supported bans against smoking in public places (74%).	This finding was consistent with majority support for most of the other tobacco control measures asked about (i.e. 64% for advertising bans and 83% for bans against sales to minors).
EnviroNics Research Group, 2001 India, Argentina, Russia, Japan and Nigeria	Nationally representative samples, face-to-face interviews (2000-01)	Majority support in five countries (89% overall) including majority support by smokers.	The 89% total was comprised of strong support (72%) or somewhat supportive (17%). Only 8% were opposed. The overall levels of support were 98% for Indian respondents overall (smokers [s]=98%), 94% for Argentina (s=89%), 90% for Russia (s=80%), 85% for Japan (s=73%) and 79% for Nigeria (s=64%). There was higher support by women and slightly higher support among those with higher education. The exception to the nationally representative sampling was urban sampling in Argentina and India.
Based on an English language abstract by Gallus <i>et al.</i> , 2006 Italy	National face-to-face survey (2004)	Majority support for restrictions on smoking in public places.	> 85% of Italian adult population favoured restrictions of smoking in public places (such as cafés and restaurants), and to banning smoking in workplaces.
Hammond <i>et al.</i> , 2006 Australia, Canada, UK, USA	Prospective cohorts (2002, 2003)	Smokers only: Majority agreement that: "There are fewer and fewer places I feel comfortable smoking" (81% overall for four countries).	Agreement with this statement by smokers was: 77% (UK), 78% (USA), 84% (Canada), and 84% (Australia).
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Majority support (70%) for smoke-free indoor public places (including subways, airports, shops, etc.).	Support highest in Finland (96%) and Sweden (95%) and lowest in Romania (79%) and Austria (80%). Resistance to laws strongest in Lithuania, where 9% totally opposed such restrictions. Citizens in countries where comprehensive smoke-free policies have already been introduced, such as Ireland, Sweden, and Italy, were most in favour of them. When compared to the 2005 survey, there was a slight increase in the proportion of people favouring a smoking ban in any indoor public space (+4 percentage points).
Young <i>et al.</i> , 2007 Australia, Canada, UK, USA	Prospective cohorts (2004)	Smokers only: Overall favourable support for either partial or full smoke-free restrictions in each of the four countries.	Level of support was based on total, partial, or no restrictions on indoor workplaces, bars/pubs, restaurants. Australian smokers were most supportive of restrictions at 2.49/3; smokers in Canada (2.30), the UK (2.20), and the USA (2.16). This was consistent with agreement by these smokers that tobacco products should be more tightly regulated (range: 61.7% in the USA to 68.9% in Australia).

Table 5.13 Additional studies on public attitudes towards smoking restrictions in public places (where multiple public places are considered or were not otherwise specified)

Reference/location	Study design and date	Results	Comments
Multi-country and country level studies			
Non-English language data sources reviewed in Sebrie <i>et al.</i> , 2008 Argentina, Brazil, Mexico, Uruguay	Probabilistic telephone and home surveys (except for Brazil which used convenience sampling) (2006-2007)	Majority support in these four countries of 80% and higher.	Argentina (2006) - 93.4% support for smoke-free government offices, private offices, banks, and shopping malls. Brazil (2006) - 85% support for covered public places in general. Mexico (2006-07) - 81% of smokers preferred smoke-free environments in all types of facilities (with >75% supporting smoke-free hospitals, public transportation, museums, cinemas and theatres). Uruguay (2006) - 80% support for the "100% smoke-free country" policy covering all types of facilities. In Argentina, another study reported highest support in the two smoke-free provinces, which suggested that once these laws are passed support for them grows. All other surveys reported in this review article indicated majority public support for smoke-free public places.
Studies at the sub-national and local level (developing countries)			
Yang <i>et al.</i> , 2007 China	Face-to-face survey of adults in two cities (provincial capitals) (year of survey not described)	Majority support (81.8%) for banning smoking in public places. Majority support from smokers (61.0% for heavy smokers).	81.8% supported banning smoking in public places (versus 85.7% favouring banning tobacco advertising). Significant predictors to support bans in public places: female, younger than aged 50+ years, being a professional (in occupation), and a nonsmoker. Most smokers supported bans (67.8% of light smokers and 61.0% of heavy smokers).
Bird <i>et al.</i> , 2007 Mexico	Students (11-13 years old) from randomly selected schools, Ciudad Juarez (2000)	Majority of the students favoured banning smoking in public places (85.1%).	Support was lowest in students from public low-socioeconomic status (SES) schools (79.2%) versus private high-SES schools (93.1%); this gradient was statistically significant.

Compliance with restrictions

The GYTS is also the largest international study that provides information of the general level of smoking exposure in public places outside the home (GTSS Collaborative Group, 2006; Centers for Disease Control and Prevention, 2008). "Public places" are described in a broad sense by the GYTS:

restaurants, buses, streetcars, trains, schools, playgrounds, gyms, sports arenas, and discos. The overall result was that a majority (55.8%) of students reported SHS exposure in the last seven days (see Chapter 7).

It is difficult to interpret the GYTS figures in terms of specific settings as such details were not collected in the surveys. Therefore these results could possibly reflect SHS exposure

in settings with smoking restrictions (indicating poor compliance or various exemptions to the laws), but also exposure in numerous public settings not covered by restrictions. Although many countries now have at least some restrictions on where smoking can occur (as detailed in GTSS Collaborative Group, 2006) few of these are particularly comprehensive (e.g. few cover outdoor settings,

such as streets, and a minority cover outdoor hospitality settings, such as cafés and restaurants).

Other studies relating to compliance are shown in Table 5.14. These suggest that compliance is generally poor in public places in the countries that have been studied, and in some cases it appears to be nearly non-existent. Nevertheless, the multi-country European study of nicotine in air did provide evidence for lower levels of nicotine in some smoking-restricted settings.

Discussion of the results

The general nature of the term “public places” may limit the extent to which some of the findings can be interpreted. The more setting-specific results elsewhere in this Chapter are therefore of more value in guiding decisions by policymakers and health care workers. Nevertheless, the majority support for smoking restrictions in public places (including majority support from smokers) among adults is notable. The only surveys reviewed for this setting that did not indicate a majority of attitudinal support for smoking restrictions in public places were some of the student GYTS surveys. However, only 8.6% of all the GYTS surveys (out of surveys conducted in 151 jurisdictions) had minority support (<50%). Student attitudes may potentially differ from those of adults on the basis of poorer or different knowledge of the hazards of SHS, or on perceptions of vulnerability to harm and reaction to laws passed by authorities.

The public’s desire for smoking restrictions contrasts with the high level of exposure to SHS in public

places around the world (with the GYTS results showing this clearly). Other studies indicate negligible or otherwise fairly poor compliance with smoking restrictions. Also of note are some of the general comments that come from the GTSS Collaborative Group (GTSS Collaborative Group, 2006) with regard to smoking restrictions that are not enforced:

- In Egypt: “the ban is not being enforced” (for legislation adopted in 2002). A factor here may be that the implementation “depends largely on the administration in each facility and public place.”
- In Mongolia: “the ban and restrictions are widely ignored and unenforced.”
- In Samoa: “Smoking is banned in all government buildings and hospitals, but enforcement is weak.”

Sub-optimal compliance with the law may also be partly explained by some jurisdictions having no sanctions for violations of the law. An example given here was Austria’s smoke-free law (GTSS Collaborative Group, 2006).

Summary

To date, the largest study on attitudes towards smoking restrictions in public places is the GYTS, which has examined student attitudes in 221 national and sub-national jurisdictions (with 151 jurisdictions in the most recent updated review). Overall the results indicated that there was widespread and strong support by these students for restrictions on smoking in public areas all over the world (at 76.1%; 78.3% in the more recent review). All the other studies

detailed in this subsection reported majority support for smoking restrictions in public places, including by smokers.

The GYTS study gives little clear information on compliance with existing smoking restrictions in public places, but it does show that SHS exposure is common with a majority (55.8%) of students reporting this in the last seven days. Other studies indicate negligible or otherwise fairly poor compliance with smoking restrictions in public places. Elsewhere in this chapter, attitudinal and compliance data are examined that is more setting-specific and therefore easier to interpret.

Attitudes towards, and compliance with, voluntary and legal restrictions on smoking in cars

This subsection considers both legal restrictions regarding smoking in cars, as well as the use of voluntary “restrictions” or “rules” that relate to decisions by individuals or families. When voluntary, such restrictions are likely to reflect beliefs that SHS poses a health hazard, or at least, significant nuisance effects. Similarly, the adoption of voluntary practices potentially provides some indication of the extent and strength of public attitudes towards SHS and its control. This is especially the case when smokers report having a smoke-free car. There has recently been an increase in the number of jurisdictions adopting smoke-free car laws (when children are present), because of the very high levels of SHS that can occur in the car environment (see Chapter 6); this is an area that could benefit from ongoing development.

Table 5.14 Studies on compliance with smoking restrictions in public places in developing and developed countries

Reference/location	Study design and date	Results	Comments
Multi-country and country level studies			
Yang <i>et al.</i> , 1999 China	Representative sample covering 30 Provinces (1996)	32% of respondents reported SHS exposure in public places suggesting restrictions are minimal or not complied with.	This was lower than for exposure at home (71%) but higher than for workplaces (25%).
Navas-Acien <i>et al.</i> , 2004 Seven Latin American countries	Measurement of airborne nicotine in multiple settings in the capital cities (2002, 2003)	General evidence for poor compliance in many public settings (out of those with some type of smoking restriction).	All countries had some national smoking regulations in public places (except for Argentina at the national level). The countries in this study were Argentina, Brazil, Chile, Costa Rica, Paraguay, Peru, and Uruguay. Specific results for select settings are detailed elsewhere in this Chapter (for hospitals, schools, government buildings, airports, restaurants and bars).
Nebot <i>et al.</i> , 2005 Seven European countries	Measurements of airborne nicotine (multiple settings) (2001-2002)	Some evidence for compliance overall; nicotine still found in most of the public places studied.	Nicotine levels were lower in sites with smoking restrictions. The countries were Austria, France, Greece, Italy, Portugal, Spain, and Sweden. (See other sections in this Chapter for data from this study relating to hospitals, transportation settings, restaurants, schools, workplaces and hospitality settings).
Stillman <i>et al.</i> , 2007 China	Nicotine sampling in urban and rural settings (2005)	Evidence for limited levels of compliance with restrictions in multiple settings.	Airborne nicotine was detected in 91% of the locations sampled (including hospitals, secondary schools, city government buildings, train stations, restaurants, and entertainment establishments). This was despite smoking restrictions in 34% of all the settings studied. Overall, sites which had written smoke-free regulations had statistically significantly lower nicotine concentrations.
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Majority view (54%) that compliance with the law occurs.	90% of European citizens believe that smoke-free laws exist in their country. 54% believe that the laws are respected; 36% believe that smokers do not respect these laws. The range for stating these beliefs: 21% in Slovakia, up to 91% in Ireland (and generally higher in Scandinavian countries as a group). The figure for laws existing that are respected was 4% higher overall compared to a 2002 survey in 15 EU countries. Also, the proportion saying existing laws were not respected was 6% lower.
Sub-national and city studies (developing countries only)			
Martinez-Donate <i>et al.</i> , 2005 Mexico	Household survey in Tijuana (2003-2004)	Evidence for limited compliance with restrictions overall.	Most adults (53.9%) reported chronic exposure to SHS, despite 44.4% stating that there was a nonsmoking policy in their workplace, and 65.8% had smoke-free households.
Bird <i>et al.</i> , 2007 Mexico	Students (11-13 years old) from randomly selected schools, Ciudad Juarez (2000)	No evidence of compliance with the existing smoking restrictions.	53.2% were exposed to smoking outside their homes in the past seven days (higher than exposure in the home at 41.3%). Exposure was highest in students from public low-socioeconomic status (SES) schools (72.2%) versus private high-SES schools (48.6%). With regard to smoking restrictions in public places, "the law is rarely, if ever, enforced."

The evidence from studies detailed in Table 5.15 indicates that there is majority adoption of voluntary smoke-free car policies in all the jurisdictions studied (including the smokers in most studies). One study even reported fairly high levels of smoke-free cars among smokers (70% for UK smokers) (Fong *et al.*, 2006).

The data from 29 European countries in Table 5.15 does not specifically identify adoption of smoke-free cars. Instead it indicates that a majority of respondents who are smokers in these countries claim to not smoke in the presence of nonsmokers (especially children). In particular, only 24% of smokers claimed to smoke in a car in the company of nonsmokers, which contrasted with the 49% who smoke in a car when alone. This is suggestive of either some compliance with a type of smoke-free car rule or episodic restraint in smoking behaviour.

In jurisdictions that have passed laws restricting smoking in cars there is evidence for majority support for this, for example, in the state of South Australia and for California (albeit, before the law was passed for the latter). No other studies were identified in the other states or provinces that had adopted such laws by the end of 2007 (i.e. Arkansas, Louisiana, Nova Scotia, Puerto Rico, and Tasmania). Given the recent increase in the number of such laws, this would appear to be a priority area for further research. Children are most likely to be exposed to the highest levels of SHS from others smoking in cars, and they have no easy way of avoiding it.

Relevance for evidence-based tobacco control

Policymakers and health workers, concerned about SHS exposure in cars, can probably expect to see attitudinal shifts towards smoke-free car adoption if educational levels in their country improve and they enhance tobacco control activities in general. Potential laws calling for smoke-free cars may benefit if legal restrictions are introduced on smoking in a range of other settings, such as workplaces and hospitality settings. Smoke-free schools may also alert parents to the need to protect their children from SHS in cars (and in homes). However, to appropriately inform the need for smoke-free car campaigns it is desirable that jurisdiction-specific attitudinal data and prevalence data are collected.

There remains insufficient data on the acceptability and compliance with legal interventions requiring smoke-free cars (e.g. when children are present). Nevertheless, such research is likely to be forthcoming, as a number of jurisdictions have recently adopted such laws (and states such as California have a strong record for evaluating all tobacco control interventions). There is also some suggestion of a diffusion effect here with smoke-free car laws in cities in Maine (USA) and Nova Scotia preceding state and province level laws for these two jurisdictions. Also of note is that research in the injury prevention area could also inform country-specific policymaking on smoke-free car legislation (e.g. acceptability/compliance with seat belt laws, child safety seat laws, and

laws restricting mobile phone use in cars).

Summary

The available data indicates majority public adoption of smoke-free cars (or at least reduced smoking in cars when others are present), and, in some settings, there is also majority smoker adoption of smoke-free cars. A high level of support for a law restricting smoking in cars has been reported in one setting, but further data are likely to be forthcoming as these laws are increasingly being enacted.

Discussion of chapter findings

Main findings and their level of evidence

The main findings are summarised below and are considered in terms of the level of evidence supporting them. Firstly, the evidence from developed countries is considered:

- Public attitudes towards smoking restrictions: In developed countries, there is considerable evidence to indicate that there are, in most cases, majority levels of public support for smoke-free workplaces, smoke-free hospitality settings (restaurants and bars/pubs), and various other settings (i.e. schools, health care facilities, indoor sporting arenas/events, and shopping malls).
- Smoker attitudes: While smokers are usually less supportive of restrictions than nonsmokers, there is evidence that the majority of smokers do support some

Table 5.15 Studies on the prevalence of smoke-free cars along with attitudes and compliance (country level studies plus other types of studies in jurisdictions with smoke-free car laws and in developing countries)

Reference/location	Study design and date	Results	Comments
Gillespie <i>et al.</i> , 2005 New Zealand	Telephone survey of adults (2004)	Among smokers: Minority prevalence of the adoption of, or compliance with, full smoke-free cars among smokers (29.2%) based on reported smoking behaviour. Mixed attitudinal data on acceptability of smoking in cars.	40.2% thought smoking should not be allowed in private cars; 46.0% of nonsmokers, 23.2% of smokers. 75.8% disagreed that it is "okay" to smoke around nonsmokers inside cars when there are windows open.
Fong <i>et al.</i> , 2006 Ireland, UK	Prospective cohorts (2003-04; 2004-05)	Among smokers: Majority prevalence for full smoke-free cars (range: 55% to 70%).	Adults surveyed before/after a law banning smoking in public places in Ireland; prevalence changed from 58% to 55% (not significant). For the UK, it changed from 62% to 70% (a significant increase). See Chapter 6 for further details.
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Compliance among smokers: Majority claim to not smoke in the presence of nonsmokers (especially children). This is suggestive of either compliance with a smoke-free car rule or episodic restraint in smoking behaviour.	24% of smokers smoke in a car in the company of nonsmokers. Range: 42% (Austria) to 87% (Sweden). 9% smoke in this situation when they are with children. Range: 1% (Estonia and Sweden) to 17% (Denmark), and 19% (Croatia). These figures contrast with the 49% who smoke in a car when alone. The proportion of smokers smoking in a car in the company of nonsmokers decreased by 4 percentage points relative to 2005 (decrease in Ireland - 16 points). Proportion who smoke in cars in the company of children also decreased by 5 percentage points (decrease in Spain - 17 points).
Health Canada, 2006 Canada	Canadian Tobacco Use Monitoring Survey (CTUMS) (2006)	Compliance (voluntary): Frequent exposure to SHS suggestive of incomplete adoption of, or compliance with, voluntary smoke-free cars.	A quarter (25%) of respondents reported SHS exposure inside a car or other vehicle in the last month.
Ministry of Health, 2007 New Zealand	National face-to-face survey (2006)	Majority prevalence of smoke-free cars based on reported behaviour (15% of population smoke around others inside cars).	Maori (indigenous New Zealanders) reported others smoking in the car (30.1%) compared to non-Maori (12.6%). A gradient by deprivation level was also reported, as it was in a separate observational study (Martin <i>et al.</i> , 2006).
Healton <i>et al.</i> , 2007 USA	National survey (American Legacy Foundation) (2003)	Exposure/compliance (voluntary): Significant exposure of young people to SHS in cars was suggestive of incomplete use of voluntary measures or voluntary rule compliance.	7% of young people aged 12-17 were exposed to SHS daily in a car.
Przewozniak <i>et al.</i> , 2008 Poland	Nationwide survey based on random representative sample of adults (2007)	Majority support for a complete ban of smoking in cars (64%).	No restrictions on smoking in cars existed in 2007. There were significant differences between smokers (50%) and nonsmokers (70%) in support of a ban.

Table 5.15 Studies on the prevalence of smoke-free cars along with attitudes and compliance (country level studies plus other types of studies in jurisdictions with smoke-free car laws and in developing countries)

Reference/location	Study design and date	Results	Comments
Studies in settings that have legal bans on smoking in cars (with children)			
Roberts <i>et al.</i> , 1996 South Australia, Australia	Representative survey of adults in the state (circa 1995).	Prior to the new law: A majority of adults (73%) had smoke-free cars a decade before the new law.	Among those who smoked and had children, 27.5% had a ban; an additional 6.9% said they did not smoke in the car.
Norman <i>et al.</i> , 1999 California, USA	Telephone survey of adults using random digit dialing (1996-97)	Prior to the new law: A majority (65.5%) of adults had car smoking bans (a decade before the new law).	16% of adults said smoking was sometimes allowed in cars. For smokers the prevalence of car smoking bans was 28.6%. A lower prevalence of car smoking bans was associated with being a smoker or African American, not having children in the home, having more friends who smoke, and lower household income.
Miller, 2002 South Australia, Australia	Pre- and post-campaign telephone surveys of parents (2000 & 2001)	Prior to the new law: A majority of parents (of those with cars and with children living with them) reported that they had smoke-free cars (88.4% in 2001).	Between surveys: a non-significant increase in smoke-free car prevalence (87.1% to 88.4%). Among smokers the change was from 58.0% to 63.8% (p=0.05). Other survey data indicating 81% of cars were smoke-free in 2001.
Tobacco Control Research and Evaluation, 2008 South Australia, Australia	Telephone survey of adults (random sample of the state) (2007)	Around the time of the new law: High public support on restricting smoking in cars (92%; 87% among smokers).	Law passed - 28 March 2007. Survey conducted - March/April 2007 (before it was implemented on 31 May 2007). Law relates to smoking in cars where children under the age of 16 years are present.
Al-Delaimy <i>et al.</i> , 2008 California, USA	Population survey (2005)	Prior to the new law: A majority (92.3%) were in favour of smoking bans.	The figure for smokers was 85.1%. Results were before the new law became operational in January 2008.

"Partial" refers to smoking being allowed in some parts of the home. "Full" refers to smoking not being allowed in any part of the home (or at any time in a car).

* That is excluding county and city level bans in other countries (e.g. Canada).

smoking restrictions (including hospitality settings) in a number of countries.

- Trends in attitudes: There is evidence of a pattern of increasing support by the general public and by smokers for smoking restrictions over time and after smoke-free laws are in place. No evidence was found for a reduction in public support after enacting a smoke-free law in any setting. When such laws are accompanied by public education

campaigns, there appears to be increased support for the smoke-free policy.

- Attitudes towards smoke-free cars: There is evidence for a majority voluntary adoption of smoke-free cars in developed countries, and increased willingness to legislate smoke-free cars in the presence of children.
- Attitudes towards smoke-free outdoor areas: Although there are only a few studies addressing this issue, there is evidence for

majority support for many settings (e.g. smoke-free parks, sports facilities, transition areas such as entryways, and beaches).

- Compliance with smoking restrictions: There is evidence that moderate to high levels of compliance generally occur with smoke-free laws. Nevertheless, when laws are enacted prior to mobilisation or activation of popular support, poor compliance can occur (e.g. some laws in the 1990s). International experience

suggests that compliance is higher in countries that conduct public education campaigns accompanying the law.

In developing countries there are some differences in the main findings:

- Public attitudes towards smoking restrictions: Most developing and developed countries have attitudinal data from the Global Youth Tobacco Surveys (GYTS) that indicate majority student support for smoking restrictions in public places. There are a number of studies of adult attitudes in developing countries, with most showing majority support for smoking restrictions in public places and workplaces. The Global Adult Tobacco Survey (GATS) should improve the evidence base in the future.
- Trends in attitudes: The GYTS surveys suggest a general pattern of increasing support by students over time. There is emerging evidence that new smoke-free policies increase support in some developing countries.
- Compliance with smoke-free policies: For most of the smoke-free policies in developing countries, there is evidence that meaningful compliance occurs in some settings. In settings with poor compliance, it may be that lack of awareness of the existence of the law is a factor.

Recommendations for advancing evidence-based tobacco control

Issues have been raised for informing evidence-based tobacco

control. Specific recommendations for consideration by policymakers and health professionals include the following:

1. Assessing attitudinal data among the general public, smokers, and any relevant population groups (e.g. hospitality workers) prior to new smoke-free policies being introduced can be helpful in policy development. If there is a shortage of recent representative data, then consideration should be given to undertaking attitudinal surveys within the relevant jurisdiction (e.g. the GATS). For example, such data can inform public education campaigns, use of media advocacy, and the extent of signage and enforcement activities.
2. Once smoke-free laws are passed, further monitoring of attitudes and compliance is helpful in guiding implementation, enforcement, and future policy development.
3. Public health professionals should be prepared to respond to inaccurate or misleading information regarding the effect of smoke-free policies (see Chapter 4).

Possible priorities for further research

This review has identified many areas in which further research could be undertaken. Major ones include:

- Research to address the shortage of attitudinal and compliance studies in developing countries, including the ones with the largest populations (China and India). For India, in

particular, relatively few studies were identified. Such studies are particularly desirable before new smoking restrictions are considered so that policymakers can determine the optimal scope of the new laws and the need for mass media campaigns and resourcing for signage and enforcement.

- Research to more fully analyse the existing attitudinal and SHS exposure data in the GYTS studies (e.g. ecological analyses across all the countries). Also how student attitudes compare to adult attitudes in countries with data for both. This may be increasingly possible once data are available from Global Adult Tobacco Surveys.
- Research into why public support for smoking in hospitality venues is lower than for other workplaces and how this gap can be reduced (e.g. by educating the public on workers' rights for clean air).
- Research into compliance in the many countries that have introduced new smoke-free laws covering hospitality settings in 2006-2008.
- Research into attitudes and compliance in settings that have introduced smoke-free car laws (where children are present in the car).
- Research into attitudes and compliance in smoke-free outdoor areas, which have been another area of rapid development in recent years (particularly smoke-free parks and beaches).

Countries could finance such research by introducing dedicated tobacco taxes (an approach that is already used by some developed and developing countries to fund various aspects of tobacco control). Other funding possibilities are via international research collaborations, as already seen with the successful GYTS surveys around the world.

Role of beliefs and knowledge in determining attitudes

Some of the studies in this review have touched on explanations for public support for smoke-free laws. These include public education and mass media campaigns on the hazard of SHS and on workers' rights. There is also some suggestion of spill-over effects from one area of tobacco control to another (e.g. smoke-free laws for workplaces may facilitate the adoption of smoke-free homes). More comprehensive and better resourced tobacco control activities in general may also facilitate support for expanding smoke-free laws. Indeed, once the public perceives the successful implementation of one new smoke-free law (e.g. in workplaces) they may increase support for extensions of smoke-free laws into new domains (e.g. hospitality settings).

Below the issue of beliefs in the health effects of SHS exposure is discussed. In countries for which data are available, a majority of the public now believe that SHS exposure is a health hazard for nonsmokers (Table 5.16). Also, in settings where the trend in beliefs about SHS harm have been studied, there is evidence of an increase over time in such beliefs

(U.S. Department of Health and Human Services, 2006). An additional example is California, where since 1992 the California Tobacco Surveys (CTS) have included two questions to assess the population's beliefs with respect to the dangers of SHS: "Smoke from someone else's cigarette causes lung cancer in a nonsmoker" and "Inhaling smoke from someone else's cigarette harms the health of babies and children." Agreement with the first statement increased from 62.4% in 1992 to 72.2% in 2005, and agreement with the second statement increased from 85.3% to 90.3% over this period (Al-Delaimy *et al.*, 2008).

Limitations of this review

As detailed in the Introduction, the literature search particularly focused on country level and multi-country studies for developed countries (albeit all types of studies in developing countries). Some unique settings were not substantively examined, given that public attitudes are less critical in these areas (e.g. prisons and long-term residential care settings). However, there is some consideration of the impact of smoke-free prison laws and smoke-free residential care homes in Chapter 6.

The review did not undertake a rigorous methodological critique of all the cited studies. There are limitations with questionnaire-based studies and some methods used for measuring compliance. In general, readers should put most weight on the results from the prospective cohort studies for attitudes and on large repeated cross-sectional surveys using the same methods and questions. For

compliance studies, the most robust are those that use experimental designs or objective measures (i.e. airborne particulates, airborne nicotine, biomarkers such as serum cotinine, or number of cigarette butts counted). Multi-country or country level studies are also likely to have higher methodological quality, due to study size and the need to meet quality control requirements of the funder, than small city level studies.

A general issue is that many of the reported studies rely on self-reports, which may be subject to various limitations. One of these is social desirability bias which could lead respondents to over-report smoke-free workplace or car status as social norms make smoking in these settings less socially acceptable. Smokers themselves may fear social sanction for violating legal restrictions and hence deny non-compliance. Other problems with self-reports are the ability of respondents to remember exposure to SHS in various settings (e.g. over the past week or month) or their observations of smoking in restricted settings.

There is also the more specific issue concerning the unknown generalisability of the GYTS to the attitudes held by the general adult population. Indeed, students may plausibly have stronger pro-smoke-free attitudes if they themselves have been exposed to effective school-based educational programmes, have been targeted by youth-orientated mass media campaigns (such as the "Truth" campaign in the USA), or have lower smoking rates than the adult population. This deficit in our understanding may be better addressed once Global

Table 5.16 Selected study results on beliefs about SHS and health in adults and adolescents (country level studies)

Reference / location	Study design and date	Results	Comments
Warren <i>et al.</i> , 2000 17 sites of 12 countries* representing all WHO regions	First round of the Global Youth Tobacco Surveys (GYTS) (1999)*	Majority belief by students that SHS from others is harmful to them (in 14 out of the 17 surveys).	Three survey areas where level of belief was <50%: Kiev (Ukraine), and Harare and Manicaland (both in Zimbabwe). The full range of results was from 31% in Manicaland to 81.4% in Tianjin, China.
Borland <i>et al.</i> , 2006b Australia, Canada, UK, USA	Prospective cohorts (2002)	Smokers only: Majority of smokers believe that SHS causes lung cancer in nonsmokers (all four countries >72%).	There was statistically significant variation across countries (lowest in the USA at 72.1% and highest in the UK at 82.6%).
U.S. Department of Health and Human Services, 2006 USA	National Health Interview Survey (NHIS) (1992, 2000)	80%+ believe that SHS is harmful to health.	Variation in beliefs by educational level (those with more years of education were more likely to believe that SHS was harmful).
U.S. Department of Health and Human Services, 2006 USA	Various national surveys	Majority of public consider SHS harmful.	54% considered SHS to be "very harmful" and 32% "somewhat harmful." There is some evidence that such beliefs are more common among women, younger adults, and among Hispanic/Latino and African Americans (for the latter see Yañez, 2002).
European Commission, 2007 29 European countries	Representative sampling, face-to-face interviews (2006)	Majority belief that SHS can cause health problems in all of these European countries.	Only 3% of European citizens believe that SHS exposure has no dangers at all. This figure was highest for Poland (14%) and Lithuania (8%). In Sweden, 23% reported that SHS exposure can lead to some health problems; 65% believe it can lead to cancer. Only 24% of Romanians and 17% of the Cypriot Turks believed that SHS exposure can lead to cancer. In all but two countries there were increasing proportions of people who think that cancer may result from SHS exposure (relative to the 2005 survey).
Baska <i>et al.</i> , 2007 Czech Republic, Hungary, Poland, Slovakia	Global Youth Tobacco Surveys (GYTS) (2002-2003)	Majority belief by students that SHS from others is harmful to them.	Nonsmokers: range was 65.1% to 78.0% (for boys and girls by country). Smokers: 49.5% to 55.7%.

* The 12 countries: Barbados, China, Costa Rica, Fiji, Jordan, Poland, the Russian Federation (Moscow), South Africa, Sri Lanka, Ukraine (Kiev), Venezuela, and Zimbabwe.

Adult Tobacco Survey (GATS) data become available.

Research on smoke-free homes provides some indication of the reliability of self-reports and of the impact of variation in survey methods. For example, one study in California in 1996 found a reported smoke-free home prevalence of 76% (Norman *et al.*, 1999), while another in this year reported a prevalence of 63% (the California Tobacco Survey). The difference was because the latter survey only considered a home to be smoke-free if all household adults interviewed said that it was (Gilpin *et al.*, 2002). Similarly, a study of the Current Population Survey (CPS) in the USA found that an estimated 12% of sample households provided inconsistent reports about home smoking restrictions. In particular,

multimember households with smokers were substantially less likely to consistently report strict home rules; there were discrepancies by smoking behaviour, socioeconomic status, and race/ethnicity (Mumford *et al.*, 2004). Nevertheless, there is work that is suggestive that self-reports by parents on smoke-free home rules are reasonably accurate (based on correlations with child cotinine levels) (Spencer *et al.*, 2005). Another study has reported that simple surveys inquiring about home smoking restrictions were probably adequate compared to more detailed questionnaires (Wong *et al.*, 2002). More recently one study concluded that “parental reports of household smoking alone fail to capture all youth secondhand smoke exposures, but they correlate well with cotinine levels

when expressed as the number of household smokers or the number of cigarettes smoked in the household” (Wilkinson *et al.*, 2006).

Question wording is also important and attitudes around the “rights” of workers can be particularly favoured over other attitudinal questions relating to smoking restrictions (Thomson & Wilson, 2004).

Some of the compliance studies have various limitations with regard to the measurements taken. These include problems with other sources of pollutants (e.g. fine particulates are influenced by air pollution from vehicles and from cooking) and even for the source of smoking-specific pollutants (e.g. hair nicotine levels reflect total exposure).