The Health Consequences of Involuntary Exposure to Tobacco Smoke

A Report of the Surgeon General

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Chapter 10
Control of Secondhand Smoke Exposure

their smoking. For example, one document states that "smoking bans are the biggest challenge we have ever faced. Quit rate goes from 5% to 21% when smokers work in non-smoking environments" (<http://legacy.library.ucsf.edu/tid/nyg12a00>). Another document states that "total prohibition of smoking in the workplace strongly affects industry volume. Smokers facing these restrictions consume 11%–15% less than average and quit at a rate that is 84% higher than average" (John Heironimus, memo to Louis Suwarna, January 22, 1992; <http://legacy.library.ucsf.edu/tid/rvv24e00>). The document goes on to note that "milder workplace restrictions, such as smoking only in designated areas, have much less impact on quitting rates and very little effect on consumption." The document concludes that "clearly, it is most important for PM [Philip Morris] to continue to support accommodation for smokers in the workplace." Finally, a third document states that "financial impact of smoking bans will be tremendous. Three to five fewer cigarettes per day per smoker will reduce annual manufacturer profits a billion dollars plus per year" (<http://legacy.library.ucsf.edu/tid/ijo42e00>). In fact, industry documents suggest that the concern that workplace smoking restrictions will cause smokers to quit or reduce their tobacco use is a major motivation for the industry's repeated efforts to prevent or reverse the adoption of such restrictions.

Social Norms

In addition to protecting nonsmokers from secondhand smoke and helping smokers to quit or reduce their cigarette use, it is also likely that smoking restrictions contribute to changes in public norms regarding the social acceptability of smoking, although relatively few studies have examined this issue. A study that relied on a random-digit telephone dialing survey in Massachusetts, which had a comprehensive program in place, examined the relationship between the strength of local restaurant smoking regulations and the perceived social acceptability of smoking in restaurants, bars, and in general among adults and youth (Albers et al. 2004a). The study also assessed the relationship between the strength of these regulations and perceptions of adult smoking prevalence and found that in towns with strong regulations, adults (but not youth) were more likely to consider smoking in restaurants and bars as unacceptable. In addition, adults and youth living in towns with strong regulations were generally more likely to think that most adults in their town perceived smoking in restaurants as unacceptable compared with their counterparts in towns with less stringent or no regulations. Youth who lived in towns with strong regulations were also more likely to perceive that most adults in their town disapproved of smoking in general (i.e., not just in restaurants).

Finally, in towns with strong regulations, youth, but not adults, were more likely to perceive a lower prevalence of adult smoking. The 2005 *Guide to Community Preventive Services* states that "smoke-free policies also challenge the perception of smoking as a normal adult behavior. By changing this perception, these policies can change the attitudes and behaviors of adolescents, resulting in a reduction in tobacco use initiation" (Task Force on Community Preventive Services 2005, p. 48).

A number of studies have suggested that smoke-free laws, which depend for their successful implementation on prior changes in social norms, contribute to further changes in these norms over time once they are in place (NCI 2000b; Tang et al. 2003; Gilpin et al. 2004). One implication is that the presence of smoke-free policies leads to further public support for such policies (Borland et al. 1990; Tang et al. 2003; Gilpin et al. 2004; RTI International 2004).

Economic Impact of Smoking Restrictions on the Hospitality Industry

The economic impact of smoke-free regulations on restaurants and bars has been the subject of intense debate, often at local or state levels as bans have been considered. Owners of establishments who view regulations as negatively affecting sales or other aspects of how they conduct their business are reluctant to support such measures or may oppose them. The tobacco industry has consistently claimed that such measures lead to an approximate 30 percent or greater decline in sales (Traynor et al. 1993; Glantz and Charlesworth 1999; Dearlove et al. 2002). However, the industry claims are countered by many studies published during the last decade in the peer-reviewed scientific literature that assessed various objective economic impacts of these regulations on bars and restaurants. A number of these studies are described below. Regardless of the outcome measured, the studies found no evidence of negative economic impacts.

Studies that assessed the economic impact of clean indoor air laws have generally focused on restaurants and bars. Objective indicators of an economic impact on these establishments include sales tax receipts and revenues, employment, and the number of restaurant and bar licenses issued by state health departments and state liquor authorities. Although

most of the studies have looked at sales tax data, employment and license data have the advantage of being available more quickly. Some studies have also included surveys that assessed self-reported intentions and behaviors of the customers of these food and beverage establishments. Economic impact studies have assessed the effects of both local and state clean indoor air laws.

Two of the first studies on the economic impact of clean indoor air laws on restaurants and bars were carried out by Glantz and Smith (1994, 1997). Both studies used sales tax data to assess the impact of local ordinances in California and Colorado. The first study found no effect on the fraction of total retail sales that went to restaurants or on the ratio of restaurant sales in communities with ordinances compared with restaurant sales in control communities without such ordinances that were also matched for population, income, smoking prevalence, and geographic location. The communities varied in population size from a few thousand to more than 300,000, and the length of time that the ordinances were in effect ranged from a few months to more than 10 years (Glantz and Smith 1994).

In a follow-up study that included additional analyses of sales data from the 15 cities included in the original study, Glantz and Smith (1997) again examined restaurant sales as a fraction of total retail sales before and after implementation of the ordinances. The investigators compared the ratio of restaurant sales in communities that had enacted ordinances with restaurant sales in communities without ordinances and found that local smoke-free restaurant ordinances did not have a significant effect on restaurant sales. This study also included data from seven communities in California (five cities and two counties) that had enacted ordinances requiring smoke-free bars that were matched with communities without such ordinances. The study examined sales from specific eating and drinking establishments with licenses to serve all types of liquor as a fraction of all retail sales and as a fraction of all sales by eating and drinking establishments. The authors detected no significant effect on bar sales as a fraction of total retail sales, on the ratio between bar sales in cities with and without ordinances, or on the ratio of sales from eating and drinking establishments that were licensed to serve all types of liquor compared with all sales from eating and drinking establishments (Glantz and Smith 1997). The length of time that smoke-free ordinances in bars had been in effect ranged from 25 to 65 months.

Other studies have reached similar findings. One study analyzed restaurant sales after a local ban on smoking had taken effect in a small suburb of Austin, Texas, and found, contrary to prior claims, no indication of reduced restaurant sales (CDC 1995). Other analyses of sales tax receipts have also found that over time, such ordinances had no effect on the fraction of total retail sales for eating and drinking establishments. A more recent study examined whether a smoking ban in El Paso, Texas, affected restaurant and bar revenues (CDC 2004b). In January 2002, the city implemented an ordinance banning smoking in all public places and workplaces, including restaurants and bars. The study, which examined sales tax and mixed-beverage tax data from 12 years before and 1 year after the ordinance was implemented, found that there were no statistically significant changes in restaurant and bar revenues after the ordinance was implemented.

Using taxable sales data from eating and drinking establishments in New York City, Hyland and colleagues (1999a) observed a 2.1 percent increase in sales following implementation of a citywide smoking ban in restaurants compared with sales two years before the law took effect. At the same time, taxable sales in eating and drinking establishments in the rest of the state declined by 3.8 percent. Using a nonrandomized pretest/posttest design and controlling for seasonal effects, Bartosch and Pope (1999) examined the impact of smoke-free restaurant ordinances in 35 cities and towns in Massachusetts between January 1992 and December 1995. The authors used aggregate meal tax data collected by the Massachusetts Department of Revenue before and after the ordinances took effect. The number of restaurants per community varied considerably, from less than 10 to more than 150. Cities and towns without a smoke-free restaurant policy served as comparison communities. The study documented that the enactment of a local smoke-free restaurant ordinance was not followed by a statistically significant changes in the taxable meals revenue that the town collected (Bartosch and Pope 1999).

An in-depth analysis of California tax revenue data from 1990 to 2002 found that the 1995 statewide smoke-free restaurant law was associated with an increase in restaurant revenues. The analysis also found that the 1998 statewide smoke-free bar law was associated with an increase in bar revenues (Cowling and Bond 2005).

Finally, a study of the California smoke-free bar law found that the proportion of bar patrons who reported that they were just as likely or more likely to visit bars that had become smoke-free increased from 86 percent three months after the law took effect in 1998 to 91 percent in 2000 (Tang et al. 2003).

A recent report from New York City assessed all four economic indicators (sales tax receipts, revenues, employment, and the number of licenses issued) and found no negative impact on restaurants and bars from city and state clean indoor air laws (New York City Department of Finance 2004). This study specifically examined various time periods before and after the laws took effect and reported increases in all four economic measures. Restaurant and bar business tax receipts had increased by 8.7 percent; employment in restaurants and bars had increased by about 2,800 seasonally adjusted jobs, amounting to an absolute gain of about 10,600 jobs; and there was a net gain of 234 active liquor licenses for restaurants and bars out of a total of 9,747 such licenses. In addition, a majority of respondents to a Zagat survey and a Zogby poll reported that the smoking restrictions would not have any effect on their patronage of restaurants and bars (New York City Department of Finance 2004). Moreover, the number of respondents who would patronize these establishments more frequently as a result of these restrictions exceeded the number of respondents who said their patronage would decrease. An evaluation of the New York state tobacco control program reached similar findings regarding the economic impact of New York's statewide smoke-free law. The report found that this law had no impact on sales in full-service restaurants and bars (New York State Department of Health 2005).

Studies have also assessed the economic impact of smoke-free restaurant laws on tourism. Glantz and Charlesworth (1999) examined hotel revenues and tourism rates in six cities before and after passage of 100 percent smoke-free restaurant ordinances and compared these revenues and rates with those of U.S. hotels overall. The results indicated that smoke-free restaurant ordinances do not adversely affect tourism revenues and may, in fact, increase tourism (Glantz 2000). More recently, Dai and colleagues (2004) used a variety of measures to assess the impact of a state clean indoor air law in Florida on gross sales and employment levels in the leisure and hospitality industry throughout the state and, more specifically, on restaurants, hotels, and tourism (Dai et al. 2004). The study found increases in the fraction of retail sales from restaurants, lunchrooms, and catering services and increases in the fraction of employment in drinking and eating places and the fraction of employment in the leisure and hospitality industry as a whole following implementation of the law. There were no significant changes in the fraction of retail sales from taverns, night clubs, bars, liquor stores, and recreational admissions or in the fraction of employment in the hospitality industry after the law took effect. The authors concluded that they were not able to detect a significant negative effect of the state law on sales and employment in the leisure and hospitality industry. The study analyzed sales data from restaurants, lunchrooms, and catering services separately from sales data for taverns, night clubs, and bars, thus addressing a concern that analyzing sales data from eating and drinking places combined could potentially blur differential impacts on these sectors. Interestingly, the study found that the fraction of retail sales for restaurants, lunchrooms, and catering services (which were covered by the law) increased following implementation of the law, but the corresponding fraction did not increase for taverns, night clubs, and bars (which were not covered by the law). These findings suggest that there was no shift in patronage from hospitality venues that were required to be smoke-free to hospitality venues where smoking was still allowed.

Few studies have examined the impact of smoking restrictions on gaming venues (such as casinos), which may be due in part to the fact that, until recently, few gaming venues in the United States have been included in governmental smoking restrictions; some venues have implemented significant voluntary smoking policies of their own. A linear regression analysis of the economic impact of a comprehensive state smoke-free law on casinos in Delaware that drew on revenue data from the Delaware Video Lottery found that the law had no significant effect either on total revenues ($p = 0.126$) or the average revenue per video lottery terminal ($p = 0.314$) (Mandel et al. 2005). The study controlled for economic activity and seasonal effects. In another study, researchers analyzed financial information reported to the State Lottery Commission. Local ordinances in Massachusetts that made charitable bingo venues smoke-free did not appear to negatively affect the profits from those venues (Glantz and Wilson-Loots 2003).

Discrepancies between economic impact studies of clean indoor air laws conducted either by the tobacco industry or by non-industry–supported scientists can be traced in part to variations in the types of data analyzed. Studies commissioned by or for the tobacco industry to assess the economic impact of smoke-free restaurant and bar regulations have generally relied on proprietor predictions or estimates of changes in sales, rather than on actual sales or revenue data. Such estimates are subject to significant reporting bias and are viewed with skepticism because they do not constitute empirical data. Scollo and colleagues (2003) investigated the possible causes of these discrepancies by examining the quality of studies on

economic effects of smoke-free policies. Studies showing a negative economic impact that was attributed to clean indoor air laws were 4 times more likely to have used a subjective outcome measure and 20 times more likely not to have been subject to peer review than studies that found no adverse economic impact. All of the studies that found a negative economic impact were supported by the tobacco industry (Scollo et al. 2003). No peer-reviewed study using objective indicators such as sales tax revenues and employment levels found an adverse economic impact of smoke-free laws on restaurants and bars.

In assessing the economic impact of smoke-free policies and laws, their beneficial effect in reducing health care costs must also be weighed. One study using a simulation model projected that implementation of smoke-free policies in all U.S. workplaces would result in 1.3 million smokers quitting, 950 million fewer cigarette packs being smoked, 1,540 myocardial infarctions and 360 strokes being averted, and $49 million in direct medical cost savings being realized, all within the first year (Ong and Glantz 2004). The number of acute health events averted and the costs saved would increase over time. The model took into account both the impact of smokers quitting and the impact of the elimination of workplace secondhand smoke exposure among nonsmoking employees, with reduced secondhand smoke exposure accounting for 59 percent of the averted myocardial infarctions and 50 percent of the cost savings from averted myocardial infarctions during the first year (Ong and Glantz 2004).

The 2005 *Guide to Community Preventive Services* concluded that "we found no adverse impacts on business or tourism as a result of these policies" (Task Force on Community Preventive Services 2005, p. 49). Recently, some business organizations have come to the conclusion that smoke-free policies and laws can actually have a positive economic impact, as reflected not only in increased productivity and savings in employee health care costs, other insurance costs, and cleaning and maintenance costs, but also in the image and business climate of a community. For example, the Chamber of Commerce in Louisville, Kentucky, recently came out in support of a proposed municipal smoke-free ordinance. The president of the Chamber explained that "We believe that this piece of legislation … has reasonable controls and is responsible in terms of really making a difference in the community and ultimately helping us reach our vision of becoming an economic hot spot" (Gerth 2005). "We would generally be in favor of less regulation," said Carmen Hickerson, a spokeswoman. "But quality-of-life issues are decisions that factor in to economic development. Those things have as much, or more, weight than traditional economic development tools, such as tax breaks" (Vereckey 2005).

Household Smoking Rules

Home smoking restrictions are private household rules that are adopted voluntarily by household members. They can include comprehensive rules that make homes smokefree in all areas at all times and less comprehensive rules that restrict smoking to certain places or times (e.g., allowing smoking only in specific rooms, designating certain rooms as smoke-free, allowing smoking only when no children are present, etc.) (Pyle et al. 2005). The only approach that effectively protects nonsmokers from secondhand smoke exposure is a rule making the home completely smoke-free (Levy et al. 2004).

Smoke-free home rules and other home smoking restrictions may be implemented for a variety of reasons, including

- to protect children in the household from secondhand smoke exposure;
- to protect pregnant women in the household from secondhand smoke exposure;
- to protect nonsmoking spouses or other nonsmoking adult household members from secondhand smoke exposure;
- to protect children or adults who have health conditions that are exacerbated by secondhand smoke exposure or who are at risk for health conditions that can be triggered by secondhand smoke (e.g., a child with asthma, an adult with or at special risk for heart disease);
- to help smokers in the household cut down their cigarette consumption;
- to help smokers quit;
- to help smokers who have quit maintain abstinence;
- to set a positive example for children and youth in the household, to prevent them from becoming smokers themselves;