

# PostScript

## LETTERS

### Exposure to environmental tobacco smoke at work and at home: a population based survey

Environmental tobacco smoke (ETS) has been shown to be carcinogenic for humans<sup>1</sup> and has emerged as an important public health problem in recent years.<sup>2,3</sup> In Southern European countries like Spain, this problem is especially relevant because of the high prevalence of smoking.<sup>4</sup> Yet, unlike for active smoking, we have little objective data about the extent of ETS exposure in the general population. This study provides an updated estimate of the prevalence of exposure to major sources of ETS and analyses some relevant related factors in a representative sample of the general population in a South European urban context.

The population frame was the non-institutionalised population of the Spanish city of Barcelona in the year 2000 (1 600 000 inhabitants). Data were collected as part of the Barcelona Health Interview Survey 2000,<sup>5</sup> a cross sectional survey carried out approximately every five years since 1983. We generated a representative stratified sample of the non-institutionalised population of Barcelona residents. The sample strata were the 10 Barcelona city districts. In each stratum a random sample of residents was obtained, the sample unit being the individual. The sample size was 10 000 people, accounting for an  $\alpha$  error of 4.5% and a maximum global error of 1%, this global error being half the width of the desired sample confidence interval. The information was collected through face-to-face interviews carried out at home, between February 2000 and March 2001. The present study was conducted on the population aged 15-64 years.

People who smoked daily one or more cigarettes at the time of the survey were considered as smokers. The survey included several questions related to smoking, two of which refer specifically to passive smoking: "does some member of your family usually smoke at home?" and "at your work, how many hours a day are you with smokers?"

The results (table 1) clearly indicate that passive smoking is a major public health problem in our context, as more than two thirds of the population (69.7%) report being exposed to secondhand smoke, 22.6% being exposed at work and at home, 29.7% only at work, and 17.5% only at home. In the analysis by sex, women are more exposed at home only (23.5% v 12.6% of men), while men are more exposed at work only (34.2% v 24.2% women). Finally, it is of particular importance to highlight that 60% of non-smokers are exposed to some extent and that 14.2% of them are exposed both at home and at work, exposure that may have serious effects upon their health.

In comparison to other studies that have measured ETS exposure with surveys, the percentages of subjects exposed in the workplace and at home obtained in this study are lower than a decade ago in Spain (60% and 53.7%, respectively).<sup>6</sup> However, the percentage of people exposed is still higher than that found in the USA as reported by the NHANES III study, where only 39.2% declared being exposed.<sup>7</sup> Overall, these data are consistent with a progressive reduction of smoking and ETS exposure in Europe, which has not yet reached the levels of reduction observed in the USA. Unlike biomarkers and airborne markers, questionnaires reflect perceived exposure and may result in misclassification, usually yielding an underestimate of exposure to ETS.<sup>8</sup> However, they are valid enough to give population estimates for comparison or surveillance purposes.<sup>9</sup> The present study was carried out among a representative sample of the general population, and the response rate at first contact was 85.9%, therefore selection bias can be virtually ruled out. The question about exposure at work, however, may have overestimated the exposure because some respondents may have answered positively, meaning to be "with smokers" instead of "with people smoking". On the other hand, main confounding factors may have been corrected for by stratifying the analysis by sex and smoking status.

Despite progress achieved in the last 15 years through progressive and continuing changes in policy and legislation,<sup>10</sup> more effort must be made to change the social

norm regarding acceptability of involuntary exposure to passive smoking, especially in the workplace. Complementary efforts are required to increase social awareness of the health effects of smoking to decrease the exposure at home, especially for families living with children, as well as to prompt improvements in legislation about smoke-free places and their implementation.

M Nebot, M J López, Z Tomás, C Ariza, C Borrell, J R Villalbí

Agency of Public Health, Barcelona, Spain

Correspondence to: M<sup>o</sup> J López, Health Promotion Service, Public Health Agency, Pl. Lesseps 1 Barcelona 08015, Spain; mjlopez@imsb.bcn.es

## References

- 1 International Agency for Cancer Research. IARC Monographs (Vol 83). *Tobacco Smoke and Involuntary Smoking*. June 2002.
- 2 National Cancer Institute. Health effects of exposure to environmental tobacco smoke. The Report of the California Environmental Protection Agency. Monograph 10, 1999.
- 3 Law MR, Hackshaw AK. Environmental tobacco smoke. *Br Med Bull* 1996;**52**:23-34.
- 4 Fernandez E, Schiaffino A, Borrás JM, et al. Prevalence of cigarette smoking by birth cohort among males and females in Spain. 1910-1990. *Eur J Cancer Prev* 2003;**12**:57-62.
- 5 Borrell C, Baranda L, Rodríguez M. Enquesta de Salut de Barcelona 2000-2001. Ajuntament de Barcelona, Institut Municipal de Salut Pública. November 2001.
- 6 Reif K, Marlier E. Eurobarometer 43.0. Cross-border Purchases, Smoking Habits and Cancer Risks. March-April. European Commission. ICPSR, 1995.
- 7 Mannino D, Siegel M, Rose D, et al. Environmental tobacco smoke exposure in the home and worksite and health effects in adults: results from the 1991 National Health Interview Survey. *Tobacco Control* 1997;**6**:296-305.
- 8 Von Eyben FE, Zeeman G. Health risk from active and passive smoking. *Rev Esp Salud Publica* 2003 Jan-Feb;**77**:11-36.
- 9 Hovell MF, Zakarian JM, Wahlgren DR, et al. Reported measures of environmental tobacco smoke exposure: trials and tribulations. *Tobacco Control* 2000;**9**(suppl III):ii22-8.
- 10 González-Alonso J, Salvador T, Villalbí JR. El reto del control del tabaquismo en el lugar de trabajo. *Rev Esp Salud Pública* 2003;**77**:1-2.

**Table 1** Percentage of subjects exposed to environmental tobacco smoke at home and in the workplace by sex and smoking status (Barcelona Health Interview Survey 2000)

Smoking status†	Sex‡	Place of exposure*				n (100%)
		Home and work % (n)	Only home % (n)	Only work % (n)	None % (n)	
Smokers	Men	38.1 (380)	13.2 (132)	32.9 (328)	15.8 (158)	998
	Women	29.7 (208)	26.2 (184)	25.6 (180)	18.5 (130)	703
	Total*	34.6 (588)	18.6 (316)	29.9 (508)	16.9 (288)	1701
Non-smokers	Men	14.1 (179)	12.1 (154)	35.0 (447)	38.9 (496)	1276
	Women	14.3 (163)	21.8 (248)	23.3 (266)	40.6 (463)	1140
	Total*	14.2 (342)	16.6 (402)	29.5 (713)	39.7 (959)	2416
Total	Men	24.6 (559)	12.6 (286)	34.1 (775)	28.7 (654)	2274
	Women	20.1 (371)	23.5 (432)	24.2 (446)	32.2 (593)	1843
	Total*†	22.6 (930)	17.5 (719)	29.7 (1221)	30.3 (1247)	4117

\*Significantly ( $p < 0.005$ ) different by place of exposure.

†Significantly ( $p < 0.005$ ) different by smoking habit.

‡Significantly ( $p < 0.005$ ) different by sex.