

## Mortality Attributable to Smoking in China

**TO THE EDITOR:** Gu and colleagues (Jan. 8 issue)<sup>1</sup> report that in 2005, an estimated 673,000 deaths in China were attributable to smoking. The study is of timely importance. But it did not include some important variables in the analysis. First, the effects of family income were not considered. In China, social deprivation is a major risk factor for ill health,<sup>2</sup> and data from a survey about household income and cigarette consumption<sup>3</sup> and from a study involving low-income employees<sup>4</sup> showed that smoking was associated with relatively high income. Without this adjustment, the association of mortality with smoking may have been attenuated. Second, the analysis did not include passive smoking. Nonsmokers may have been exposed to passive smoking, leading to the higher mortality in the reference group. Third, the number of deaths in rural China, where 70% of the population lives, may have been underestimated. It is interesting that the authors observed a lower relative risk of death associated with smoking in rural areas than in urban areas. In rural areas, persons who never smoked would be poorer and consume less nutritious foods than their counterparts who smoked and thus would have a higher mortality, reducing the association.

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1. Gu D, Kelly TN, Wu X, et al. Mortality attributable to smoking in China. *N Engl J Med* 2009;360:150-9.
2. Pei X, Rodriguez E. Provincial income inequality and self-reported health status in China during 1991-7. *J Epidemiol Community Health* 2006;60:1065-9.
3. Hu TW, Mao Z, Liu Y, de Beyer J, Ong M. Smoking, standard of living, and poverty in China. *Tob Control* 2005;14:247-50.
4. Hesketh T, Lu L, Jun YX, Mei WH. Smoking, cessation and expenditure in low income Chinese: cross sectional survey. *BMC Public Health* 2007;7:29.

**THE AUTHORS REPLY:** In response to Chen: as we discussed in our article, one limitation of our study

is that we were unable to adjust for some important potential confounding factors. Data on family income were not collected in our study. However, we collected data on and adjusted for levels of education and work-related physical activity, two important indexes of socioeconomic status that were highly related to family income.<sup>1</sup> Furthermore, relative risk, population attributable risk, and mortality were calculated separately for rural and urban residents; this should have eliminated the confounding effects of rural-urban differences in family income. We adjusted for the body-mass index, a measure of malnutrition in our study. In addition, only deaths from cardiovascular disease, cancer, and chronic respiratory disease were associated with cigarette smoking and included in the estimation of smoking-related deaths. There is no evidence that these diseases are caused by malnutrition. We agree that passive smoking has been associated with death from coronary heart disease and lung cancer,<sup>2,3</sup> and we noted that our study might have underestimated the deaths from these diseases that were attributable to smoking.

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1. Jing Y. Analysis of population structure in rural areas of China. *Chin J Popul Sci* 1998;10:17-30.
2. He J, Vupputuri S, Allen K, Prerost MR, Hughes J, Whelton PK. Passive smoking and the risk of coronary heart disease — a meta-analysis of epidemiologic studies. *N Engl J Med* 1999; 340:920-6.
3. Department of Health and Human Services. The health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General — executive summary. Washington, DC: Government Printing Office, 2006.

## Endometriosis

**TO THE EDITOR:** In the review article on endometriosis, Bulun (Jan. 15 issue)<sup>1</sup> states that the presence of aromatase in endometriotic lesions appears to play an important role in the production of es-

tradiol, and it is considered to be a key factor for endometrial proliferation.

However, Delvoux et al. recently reported the absence of aromatase activity in endometriotic le-