What this paper adds

This paper updates the estimates of smoking-attributed mortality for 41 developed countries to the most recent year for which data are available and proposes a modification of the criteria that define the stages of the cigarette epidemic to allow different stages for men and women. The sex-specific criteria are more generalizable to developing countries than those proposed by the earlier model.

What is already known on the subject

A four-stage model of the cigarette epidemic in developed countries was proposed in 1994 to communicate the long delay between the widespread uptake of cigarette smoking and its full effects on mortality. This model defined the stages of the epidemic based on the comparative levels of smoking prevalence and smoking-attributed mortality in men and women, as had been experienced in economically developed countries.

to smoke substantial numbers of cigarettes when young and do not stop will eventually be killed by smoking (although they would invalidate indirect estimation of smoking-attributable mortality in many developing countries from absolute lung cancer rates). For example, studies in China[4 5] and India[6 7] have found comparably high levels of mortality from smoking, suggesting in both cases that about half of those who start early are killed by smoking (even though, on average, lung cancer rates are much higher in China than in India, partly because there has been heavy domestic air pollution in many parts of China from cooking and heating).

Ultimately, the importance of any model of the epidemic is to help communicate the future health effects of current smoking. The original and the revised model emphasise the long delay between a large increase in smoking in a particular generation of young adults and the full increase in smoking-attributed mortality when that generation reaches middle and old age, and stage 3 of the revised model describes the apparently paradoxical period when cigarette consumption is falling yet smoking-attributed mortality is still rising as a delayed result of earlier increases in smoking. Despite this, however, it is still true that populations and individuals who smoke can by cessation greatly reduce the mortality rates they would otherwise have suffered.

Competing interests None.

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Invited commentary

Hong Kong started to collect smoking prevalence data from 1982. Male smoking prevalence in Hong Kong is decreasing, from 39.7% in 1982 to 19.9% in 2010. Thus, Hong Kong's smoking trend for male smokers appears similar to those of Australia and the USA. It is likely that our male smoking is at present at stage 3 of the model, in which although smoking prevalence is decreasing, the smoking attributed mortality will be increasing. While longitudinal data on smoking attributable mortality are not available in many developing countries and their cities, the experience of developed countries, as summarised in this model, is very helpful in communicating to policymakers the likely impacts of future disease effects of smoking. This model is a useful reference for the planning of smoking related services and programmes. In view of the situation of Hong Kong, and the fact that smoking cessation can greatly reduce mortality rates, it is reasonable to focus efforts in Hong Kong on encouraging male smokers to quit. This should slow the increase of smoking attributed mortality.

For female smoking, the rate in Hong Kong is also decreasing slowly, from 5.6% in 1982 to 3.0% in 2010. We agree that the female smoking trend of the developed countries is not applicable to our city, and it is difficult to predict when or if women

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will begin smoking in large numbers. In order to prevent the possible increase and the burden this will bring, we in Hong Kong have launched various educational and publicity programmes targeting female smokers with the main purpose of discouraging the uptake of smoking. The response is good; therefore, we are confident that the female smoking rate will remain at a plateau or even further decrease in the coming years.

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