Emerging tobacco hazards in China: 2. Early mortality results from a prospective study
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Abstract

Objective To monitor the evolving epidemic of mortality from tobacco in China following the large increase in male cigarette use in recent decades.

Design Prospective study of smoking and mortality starting with 224,500 interviewees who should eventually be followed for some decades.

Setting 45 nationally representative small urban or rural areas distributed across China.

Subjects Male population aged 40 or over in 1991, of whom about 80% were interviewed about smoking, drinking, and medical history.

Main outcome measure Cause specific mortality, initially to 1995 but later to continue, with smoker versus non-smoker risk ratios standardised for area, age, and use of alcohol.

Results 74% were smokers (73% current, only 1% former), but few of this generation would have smoked substantial numbers of cigarettes since early adult life. Overall mortality is increased among smokers (risk ratio 1.19; 95% confidence interval 1.13 to 1.25, P < 0.0001). Almost all the increased mortality involved neoplastic, respiratory, or vascular disease. The overall risk ratios currently associated with smoking are less extreme in rural areas (1.26, 1.12, or 1.02 respectively for smokers who started before age 20, about half of all persistent cigarette smokers is particularly high in China, so the mortality ratio is less extreme in China than in countries where cigarettes have been used widely for several decades. However, the background mortality (except for ischaemic heart disease) among non-smokers is particularly high in China, so the mortality from tobacco is already substantial. About 1990 smoking was already responsible for about 12% of Chinese adult male deaths, which corresponds to 0.7 million male deaths in the year 2000 from tobacco (or somewhat more as the percentage increases).

Discussion

This nationally representative, prospective study shows that smoking is already an important cause of neoplastic, respiratory, and vascular death in Chinese men. This is consistent with smaller prospective studies in particular parts of China and with a retrospective study of one million deaths. For many conditions that can be caused by tobacco, the smoker/non-smoker mortality ratio is less extreme in China than in countries where cigarettes have been used widely for several decades. However, the background mortality (except for ischaemic heart disease) among non-smokers is particularly high in China, so the mortality from tobacco is already substantial. By about 1990 smoking was already responsible for about 12% of Chinese adult male deaths, which corresponds to 0.7 million male deaths in the year 2000 from tobacco (or somewhat more as the percentage increases). Yet it is only recently that the full size of the US hazard became


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clear. For although the main increase in US cigarette use took place before 1950 (in 1910, 1930, and 1950 the mean consumption among US adults aged over 15 was 1, 4, and 10 cigarettes a day respectively), the main increase in US tobacco mortality took place after 1950, when those who had started smoking substantial numbers of cigarettes in early adult life reached middle and old age. Of all US deaths at ages 35-69, the proportion attributable to tobacco in 1950 was only 12%, rising to 33% in 1990, when the increase in US male tobacco deaths had been completed.7 Recent prospective studies of US and UK male smokers correctly indicate that about half are killed by tobacco, but similar studies in other countries, 1960s, before the main mortality increase was completed, misleadingly indicated that “only” a quarter would be. In China as a whole, the all cause mortality for men aged 40-79 in 1992-5: risk ratios and their floated standard errors.2 The proportions starting at ages <20, 20-4, and ≥25 were respectively: urban 26%, 39%, and 35%; and rural 32%, 42%, and 26%. Hence, for the whole study (and hence for all China) the corresponding risk ratios were 1.34, 1.18, and 1.05 respectively: urban 26%, 39%, and 35%; and rural 32%, 42%, and 26%. Hence, for the whole study (and hence for all China) the corresponding risk ratios were 1.34, 1.18, and 1.05.

**Key messages**

- In recent years most young men in China have become persistent cigarette smokers, starting at about age 20; this will cause high mortality in middle age and old age.
- Currently, however, most middle aged and older smokers (particularly in rural areas) have not persistently used substantial daily numbers of cigarettes ever since they were young adults, so their current tobacco attributed mortality is more limited.
- Nationally representative retrospective and prospective studies show that in about 1990 “only” about 12% of adult male deaths in middle age were caused by smoking.
- Continuation of the present prospective study will monitor the growth of the epidemic of tobacco related deaths in China over the next few decades already approaching 2, suggesting that about half will be killed by tobacco.

The main increase in cigarette consumption in China took place only recently (in 1952, 1972, and 1992 the mean consumption among Chinese men was 1, 4, and 10 cigarettes a day respectively), so on present day smoking patterns Chinese tobacco mortality will increase substantially. Of all male deaths at ages 35-69 the proportion attributed to tobacco will rise between 1990 and 2030, from 12% to about 33% (as happened previously in the United States) because both in urban and in rural China two thirds of young men (but currently few young women) become cigarette smokers, and cessation is rare. Long term continuation of this prospective study, with periodic resurveys of all middle aged adults living in the study areas, will monitor the evolution of the epidemic.

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