Background: Future World Tobacco Deaths

If current smoking patterns persist then worldwide mortality from tobacco is likely to rise from about 3 million deaths a year in 1990 to about 10 million a year in 2030, indicating that tobacco will cause about 150 million deaths in the first quarter of the century and 300 million in the second quarter. These numbers cannot be greatly reduced unless a substantial proportion of the adults who have already been smoking for some time give up the habit. For, a decrease in the proportion of children who become smokers will not have its main effects on mortality until the third quarter of the century.

Not starting: If, by progressive reduction over the next decade or two in the global uptake rate of smoking by young people, the proportion of young adults who become smokers were to be halved by 2020 then this would avoid hundreds of millions of deaths from tobacco after 2050. It would, however avoid almost none of the 150 million deaths from tobacco in the first quarter of the century, and would probably avoid "only" about 10 or 20 million of the 300 million deaths from tobacco in the second quarter of the century.

Quitting: If, however, many of the adults who now smoke were to give up over the next 20 years, halving global cigarette consumption per adult by the year 2020, then this would prevent about one third of the tobacco deaths in 2020 and would halve tobacco deaths in the second quarter of the century. Such changes would avoid about 20 or 30 million tobacco deaths in the first quarter of the century and would avoid about 150 million in the second quarter.

Britain, which is now experiencing the most rapid decrease in the world in premature deaths from tobacco, shows that large improvements are possible over a few decades. From 1965 to 1995 annual UK cigarette sales fell from 150 billion to 80 billion, annual UK tobacco deaths in middle age (35-69) decreased from 80,000 to 40,000 and as, over the next decade or two, those now in middle age reach old age, UK mortality in old age from tobacco should also decrease substantially.

Unfortunately, however, although there have been decreases in the prevalence of smoking in some countries, there have been increases elsewhere. Hence, worldwide cigarette consumption per adult has remained approximately constant for the past 20 years, and it is difficult to see how it can be halved over the next 20 years.

Press Release (from 1998)

THREE MILLION TOBACCO DEATHS A YEAR IN CHINA BY MIDDLE OF NEXT CENTURY

CTSU Press Release.

MANY DEVELOPING COUNTRIES FACE SIMILAR EPIDEMIC SAY RESEARCHERS

China is undergoing a catastrophic epidemic of smoking deaths. A third of all its young men will eventually be killed by tobacco if current smoking patterns persist, according to research published Friday 20 November (1998) in the British Medical Journal.

Smoking already kills over 2,000 people every day in China (mostly men). By 2050 this will be well over 8,000. China now has the biggest number of deaths from smoking of any country, having recently overtaken the USA.

Annual smoking deaths in China will be:

- 1 million by around the year 2000
- 2 million around 2025
- 3 million around 2050

Of those killed by tobacco in China:

- 45% die from chronic lung disease
- 15% from lung cancer
- 5-8% from each of oesophagus cancer, stomach cancer, liver cancer, stroke, heart disease and, surprisingly, tuberculosis.
- Of over 300 million males now aged 0-29, at least 100 million will eventually be killed by tobacco. Half the deaths will be at ages 35 to 69.

The findings are from the world's largest-ever investigation into tobacco deaths. Researchers from the Chinese Academies of Preventive Medicine and Medical Sciences collaborated with Oxford University (England) and Cornell University (USA), interviewing a million families of people who had died and a quarter of a million other people. These novel research methods are now being used to monitor smoking hazards in Russia, Poland, Cuba, Mexico, Egypt, India and South Africa.

Results were presented today (19 November) in Beijing and at a British Medical Journal news conference in London.
Professor Richard Peto of Oxford University told the London conference: *"Chinese adults severely underestimate smoking risks. A 1996 nationwide survey showed that two-thirds believe smoking does little or no harm, 60% of Chinese adults don't know that smoking can cause lung cancer and 96% don't know it can cause heart disease. The truth is that half of all persistent smokers get killed by tobacco. As two out of every three young men in China smoke, tobacco will eventually kill about a third of all the young men in China."*

Chinese men smoke far more cigarettes than they used to, but, surprisingly, the smoking changes are opposite for women. Before 1950, 10% of young Chinese women became smokers, but for unknown reasons only 1% do now. However, there is still a danger of a large increase.

Many developing countries will be hit by big epidemics of death from smoking. Worldwide tobacco deaths on current smoking patterns will be:

- 4 million in 2000 - half in rich, half in poor countries
- 10 million by about 2030 - 70% in developing countries

But, big decreases are also possible. Thirty years ago, Britain had the worst smoking death rates in the world. Then people accepted smoking was hazardous and annual cigarette sales in Britain slumped from 150 billion to 80 billion over a thirty year period. Consequently, annual UK tobacco deaths in middle age halved from 80,000 in 1965 to 40,000 in 1995. Britain now has the world's largest decrease in premature deaths from smoking.
Said Prof Peto: *"If worldwide cigarette consumption per adult could be halved by 2020, we'd avoid 25 million deaths from tobacco in the first quarter of the century and 150 million in the second quarter. If smokers quit before they have cancer, or some other serious disease, they avoid most of the risk of death from tobacco. If they don't, there is a 50/50 chance they will die from their habit."*

Notes:

1. Cigarette consumption in China: annual consumption rose from 100 billion in the early 1950s to 500 billion in 1980 and currently stands at 1,800 billion. Average daily cigarette consumption by males was 1 in 1952, 4 in 1972, 10 in 1992.
2. The research was supported by the UK Medical Research Council, a major UK cancer charity(ICRF), the US National Institutes of Health, the Canadian Government and World Bank.
3. A video news release filmed chiefly in China will be available in a version suitable for English-language media, and in an alternative version for Chinese language media.
4. From 19 November, full details will also be available on the CTSU & Globalink websites.
    - CTSU: http://www.ctsu.ox.ac.uk/tobacco/
    - Globalink: http://www.uicc.org/tcpr/

EMERGING TOBACCO HAZARDS IN CHINA - WORLD FIRST STUDY FOR CHINESE SCIENTISTS

RESEARCHERS PREDICT 3 MILLION SMOKING DEATHS A YEAR IN CHINA BY MIDDLE OF NEXT CENTURY AND BIG INCREASES IN MANY OTHER COUNTRIES

Results from the world's largest investigation into tobacco deaths, 'Emerging tobacco hazards in China', are published (Friday 20 November), in the British Medical Journal.

This unique project is a world-first for China, being the first nationwide study of tobacco's effects in a developing country and introducing novel research methods that are rapidly being adopted in many other countries to study tobacco deaths. It has been carried out by researchers from two leading Chinese scientific institutions (Chinese Academy of Preventive Medicine and Chinese Academy of Medical Sciences) in collaboration with researchers from Oxford University, England and Cornell University, USA.

Background

There are two studies - a "retrospective" study of novel design that interviewed the families of one million dead people to find out whether the dead person had smoked, and one ongoing nationally representative prospective study in which a quarter of a million adults were interviewed about their own smoking habits and have been followed for several years to see what they die from. The objective was to assess the hazards at an early phase of the growing epidemic of deaths from tobacco in China and, by continuing the prospective study for another few decades, to monitor the future growth of the epidemic.

The retrospective study compared the smoking habits of 0.7 million adults who had died of cancer, respiratory or vascular causes with those of a "reference group" of 0.2 million adults who had died of other causes (calculating, for example, the excess risk of lung cancer among smokers from the excess of smokers among those who had died from lung cancer). The fieldwork involved over 500 interviewers in 24 major cities and 74 rural counties that are reasonably nationally representative of China.

The prospective study sought out a quarter of a million men aged over 40 from nationally representative disease surveillance points and weighed, measured, interviewed and carried out medical tests on 225,000 (over 85 per cent of the total). Mortality and causes of death have been monitored by annual visits. This prospective study will continue for decades, tracing the growth of the epidemic. Its preliminary results confirm the more detailed findings of the retrospective study.

Countries in Asia, Africa, Eastern Europe and Latin America that are now beginning to use these methods include Russia, Poland, Cuba, Mexico, Egypt, India and South Africa.

The research is a collaboration between the Chinese Academy of Preventive Medicine, Beijing (CAPM), the Chinese Academy of Medical Sciences, Beijing (CAMS), the Clinical Trial Service Unit and Epidemiological Studies Unit (CTSU) at Oxford University, England and Cornell University, Ithaca, New York, USA. It was funded in China by the CAMS, the Ministry of Public Health, the World Bank and the Canadian government, in England by a leading cancer charity (ICRF) and the UK Medical Research Council and in the USA by the National Institutes of Health.

Cigarette consumption in China

Annual Chinese cigarette consumption grew from 100 billion in the early 1950s to 500 billion in 1980 and is now 1,800 billion. One in three of all the cigarettes smoked in the world today are smoked in China.

Average daily consumption per man was one cigarette in 1952, 4 in 1972 and 10 in 1992, but it now appears to have stabilised. The pattern of consumption of Chinese men has been like that in US adults (where average daily consumption per adult was 1 cigarette in 1910, 4 in 1930 and 10 in 1950) except that the main increase has taken place 40 years later. At present, two-thirds of Chinese men (but only 1% of the women) become smokers before the age of 25.

But, although male smoking has increased, female smoking has decreased, for unknown reasons. Before 1950, 10% of young women became tobacco smokers in the cities of China (and many of those who did are now dying from its effects) but nowadays only 1% of young women become smokers.

Findings - the retrospective study

Among male smokers aged 35-69 there was:

- a 51% excess of cancer deaths
- a 31% excess of respiratory deaths

- a 15% excess of vascular deaths

Among male smokers aged 70+ there was:

- a 39% excess of cancer deaths
- a 54% excess of respiratory deaths
- a 6% excess of vascular deaths

Fewer females smoked, but those who did had smoking-attributed risks of lung cancer and respiratory disease about as great as for males.

In some Chinese cities even the non-smokers are at fairly high risk of lung cancer, perhaps because of coal smoke and cooking fumes in the houses, but in other cities lung cancer is rare in non-smokers. For both sexes in all cities, however, the lung cancer rates at ages 35-69 were consistently about three times as great in smokers as in non-smokers and the overall cancer risks among smokers were about 50% greater than for non-smokers.

Likewise, in many areas even the non-smokers are at substantial risk of chronic lung disease, but everywhere the risk is bigger for smokers - indeed, respiratory disease is the most important health hazard from tobacco in China. For stroke and ischaemic heart disease the risk ratios comparing smokers versus non-smokers were not extreme, but it is still likely that the moderate excess of these diseases among smokers is partly or wholly causal as studies in other countries have found a strong relationship between prolonged cigarette use and vascular disease in middle age.

When all diseases were taken into account, the excess risk of death among smokers was greatest for those who started in early adult life.

Of all deaths attributed to tobacco:

- 45% involved chronic obstructive pulmonary disease
- 15% involved lung cancer.
- 5-8% involved each of oesophagus cancer, stomach cancer, liver cancer, stroke, heart disease and, surprisingly, tuberculosis (TB)

The main way that smoking kills people in China is by making diseases that are already common, even more common. For example, among men in urban China those smoking more than 20 cigarettes a day had double the non-smoker TB death rates.
So, in 1990, tobacco caused:

- 0.6 million Chinese deaths (0.8 million in the year 2000)
- 0.3 million deaths at ages 35-69 (0.4 million in the year 2000)
- 12% of male deaths (but increasing)
- 3% of female deaths (probably decreasing)

When the young smokers of today reach old age, tobacco will be causing about:

- 3 million deaths a year
- 33% of male deaths
- 1% of female deaths

As the epidemic evolves, tobacco will kill:

- 1 smoker in 2

Conclusion: Half of those now becoming persistent smokers will eventually be killed by tobacco in middle or old age. Tobacco will kill at least 100 million of the over 300 million males now aged 0-29. Half these deaths will be in middle age and half in old-age.

Findings - the prospective study

In 1990:

- 73% of men smoked (68% urban, 75% rural)
- The overall mortality was greatest among those who started smoking in early adult life
- The excess mortality among smokers chiefly involved cancer, respiratory and vascular disease
- These associations are largely causal, so tobacco currently causes 12% of all male deaths in China
- The overall risk ratio for smokers starting before the age of 20 is already 1.34, implying that even at current death rates about 1 in 4 smokers will be killed by tobacco. But, this risk ratio has already grown much bigger in the cities

and will do likewise in rural areas, as the generations that did not smoke cigarettes regularly are succeeded by the generations that have done so.

- In urban areas, where a greater proportion of tobacco use involves cigarettes, the risk ratio for those who began before age 20 is already approaching 2, suggesting that half of all smokers will be killed by tobacco.

Conclusion: The prospective study and the retrospective study both indicate that in the early 1990s smoking was already responsible for about 12% of all adult male deaths, which currently corresponds to 0.7 million male deaths, plus about 3% (0.1 million) of all adult female deaths. The current health effects, however, chiefly reflect past smoking patterns. On present smoking patterns, the death rates of smokers will become double those of nonsmokers of the same age, suggesting that about half of today's young smokers will eventually be killed by tobacco.

Medical Implications

- Of the Chinese deaths now being caused by tobacco, 45% are from chronic lung disease, 15% from lung cancer and 5-8% from each of oesophagus cancer, stomach cancer, liver cancer, stroke, ischaemic heart disease and tuberculosis.
- Tobacco now causes 12% (and will probably eventually cause about 33%) of adult male deaths, but only 3% (and perhaps eventually only about 1%) of adult female deaths in China: the hazards of tobacco are similar for both sexes, but the proportion of young women who smoke has become very small.
- 2 in 3 males now become smokers before age 25. Few give up, and about half of those who persist will be killed by tobacco in middle or old age. So, on present smoking patterns at least 100 million of the over 300 million Chinese males now aged 0-29 will eventually be killed by tobacco.
- In China, tobacco caused 0.6 million deaths in 1990 and will cause 0.8 million in 2,000 (0.7 million male).On present smoking patterns, annual tobacco deaths will reach 1 million before 2010, 2 million by about 2025 and 3 million (almost all male) when, in the middle of the century, today's young adults reach old age.

Published: Emerging tobacco hazards in China: Part 1, Proportional mortality study of one million deaths. Part 2, Early results from a Chinese national prospective study. British Medical Journal. 21 November 1998.

Questions and Answers about the Study on Emerging Tobacco Hazards in China

Disclaimers:

1. These are studies only of the consequences of the patterns of tobacco use that have been adopted in China, and not of the causes of those patterns.
2. The aim is to give only information, not recommendations, to organisations and individuals.

Q. What was the point of the studies - nearly everyone knows by now that smoking is dangerous?
A. First, most adults in China don't know that smoking is really dangerous: in a nationwide survey two years ago two thirds mistakenly thought that it causes little or no harm. Second, and most important, the results surprised all the experts, including ourselves: the overall dangers of smoking in China were a lot bigger than even we had expected at this relatively early stage of the epidemic and the pattern of diseases caused by smoking was very different from what had been seen in countries like the UK or USA.

Q. What is unique about this new research?
A.

- World's largest study of tobacco deaths
- First nationwide study in any developing country
- New research methodology that lots of other countries are now copying
- Very unexpected pattern of disease from tobacco

Q. Why were the studies carried out in China?
A. China is the world's largest country, with massive cigarette consumption, and with the widespread illusion tobacco might kill lots of Westerners but wouldn't kill many Chinese; and, because even for people who don't smoke, the patterns of disease in China and in the West are very different, nobody really knew what smoking would do.

Q. Where in China was the research carried out and why did you choose these particular areas?
A. 24 enormous cities - Beijing, Shanghai, Wuhan, Guangzhou (= Canton) and 20 others where Professor Liu Boqi could persuade the local doctors that this study would be exciting, plus a set of 74 rural counties all over China where other medical surveys were already being done.

Q. How many people were involved, how much did the studies cost and who paid?
A. 500 interviewers, 100 data coders, 100 doctors on various local committees and over a million families who were interviewed. The total costs paid from outside China were less than 1 million dollars, but inside China many people contributed their time freely.

Q. Why are you carrying out a prospective study when you are already able to predict from the retrospective study the size of the epidemic?
A. Because the prospective study will also, over the next few decades, allow us to monitor the large future growth of the epidemic.

Q. How long will the prospective study go on for and will it be expanded?
A. It should continue for decades, because the epidemic will keep growing for decades, unless lots of people stop smoking. We'd like to expand the prospective study to include women as well and more men, if money becomes available.

Q. Why does the prospective study involve only men?
A. Because the proportion who smoke is much bigger among men than among women, and we didn't have enough money for a full-size study in both men and in women.

Q. Why is the pattern of smoking diseases different in China from that of the West?

A. Because smoking kills people by taking the diseases that are already common in a particular country and making them more common - and, even among nonsmokers, Chinese and Western disease patterns are quite different.

Q. Why does smoking not appear to be linked so strongly to vascular disease in China as it does in the West? And why was there no significant link at all among rural women?
A. We don't know the answer to the first question, but over the next 10 or 20 years we're going to do a lot of extra studies to try to find out. The answer to the second question is that the result among rural women could be a statistical fluke, just because so few of them smoked.

Q. Why is it that Chinese smokers die more from chronic lung disease than lung cancer when the reverse is the case in the West?
A. Because even nonsmokers get lots of chronic lung disease in many parts of China (for reasons we don't understand), and smoking takes that pattern and makes it worse.

Q. Why should heavy smoking double the deaths from TB?
A. Why not? Lots of people who get silently infected with TB manage to keep the infection under control in their lungs for the rest of their lives without ever getting ill from it. Tobacco causes so much lung damage that it could help break down this lifelong balance between disease and defence.

Q. Why, in general, do you think fewer young Chinese women smoke than older women?
A. No idea - we were completely amazed by the decrease in female smoking. But, our study is only of the consequences of smoking, not its causes.

Q. Do you expect the numbers of young Chinese women smoking to increase as it has in the West?
A. Again, no idea - but, if Western cigarette promotion was allowed then it probably wouldn't be difficult to get large number of young women to start smoking, which would eventually cause lots of premature deaths. At present, however, China has laws against that sort of thing.

Q. Is it still possible for Chinese men to avoid the forthcoming epidemic?
A. For the individual who smokes, yes; if they stop before they have some serious disease then they avoid most of their 50/50 risk of being killed by tobacco. For the population as a whole, probably not; if lots of adults gave up over the next 20 years, thereby halving tobacco consumption by 2020, this would avoid "only" about 5 million of the 30 million Chinese tobacco deaths in the first quarter of the century. But, it would avoid about half of the 60 million Chinese tobacco deaths in the second quarter (2025-2050).

Q. If, for example, there was a 10 per cent reduction in male smokers over the next decade, what effect would that have on deaths in the next century?
A. One fifth of the effect of halving it - we'd avoid a million deaths in the first quarter of the century, and about 6 million in the second quarter. You can save a lot more lives by a moderate reduction in a big cause of death than by a big reduction in a small cause.

Q. Is there likely to be a reduction in male cigarette consumption, as there has been among Western males, or are the signs are that consumption will stabilise, or even increase?
A. Cigarette consumption by Chinese men has, at last, stabilised. Obviously what went up could come down, but we don't know whether it will do.

Q. Why are there differences in lung cancer rates between cities even in nonsmokers, if smoking is such an important cause of lung cancer? Does this mean there are other important causes such as domestic air pollution?
A. A lot of the differences between the nonsmoker lung cancer risks in different cities are caused by differences in air pollution inside the houses, probably from coal smoke and cooking fumes (rather than from passive smoking). Outdoor air pollution is probably less important.

Q. Why are there such differences in disease patterns between rural and urban areas and even between one city and another?

A. In general, we don't know. But, as smoking takes existing disease patterns and aggravates them, it means that smoking kills people different ways in different areas.

Q. Why does starting to smoke young (and continuing) particularly increase the risks?
A. Because smoking has to cause more than one change in a normal human cell to make it into the seed of a growing cancer. If people stop before the last such change has happened they will probably be OK.

Q. If starting young is particularly bad, why does vascular disease not seem to be linked with the age of starting?
A. We don't know - but, this question would probably be easier to do research on in Britain or America, where the effects of smoking on heart disease are bigger and hence easier to measure.

Q. Have you any other studies planned on smoking in China?
A. Yes: but the main thing is that we need to make the prospective study bigger and to keep it going for decades.

Q. Are there any lessons here for other developing countries?
A. First, the total hazards from persistent smoking are about as big for the poor as for the rich countries of the world. Second, the chief ways smoking kills people will be very different in different populations - it's heart disease in America, chronic lung disease in China and it could even be TB in India: we won't know until we look.

Q. Would you like to see other developing countries also run similar studies?
A. Yes, and several of them are already doing so.

Q. What health costs is smoking responsible for in China?
A. The World Bank is preparing a report on this which is due out next spring.

Q. Is there any other health issue facing the world today that is more important than tobacco?
A. The only two causes of death in the world that are really big and getting bigger fast are HIV and tobacco.

Q. Which countries, other than China, face the worst deaths from tobacco in the future?
A. The biggest ones. In terms of risk per smoker, however, the worst rates at present are among men in Central and Eastern Europe.

Q. Are there any other countries, apart from Britain, where tobacco deaths are falling?
A. Yes - Finland, for example - but in many countries the better educated people have cut down their smoking substantially, so tobacco deaths are falling among professionals or skilled workers.

Q. What does it mean to claim that smoking is a "cause" of lung cancer?
A. It just means that people who smoke are a lot more likely to get the disease in the near future than otherwise similar people who don't smoke. Of course some smokers don't get lung cancer and some nonsmokers do get lung cancer, but the key point is that many people who get lung cancer wouldn't have done so if they hadn't smoked.

Q. Isn't the probability of death 100% for smokers and nonsmokers alike?
A. Smoking doesn't affect whether you're going to die but it does affect when you're going to die. A young adult who becomes a persistent cigarette smoker more than doubles their risk of dying in middle age - and, on average, smokers who are killed by tobacco in middle age lose 20-25 years of life expectancy, which is a lot. (Overall, about half of all persistent cigarette smokers are killed by tobacco, of whom a quarter are killed at ages 35-69 and a quarter at older ages).

Q. What would you like to see happen as a result of these findings?
A. We'd like doctors, administrators, young people and, above all, adults who already smoke, really to know and understand the real risks - half of all persistent smokers will be killed by tobacco, but if they stop they avoid most of that risk. After that, it's their choice, not ours, what they do with the knowledge.