

Frequently Asked Questions

21st-Century Hazards of Smoking and Benefits of Cessation in the United States

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What does this study reveal that we didn't know before?

Although we have known for decades that smoking is a cause of various diseases, there have been few data available to study the specific effects in American women. Smoking rose and peaked in American women two decades after American men. This study was able to measure the health effects in the women who smoked throughout adult life. Also, earlier studies were done in specific populations such as doctors, nurses or volunteers. The present study is a nationally representative survey in the United States, meaning it looks like a true "snapshot" of all Americans. Finally, this study also monitors the full effects of quitting, which has become common in the US and other Western countries.

Don't we already know that smoking is harmful?

Smoking in men peaked around 1960, but only about 2 decades later in US women. To reliably study the effects of decades of smoking we need modern studies that have enrolled these women and men and are able to monitor a lifetime of smoking. Ours is one of the first studies to establish the 21st century risks of smoking and determine the benefit smokers get from quitting at various ages.

How was the study done? How were the data collected?

The National Health Interview Survey (NHIS) is a large ongoing survey that uses a sampling strategy designed to be representative of the national population, not unlike opinion polls, which try to reach houses in all of the US so that the results reflect the whole of the country. Only the small percentages of people in health care homes, prisons or on military duty are excluded. From each home one adult is selected for an in-depth interview about their smoking and drinking habits, their body weight and height, and other behaviors. A total of about 220,000 adults were included in our study, followed for an average of 7 years.

The National Death Index (NDI) is a registry of all deaths occurring in the US. It was possible to link the NHIS study participants to deaths in the NDI by using their age, social security number, and other identifying details. The Index works well, matching over 95% of people. From these death certificates, we obtained the cause of death, such as lung cancer, stroke, heart attack, etc.

What are the main results of your research?

- **Current smokers have triple the risk for death compared to never smokers**
- **Smoking risks for women and men in the US are now similar**
- **Women have 50% greater risks from smoking than what was last estimated in the 1980s**
- **Never-smokers were about twice as likely as current smokers to survive to 80 years;**
 - o **In females, 70% vs. 38% survival to 80 years; in males 61% vs. 26% survival**
- **At least a decade of life is lost by continuing smoking, compared to never smoking**
- **Cessation before age 30 yields 10 years of life gained, versus continuing smoking**
- **Cessation by age 40, 50 and 60 gains back 9, 6 and 4 years of life, compared to continuing smoking**

If quitting smoking by 40 years of age gives you almost the same life expectancy as someone who never smoked, is smoking not very harmful?

The data show that quitting early in life has a substantially positive impact on your life expectancy versus continuing to smoke. However, even smokers who quit by 40 still have a 20% excess risk of dying before 80 years than those who never started. This is a large risk, but well below the nearly 200% excess risk if they continued to smoke. Thus, its best to quit young, say before age 30, but quitting at any age will have health benefits.

Everyone will eventually die, so what does it mean that smokers have a higher chance of dying than never-smokers?

There are two measures used in this paper for explaining the lifetime risks of smoking: hazard ratios and survival to 80 years. The hazard ratios define how much higher the risks are for smokers than never-smokers after adjusting for the differences between the two groups' age, use of alcohol, education level, adiposity and other factors.

Survival to 80 years draws attention to the chance of premature death due to smoking. We used survival to age 80 as an indicator, as it is now reasonable that the average American adult can live a good and healthy life to this age. Therefore, to examine the lifelong risks of smoking, we compared the chances of smokers and non-smokers reaching age 80.

Our study shows also that today, most non-smokers can expect to reach age 80 (about 70% of non-smoking women and over 60% of non-smoking men). By contrast, very few smokers (either women or men) can expect to reach age 80 years.

Are the people killed by smoking already old?

No. Smoking cuts about 12 years of male life expectancy and 11 years of female life expectancy. This full decade of life is not at old age, but in middle age, taking away good years of life.

How do the US findings relate to results from other countries?

The loss of a decade of life among current smokers has now been documented in studies among Japanese atomic bomb survivors, UK doctors, UK volunteers at female health clinics, and in reviews of various US studies among nurses, doctors and other groups (the last study was also published in this issue of the New England Journal of Medicine). The NHIS is nationally representative, unlike the other studies, so the risks we observe for smoking and the benefits of cessation are thus likely to be true for the whole of the US population.

What are the limitations of this study?

There are several limitations to the study. First, there may be confounding factors other than the variables available in the study dataset. For example, a risk factor other than tobacco use could be the cause of death. The causes of death were, however, from cancer and other diseases that are known to be caused by tobacco use, and analysis of common confounding factors such as education level, alcohol use and adiposity had little effect on the results.

Second, NHIS excludes incarcerated adults, who tend to have increased rates of smoking, but the numbers excluded are small. This would not greatly affect the results we present for the relative risks between smokers and non-smokers, but it may underestimate the overall risks of smoking in the US.

Third, the number of deaths in the NHIS data is lower than those of other studies. Ideally, studies should have tens of thousands of deaths for each major cause. Though the NHIS had a few thousand, it is still a truly representative survey of US death rates and smoking patterns, so this study's results are robust.

Is smoking declining in the US?

Smoking rates peaked around the 1960s for men, and around 1980 for women. Recent trends show declines in some states, but not in others. Overall, the smoking prevalence has fallen little between 2004 and 2010. The 2009 federal excise tax should raise quitting rates.

What would you like to see happen as a result of these findings?

Higher tobacco taxes are the single most effective intervention to reduce smoking and smoking deaths worldwide. In 2009 the US increased federal excise taxes on cigarettes by 53 cents. This measure will save lives, and is a good model for other countries to follow. Increased action on prominent warning labels, advertising restrictions and support for those who want to quit will also raise cessation rates.

Is tobacco use outside of the United States or Canada a problem?

Yes, tobacco is a major global killer. The US has about 40 million smokers and Canada has about 4 million smokers, out of a worldwide total of 1.3 billion. Unlike in the US, quitting in low- or middle-income countries is rare (usually occurring as a result of disease, rather than to avoid disease), and there is weaker implementation of tobacco control policies.

On current trends and without widespread cessation, it is estimated that smoking will kill 1 billion people in the 21st century, mostly in low- and middle-income countries, versus the “only” 100 million deaths in the 20th century due to tobacco.

What is the next step to reduce tobacco deaths?

The most important step is to raise tobacco taxes worldwide, especially as quitting is uncommon in low- and middle-income countries. These countries can learn from the United States that they need not have a decade of life lost among their smokers. Quitting works worldwide.

To quote Professor Amartya Sen, Nobel-Laureate in Economics at Harvard University: *“The inability to develop an appropriate public policy about smoking has been one of the bigger failures of public action in India, China and most other developing countries, in contrast to strong tobacco control in most Western countries. This study brings out how great the threat actually is, and shows that risks of death from smoking are even larger than previously thought. The result is of great global significance.”*