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Smoking, hypertension cause most premature deaths

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NEW YORK (Reuters Health) - Hundreds of thousands of deaths every year in the US could be prevented by tackling just a few risk factors, according to a new study out today in the journal PLoS Medicine.

Dr. Majid Ezzati of Harvard University and colleagues estimated the toll of poor diet, high blood pressure, cigarette smoking, sedentary lifestyle and other factors by determining how 2005 mortality data would change if each were eliminated.

For example, they found, if no one in the US smoked, there would have been 467,000 fewer deaths from smoking-related causes, and if everyone had their blood pressure controlled at optimal levels, 395,000 fewer people would have died.

"Targeting a handful of risk factors has a large potential to reduce mortality in the US, substantially more than the currently estimated 18,000 deaths averted annually by providing universal health insurance," Ezzati and his team say. However, they add, even though there are proven ways to help people quit smoking and reduce their blood pressure, "blood pressure and tobacco smoking declines in the US have stagnated or even reversed."

The researchers gauged the number of preventable deaths by looking at 12 different modifiable risk factors, including overweight and obesity, high salt diets, high blood glucose, high LDL cholesterol, physical inactivity, and low fruit and vegetable intake.

A total of 2.4 million people died in the US in 2005. Smoking and uncontrolled hypertension each accounted for nearly one in five deaths. Cigarettes were the leading killer for men, accounting for 21% of deaths in men. For women, high blood pressure was the leading cause of death, representing 19% of female mortality.

Overweight and obesity accounted for 216,000 deaths and inactivity contributed to 191,000. Among the dietary risk factors, the most lethal were high salt intake (102,000 deaths), low intake of omega-3 fatty acids (84,000 deaths) and high trans fatty acid consumption (82,000).

Alcohol use was a double edged sword; if everyone in the US drank moderately, the researchers say, 26,000 fewer people would die from heart disease or diabetes, but 90,000 more would die from alcohol-related diseases like cirrhosis and pancreatitis or alcohol-related accidents and violence.

Strategies targeting individuals and entire populations could be helpful in reducing the mortality risk factors identified in the study, the researchers say. "Combinations of food industry regulation, pricing and better information can also be effective in reducing exposure to dietary salt and trans fatty acids, especially in packaged foods and prepared meals," they add.

In a press release accompanying the study, Ezzati stated: "The findings should be a reminder that although we have been effective in partially reducing smoking and high blood pressure, we have not completed the task and have a great deal more to do on these major preventable risk factors."

SOURCE: PLoS Medicine, online April 28, 2009.

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Smoking, high blood pressure and being overweight top 3 preventable causes of death in the US

EurekAlert!, April 29, 2009

New study finds hundreds of thousands of deaths each year due to dietary, lifestyle and metabolic risk factors

Smoking, high blood pressure and being overweight are the leading preventable risk factors for premature mortality in the United States, according to a new study led by researchers at the Harvard School of Public Health (HSPH), with collaborators from the University of Toronto and the Institute for Health Metrics and Evaluation at the University of Washington. The researchers found that smoking is responsible for 467,000 premature deaths each year, high blood pressure for 395,000, and being overweight for 216,000. The effects of smoking work out to be about one in five deaths in American adults, while high blood pressure is responsible for one in six deaths.

It is the most comprehensive study yet to look at how diet, lifestyle and metabolic risk factors for chronic disease contribute to mortality in the U.S. The study appears in the April 28, 2009 edition of the open-access journal PLoS Medicine.

"The large magnitude of the numbers for many of these risks made us pause," said Goodarz Danaei, a doctoral student at HSPH and the lead author of the study. "To have hundreds of thousands of premature deaths caused by these modifiable risk factors is shocking and should motivate a serious look at whether our public health system has

sufficient capacity to implement interventions and whether it is currently focusing on the right set of interventions." Majid Ezzati, associate professor of international health at HSPH, is the study's senior author.

The researchers also found large effects from a series of other preventable dietary and lifestyle risk factors. Below are the numbers of deaths in the U.S. due annually to each of the individual risk factors examined:

Smoking: 467,000

High blood pressure: 395,000

Overweight-obesity: 216,000

Inadequate physical activity and inactivity: 191,000

High blood sugar: 190,000

High LDL cholesterol: 113,000

High dietary salt: 102,000

Low dietary omega-3 fatty acids (seafood): 84,000

High dietary trans fatty acids: 82,000

Alcohol use: 64,000 (alcohol use averted a balance of 26,000 deaths from heart disease, stroke and diabetes, because moderate drinking reduces risk of these diseases. But these deaths were outweighed by 90,000 alcohol-related deaths from traffic and other injuries, violence, cancers and a range of other diseases).

Low intake of fruits and vegetables: 58,000

Low dietary poly-unsaturated fatty acids: 15,000

All of the deaths calculated in the study were considered premature or preventable in that the victims would not have died when they did if they had not been subject to the behaviors or activities linked to their deaths. All of these risk factors are modifiable through a range of public health and health system interventions.

While earlier studies had quantified deaths linked to a few factors, like smoking and alcohol, this is the first to look at a wide range of risk factors, including those linked to diet, lifestyle and metabolic factors, and the first to do so for the whole U.S. population. This is also the first to use methods that allowed a true comparison of a diverse set of risks in terms of how many deaths each of the risk factors is responsible for. The researchers analyzed data from a number of public sources, including from the National Center for Health Statistics and numerous published epidemiological studies and clinical trials.

The researchers also found differences between the preventable causes of death among men and women. High blood pressure was the leading cause of death in adult women, killing nearly 230,000 American women each year, 19 percent of all female deaths. By comparison, that is more than five times the 42,000 number of annual deaths in women from breast cancer.

Smoking was the leading cause of death in men, killing an estimated 248,000 annually, or 21 percent of all adult male deaths.

The mortality effects of many other risk factors were about equal in men and women, with alcohol use being a major exception. Seventy percent of all deaths caused by alcohol were among men and represented 45,000 deaths, a result the researchers said was because men consumed more alcohol and engaged in more binge drinking.

"The findings should be a reminder that although we have been effective in partially reducing smoking and high blood pressure, we have not yet completed the task and have a great deal more to do on these major preventable factors," said senior author Ezzati. "The government should also use regulatory, pricing, and health information mechanisms to substantially reduce salt and trans fats in prepared and packaged foods and to support research that can find effective strategies for modifying the other dietary, lifestyle, and metabolic risk factors that cause large numbers of premature deaths in the U.S."

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Goodarz Danaei, Eric L. Ding, Dariush Mozaffarian, Ben Taylor, Jurgen Rehm, Christopher J.L. Murray, Majid Ezzati. The Preventable Causes of Death in the United States: Comparative Risk Assessment of Dietary, Lifestyle, and Metabolic Risk Factors. *PLoS Medicine* 6(4):e1000058. 2009.

Abstract

Background

Knowledge of the number of deaths caused by risk factors is needed for health policy and priority setting. Our aim was to estimate the mortality effects of the following 12 modifiable dietary, lifestyle, and metabolic risk factors in the United States (US) using consistent and comparable methods: high blood glucose, low-density lipoprotein (LDL) cholesterol, and blood pressure; overweight–obesity; high dietary trans fatty acids and salt; low dietary polyunsaturated fatty acids, omega-3 fatty acids (seafood), and fruits and vegetables; physical inactivity; alcohol use; and tobacco smoking.

Methods and Findings

We used data on risk factor exposures in the US population from nationally representative health surveys and disease-specific mortality statistics from the National Center for Health Statistics. We obtained the etiological effects of risk factors on disease-specific mortality, by age, from systematic reviews and meta-analyses of epidemiological studies that had adjusted (i) for major potential confounders, and (ii) where possible for regression dilution bias. We estimated the number of disease-specific deaths attributable to all non-optimal levels of each risk factor exposure, by age and sex. In 2005, tobacco smoking and high blood pressure were responsible for an estimated 467,000 (95% confidence interval [CI] 436,000–500,000) and 395,000 (372,000–414,000) deaths, accounting for about one in five or six deaths in US adults. Overweight–obesity (216,000; 188,000–237,000) and physical inactivity (191,000; 164,000–222,000) were

each responsible for nearly 1 in 10 deaths. High dietary salt (102,000; 97,000–107,000), low dietary omega-3 fatty acids (84,000; 72,000–96,000), and high dietary trans fatty acids (82,000; 63,000–97,000) were the dietary risks with the largest mortality effects. Although 26,000 (23,000–40,000) deaths from ischemic heart disease, ischemic stroke, and diabetes were averted by current alcohol use, they were outweighed by 90,000 (88,000–94,000) deaths from other cardiovascular diseases, cancers, liver cirrhosis, pancreatitis, alcohol use disorders, road traffic and other injuries, and violence.

Conclusions

Smoking and high blood pressure, which both have effective interventions, are responsible for the largest number of deaths in the US. Other dietary, lifestyle, and metabolic risk factors for chronic diseases also cause a substantial number of deaths in the US.

Editors' Summary

Background

A number of modifiable factors are responsible for many premature or preventable deaths. For example, being overweight or obese shortens life expectancy, while half of all long-term tobacco smokers in Western populations will die prematurely from a disease directly related to smoking. Modifiable risk factors fall into three main groups. First, there are lifestyle risk factors. These include tobacco smoking, physical inactivity, and excessive alcohol use (small amounts of alcohol may actually prevent diabetes and some types of heart disease and stroke). Second, there are dietary risk factors such as a high salt intake and a low intake of fruits and vegetables. Finally, there are “metabolic risk factors,” which shorten life expectancy by increasing a person's chances of developing cardiovascular disease (in particular, heart problems and strokes) and diabetes. Metabolic risk factors include having high blood pressure or blood cholesterol and being overweight or obese.

Why Was This Study Done?

It should be possible to reduce preventable deaths by changing modifiable risk factors through introducing public health policies, programs and regulations that reduce exposures to these risk factors. However, it is important to know how many deaths are caused by each risk factor before developing policies and programs that aim to improve a nation's health. Although previous studies have provided some information on the numbers of premature deaths caused by modifiable risk factors, there are two problems with these studies. First, they have not used consistent and comparable methods to estimate the number of deaths attributable to different risk factors. Second, they have rarely considered the effects of dietary and metabolic risk factors. In this new study, the researchers estimate the number of deaths due to 12 different modifiable dietary, lifestyle, and metabolic risk factors for the United States population. They use a method called “comparative risk assessment.” This approach estimates the number of deaths that would

be prevented if current distributions of risk factor exposures were changed to hypothetical optimal distributions.

What Did the Researchers Do and Find?

The researchers extracted data on exposures to these 12 selected risk factors from US national health surveys, and they obtained information on deaths from difference diseases for 2005 from the US National Center for Health Statistics. They used previously published studies to estimate how much each risk factor increases the risk of death from each disease. The researchers then used a mathematical formula to estimate the numbers of deaths caused by each risk factor. Of the 2.5 million US deaths in 2005, they estimate that nearly half a million were associated with tobacco smoking and about 400,000 were associated with high blood pressure. These two risk factors therefore each accounted for about 1 in 5 deaths in US adults. Overweight–obesity and physical inactivity were each responsible for nearly 1 in 10 deaths. Among the dietary factors examined, high dietary salt intake had the largest effect, being responsible for 4% of deaths in adults. Finally, while alcohol use prevented 26,000 deaths from ischemic heart disease, ischemic stroke, and diabetes, the researchers estimate that it caused 90,000 deaths from other types of cardiovascular diseases, other medical conditions, and road traffic accidents and violence.

What Do These Findings Mean?

These findings indicate that smoking and high blood pressure are responsible for the largest number of preventable deaths in the US, but that several other modifiable risk factors also cause many deaths. Although the accuracy of some of the estimates obtained in this study will be affected by the quality of the data used, these findings suggest that targeting a handful of risk factors could greatly reduce premature mortality in the US. The findings might also apply to other countries, although the risk factors responsible for most preventable deaths may vary between countries. Importantly, effective individual-level and population-wide interventions are already available to reduce people's exposure to the two risk factors responsible for most preventable deaths in the US. The researchers also suggest that combinations of regulation, pricing, and education have the potential to reduce the exposure of US residents to other risk factors that are likely to shorten their lives.

<http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000058>