

Four preventable risk factors reduce life expectancy in US and lead to health disparities

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Harvard Public Health Review chart that summarizes the Eight Americas.

A new study led by researchers from the Harvard School of Public Health (HSPH) in collaboration with researchers from the Institute for Health Metrics and Evaluation at the University of Washington estimates that smoking, high blood pressure, elevated blood glucose and overweight and obesity currently reduce life expectancy in the U.S. by 4.9 years in men and 4.1 years in women. It is the first study to look at the effects of those four preventable risk factors on life expectancy in the whole nation.

The researchers also estimated the effects of these risk factors on eight subgroups of the U.S. population, called the "Eight Americas." The Eight Americas are defined by race, county location and the

socioeconomic features of each county. They found that these four risk factors account for a substantial proportion of differentials in life expectancy among these groups. Southern rural blacks had the largest reduction in life expectancy due to these risk factors (6.7 years for men and 5.7 years for women) and Asians the smallest (4.1 years for men and 3.6 years for women).

The study appears in the March 23, 2010 issue of the open-access journal [PLoS Medicine](#).

"This study demonstrates the potential of disease prevention to not only improve health outcomes in the entire nation but also to reduce the enormous disparities in life expectancy that we see in the U.S.," said Majid Ezzati, associate professor of international health at HSPH and senior author of the study.

Smoking, high blood pressure, elevated blood glucose and obesity are responsible for hundreds of thousands of deaths from [chronic diseases](#) such as cardiovascular diseases, cancers and diabetes, in the U.S. each year. By studying how these risk factors affect mortality and life expectancy, public health officials can better address how to improve the nation's health and to reduce health disparities.

For their study, the researchers used 2005 data from the National Center for Health Statistics, the National Health and Nutrition Examination Survey, the Behavioral Risk Factor Surveillance System, and an extensive review of epidemiologic studies on the effects of these factors. They estimated the number of deaths that would have been prevented in 2005 if exposure to the four risk factors had been reduced to their optimal levels or commonly used guidelines. They also assessed the benefits for life expectancy, a measure of longevity.

The Eight Americas were defined by the authors in an earlier study as

Asians; Northland low-income rural whites; middle America; low-income whites in Appalachia and Mississippi Valley; Western Native Americans; Black middle America; high-risk urban blacks and Southern low-income rural blacks.

The researchers found that a person's ethnicity and where they live is a predictor of life expectancy and how healthy a person is. Some of the findings include:

- Asian American men and women had the lowest body mass index (BMI), blood glucose levels and prevalence of smoking
- Blacks, especially those in the rural South, had the highest blood pressure
- Whites had the lowest blood pressure
- Western Native American men and Southern low-income rural black women had the highest BMI
- Western Native American and low-income whites in the Appalachia and Mississippi Valley had the highest prevalence of smoking

As a result of these patterns, smoking, [high blood pressure](#), elevated blood glucose and overweight and obesity account for almost 20% of disparities in life expectancy across the U.S. These four factors also accounted for three quarters of disparities in cardiovascular mortality and up to half of disparities in cancer mortality.

Below is the number of years that would be gained in [life expectancy](#) in the U.S. if each individual risk factor was reduced to its optimal level:

- Blood pressure: 1.5 years (men), 1.6 years (women)
- Obesity (measured by body mass index): 1.3 years (men), 1.3 years (women)
- [Blood glucose](#): 0.5 years (men), 0.3 years (women)
- Smoking: 2.5 years (men), 1.8 years (women)

"It's important that public health policy makers understand that these behavioral and metabolic risk factors are not just personal choices or the responsibility of doctors," said Goodarz Danaei, a postdoctoral research fellow at HSPH and the lead author of the study. "To improve the nation's overall health and reduce [health disparities](#), both population-based and personal interventions that reduce these preventable risk factors must be identified, implemented, and rigorously evaluated."

More information: Danaei G, Rimm EB, Oza S, Kulkarni SC, Murray CJL, et al. (2010) The Promise of Prevention: The Effects of Four Preventable Risk Factors on National Life Expectancy and Life Expectancy Disparities by Race and County in the United States. PLoS Med 7(3): e1000248. [doi:10.1371/journal.pmed.1000248](https://doi.org/10.1371/journal.pmed.1000248)

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