# Using the power of big data to improve health across the US, county by county

Institute for Health Metrics and Evaluation

Our research empowers decision-makers, health professionals, and concerned citizens to assess health problems in their counties and evaluate which programs can most effectively address them.

Interactive map: Female life expectancy at birth, 2010
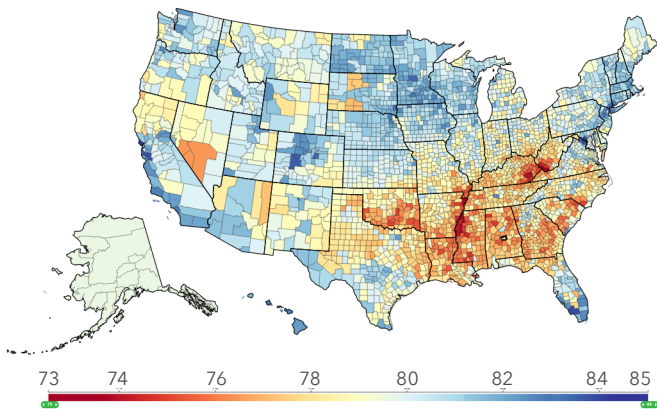
Explore health trends in the US at the county level for both sexes in smoking prevalence, life expectancy, hypertension, obesity, physical activity, and poverty. **vizhub.healthdata.org/us-health-map**

THE UNITED STATES spends more on health care annually than any other nation, yet ranks 36th in the world for life expectancy. Since 2000, life expectancy has been falling behind that of other top nations, particularly for women. There is huge variation across counties, with people in some counties living as long as people in the world's healthiest countries, and people in other counties experiencing life expectancies on par with people in Bangladesh.

Pinpointing the major drivers of poor health at the community level is essential to reversing these trends. Through leading-edge science, big data, and collaboration with experts worldwide, the Institute for Health Metrics and Evaluation (IHME) at the University of Washington provides a comprehensive, detailed picture of counties' pressing health problems.

To improve health, community leaders need information they can act on.

While there's plenty of information about health out there, this information is often messy, incomplete, or not easily comparable.

For instance, in most counties across the US, it's difficult to assess with certainty how much death and disability high blood presure causes in comparison to cancer, how depression compares to violence as a health problem, or how many people die early due to poor diets. Decision-makers need this information to ensure their policies and budgets are well aligned with communities' needs Also, the gap in life expectancy between the healthiest and sickest counties is increasing, and women in 72 counties are living shorter lives than their mothers. No one knows why. Identifying the keys to the healthiest counties' success can inspire other counties to follow in their footsteps and give business leaders the insight they need to fund programs that boost the health of their workforce.

How does IHME provide useful information?

We leverage all available data from counties, ranging from survey and census data to death records and deidentified patient records. We have amassed one of the largest repositories of population-level health data in the world. We have developed — and are constantly revising — sophisticated statistical methods to make sense of those data. We make accurate, "apples to apples" comparisons about health between counties, across ages, and over time. We make these data available to the public through interactive data visualization tools, policy reports, and infographics.

As we search for answers, we educate.

IHME trains students, fellows, policymakers, and health workers to conduct data collection and evaluation. We aim to raise the bar for health measurement in the US and around the globe by making sure that more people understand — even contribute to — the collection and evaluation of data.

There's growing demand for locally relevant data; other countries are soliciting our help.

The governments of countries such as Australia, the United Kingdom, and Mexico are working with us to measure and monitor the health of their populations. In Australia, IHME is collaborating with government researchers to assess health disparities between Australian Aboriginals and Torres Strait Islanders compared to the rest of the population and to examine the impact of antismoking campaigns aimed at reducing these disparities. The governments of the UK and Mexico are working with IHME to investigate how health outcomes differ across localities and will use the data to tailor interventions to the unique needs of each community.

UNIVERSITY *of* WASHINGTON

Initiatives and Impact

Investigating health successes and challenges in US counties

IHME is working with officials from selected counties to identify what's driving disparities between the healthiest and sickest counties in the US. Researchers seek to understand, for example, how differences in eating habits, income, education, smoking, and access to health care may explain why people in some counties live so much longer than they do in others.

King County burden of disease study

IHME is conducting a King County, Washington, burden of disease study, using all available data to provide an in-depth look at health outcomes across different age groups, genders, and communities. We are collaborating with Public Health – Seattle & King County to ensure that the results are widely disseminated, understood, and used by local decision-makers. To foster community engagement and ensure accessibility of the data, IHME will make the study's findings publicly available in an easy-to-use data visualization tool.

First Lady Michelle Obama encourages public health officials to use IHME's research for US counties.

Michelle Obama uses IHME research to promote better nutrition

As part of her *Let's Move!* campaign, First Lady Michelle Obama invited mayors and other local government officials to the White House to hear IHME Director Christopher Murray discuss the different factors that cut lives short and cause suffering in the US. Mrs. Obama said "[This research] makes clear that poor nutrition is the single-greatest cause of preventable diseases and ailments in this country – the single-greatest cause."

New York Times investigates widening gap in smoking habits of the rich and poor

In the article "Smoking Proves Hard to Shake Among the Poor," the *New York Times'* Sabrina Tavernise and Robert Geberoff used IHME's data to explore how poor counties are falling behind rich counties when it comes to reducing smoking, especially in women.

Washington Post reports that childbirth is now more hazardous in the US than in China

"A woman giving birth in America is now more likely to die than a woman giving birth in China, according to a new study," declared a May 2014 *Washington Post* article. The reporters used IHME data to investigate possible explanations for the "steep rise" in maternal deaths in the US since 1987, such as an increase in the number of pregnant women with chronic diseases leading to a rise in high-risk pregnancies.

Vitality Institute uses IHME data to promote prevention

The Vitality Institute included IHME's data on obesity, physical activity, and smoking across US counties in its report, *Investing in Prevention: A National Imperative.* Launched at an event featuring speakers from the Robert Wood Johnson Foundation, Johnson & Johnson, and other prominent private participants in US health, the report focuses on ways that private actors, the public sector, and communities can help people live longer and healthier lives.

Christopher Murray, MD, DPhil
Director of IHME, University of Washington Professor of Global Health

As a physician, economist, and expert in health metrics and evaluation, Dr. Christopher Murray founded the Global Burden of Disease approach and was the lead author of the first GBD report in 1993. He has held leadership roles at the World Health Organization and the Harvard School of Public Health.

About IHME

The Bill & Melinda Gates Foundation funded IHME at the University of Washington in 2007. Under the leadership of Christopher J.L. Murray, MD, DPhil, researchers began gathering rigorous, scientific evidence on health in countries worldwide to launch a new era of independent, objective assessments.

Transform Health

The United States invested more than $2 trillion in health in 2013, but relatively little is known about what types of investments are most effective in reducing death and suffering. IHME is devoted to building this knowledge base. Through our research, we empower decision-makers, health professionals, and concerned citizens to assess health problems in their counties and evaluate which types of programs can most effectively address them.

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