Eight Americas: Investigating Mortality Disparities across Races, Counties, and Race-Counties in the United States

Christopher J.L. Murray, MD, DPhil
Institute Director, Institute for Health Metrics and Evaluation
Professor of Global Health, University of Washington

Majid Ezzati, Ph.D.
Associate Professor
Harvard School of Public Health
OUTLINE

US County Patterns of Mortality

Defining Eight Americas

8 Americas: Mortality and Causes of Death

8 Americas: Risk Factors

Country trends in life expectancy

Policy Focus
US County Life-Table Methods

- 2074 merged counties to ensure 10,000 males and females in 1990 in each county, and to ensure consistency of county definition and mortality statistics over time
- 5-year moving average death rates
- Census data: 1960-2000
- Death files: 1959-2001
County life expectancy 1997-2001

Males

Females
Width of Cross-County Distribution of Life Expectancy

Institute for Health Metrics and Evaluation
Life Expectancy for Top and Bottom 2.5% of Counties

Male

- Top 2.5%
- Bottom 2.5%

Female

- Top 2.5%
- Bottom 2.5%

Institute for Health Metrics and Evaluation
Summary of County Life Expectancy Patterns

- Male life expectancy rising faster than female life expectancy
- Best counties have life expectancies higher than the country with the highest life expectancy (Japan)
- Worst counties demonstrate little or no progress in 20 years
- Gap between best and worst is widening
Races, Counties and Race-Counties

Where there is sufficient person-years of observation, we compute life expectancy for each race group in each county.

Even larger variation in life expectancy across race-counties ranging from life expectancy of 58 for Native American men in a cluster of counties in Southwest South Dakota to 91 for Asian women in Bergen county, New Jersey.
OUTLINE

US County Patterns of Mortality
Defining Eight Americas
8 Americas: Mortality and Causes of Death
8 Americas: Risk Factors
Country trends in life expectancy
Policy Focus
Analytical objective

Identify sub-populations making up the US population with distinct socio-demographic and geographical characteristics that capture the range of mortality experiences across counties and races.

No unique way to do this – chose 8 sub-groups.
Definitions of the Eight Americas

• America 1: Asians living in counties where Pacific Islanders < 40% of population
• America 2: White low-income rural Northland
• America 3: Middle America
• America 4: White poor Appalachia and Mississippi Valley
• America 5: Western Native Americans
• America 6: Black middle America
• America 7: Black poor rural south
• America 8: Black high-risk urban
OUTLINE

US County Patterns of Mortality
Defining Eight Americas

8 Americas: Mortality and Causes of Death
8 Americas: Risk Factors
Country trends in life expectancy
Policy Focus
Life Expectancy at Birth in the Eight Americas

Males

Females

Male Causes of Death in the Eight Americas Compared to Japan, UK, Russia and West Africa

HIV/AIDS
Intentional injuries
Unintentional injuries
Other Non-communicable diseases
Other Communicable diseases
Cardiovascular diseases
Cancers

0 - 4 years 15 - 44 years 45 - 64 years 65 - 74 years 75 - 84 years

Mortality in the Eight Americas by Age Compared to Other High-Income Countries

Murray et al. AJPM 2005
OUTLINE

US County Patterns of Mortality
Defining Eight Americas
8 Americas: Mortality and Causes of Death
8 Americas: Risk Factors
Country trends in life expectancy
Policy Focus
Risk Factor Data Sources in the US

• National Health and Nutrition Examination Survey (NHANES)
  – In-person interview and measured tests
  – Only nationally representative
  – Traditionally not annual

• Behavioral Risk Factor Surveillance System (BRFSS)
  – Telephone survey
  – State-representative
  – Annual
Difficult to Explain Disparities Between 8 Americas on the Basis of Reported Healthcare Access.
Self-Reported Utilization of Basic Primary Care Not Correlated with 8 Americas Disparities
Disease Burden Attributable to Leading Risks (WHO North America Region)

Institute for Health Metrics and Evaluation

Self-Reported Smoking

Alcohol: Average Number of Drinks Per Day

Institute for Health Metrics and Evaluation
Obesity Corrected for Self-Report Bias

![Bar chart showing obesity rates corrected for self-report bias in America, with bars for Male and Female populations across different regions.](chart.png)
Uncontrolled Hypertension

Institute for Health Metrics and Evaluation

America

Male
Female

0%
5%
10%
15%
20%
25%
30%
35%

1 2 3 4 5 6 7 8
Blood Sugar

America

Mean FPG

Male
Female

Institute for Health Metrics and Evaluation
Risk Factor Patterns

• Of major noncommunicable disease risk factors, obesity, blood sugar, hypertension strongly correlated with 8 Americas disparities.

• No data on cholesterol – but this may also be closely related.

• Further analytical work needed to determine how much of the gaps between the 8 Americas would be narrowed by addressing these key risks.
OUTLINE

US County Patterns of Mortality
Defining Eight Americas
8 Americas: Mortality and Causes of Death
8 Americas: Risk Factors

Country trends in life expectancy
Policy Focus
Change in Male Life Expectancy 1961-1983

US County Areas

- **1** - Sig. > national change (4.103195190429688)
- **2** - Sig. > 0 but not sig. > 4.103195190429688
- **3** - Sig. < 4.103195190429688 and sig. > 0
- **4** - Not sig. different from 0 nor 4.103195190429688
- **5** - Sig. < 4.103195190429688 but not sig. > 0
- **6** -
Change in Female Life Expectancy 1961-1983

Institute for Health Metrics and Evaluation
Change in Male Life Expectancy 1983-1999
Change in Female Life Expectancy 1983-1999
Institute for Health Metrics and Evaluation

Figure 4

<table>
<thead>
<tr>
<th>Year Interval</th>
<th>Male Change in Probability of Death</th>
<th>Female Change in Probability of Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-1983</td>
<td>-0.20</td>
<td>-0.05</td>
</tr>
<tr>
<td>1983-1999</td>
<td>0.10</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Legend:
- Intentional injuries
- Unintentional injuries
- HIV/AIDS
- Other Communicable diseases
- Lung Cancer
- Other Cancers
- COPD
- Diabetes
- Cardiovascular
- Other Non-communicable diseases
Female Life Expectancy Falling in Some Counties

• Sub-group of US counties where female life expectancy is falling.

• Outside of the former Soviet Union and the hardest hit by the HIV epidemic in Sub-Saharan Africa, unique development.

• Not only is there no progress in reducing disparities but a combination factors leading to actual reductions in life expectancy in some communities.
OUTLINE

US County Patterns of Mortality
Defining Eight Americas
8 Americas: Mortality and Causes of Death
8 Americas: Risk Factors
Country trends in life expectancy
Policy Focus
Going Beyond the Health Insurance Debate

Most US health policy is dominated by the lack of health insurance for significant sub-segment of the population.

Increasing health insurance access would likely have immediate benefits of reducing catastrophic health payments and eventually improving some health outcomes.

Universal health insurance alone is unlikely to reduce substantially the gaps across the 8 Americas or address the decline in absolute and relative terms of the health of the Americans at the bottom
Focus on Key Drivers of Non-Communicable Diseases

Concerted effort to address through changes in diet, physical activity, tobacco and alcohol and through primary care management of risks like blood pressure, blood sugar and cholesterol is needed.

Financial access such as lack of insurance is only one factor influencing the impact of behavioural change programs and the effective coverage of interventions for blood pressure, cholesterol and blood sugar.
Local Innovation, Monitoring, Evaluation and Shared Learning

Addressing the key drivers of the disparities between the 8 Americas will likely require tailoring solutions to local circumstances.

The policy response should be to foster innovative programs for risk factor change and use of effective therapies for key risks.

Local innovation should be accompanied by rigorous monitoring and evaluation of population health impact and shared learning of what works and what does not.
Not Just Reducing Disparities

Addressing disparities will help Americans in Americas 4, 5, 6, 7 and 8 in particular.

The rank of the US in terms of infant mortality, child mortality, adult mortality and life expectancy continues to drop for the country as a whole.

The US is falling behind the rest of the high-income world.

It seems likely that the same factors that account for the huge and growing disparities in the US may also explain the relative slowdown of US health even for Americas 1, 2 and 3.