The Impact of Education on Mortality
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Understanding the Relationship Between
Years of Education and Longevity

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“Science in pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life and reduce illness and disability.”
The health of the nation: poor value for money

Figure 1. There are large differences in life expectancy and health care spending across OECD countries 2008

1. Or latest year available.
Source: OECD Health Data 2010.
17 Peer Comparison Countries

- Australia
- Austria
- Canada
- Denmark
- Finland
- France
- Germany
- Italy
- Japan
- Norway
- Portugal
- Spain
- Sweden
- Switzerland
- The Netherlands
- United Kingdom
- United States
Life Expectancy at Birth in 21 High-Income Countries, 1980-2006

From IOM/NAS Report US Health in International Perspective: Shorter Lives, Poorer Health

The problem is longstanding and worsening. In 1980, US life expectancy among females was about average, and was near the bottom for males, but by 2006 US life expectancy for both sexes had fallen to the bottom ranks.
• US male and female newborns can expect to lose about 1.4 years and 0.8 years of life, respectively, before age 50.
• The US losses before age 50 are double those of Sweden, the best performing country.
For decades, American youth have been less likely to survive to age 50 than people in other rich nations.
Educational Attainment in the US is Slipping

- US preschool enrollment is lower than in most high-income countries.
- Among adults of all ages, the US ranks well in educational attainment, but other countries (including emerging economies) are outpacing the US in the educational attainment of young people (e.g., graduation rates).
- US grade school students score above average, but by age 15 US students have average or below-average scores on math, science, and reading.
Change In Female Mortality Rates From 1992–96 To 2002–06 In US Counties.

Educational attainment strongest correlate


Substantial improvement
Minimal improvement
Worsening

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With State as Unit of Analysis, Life Expectancy Health Disparities Are Highly Correlated with 4th Grade Math Performance Disparities (from Kaplan 2013)

Relationship Between Education Disparity and Life Expectancy Disparity by State

\[ y = 0.211x + 1.2712 \]
\[ R^2 = 0.6246 \]
US Female Population, By Race And Years Of Education At Age 25, 2008.

Olshansky S J et al. Health Aff 2012;31:1803-1813

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Life Expectancy At Birth, By Years Of Education At Age 25 For White Females,

Olshansky S J et al. Health Aff 2012;31:1803-1813

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Hazard of premature death by years of education

Hazard of Death 1997-2002

Adapted from Rogers et al Biodemography and Social Biology, 56:80–99, 2010
Figure 1. Log-odds coefficients of the risk of adult mortality by educational attainment, Non-Hispanic Whites 1986-2006 (optimal functional form)

From Mark Hayward, University of Texas
Figure 2: Log-odds coefficients of the risk of adult mortality by educational attainment, Non-Hispanic Blacks 1986-2006 (optimal functional form) (from Mark Hayward)
Education and Longevity in the REGARDS Study With Adjustments (Kaplan & Howard, et al 2015)

- Collage Grad or more: 1.38, p<0.0001
- some college: 1.26, p<0.0001
- high school grad: 1.13, p<0.0001
- less than HS: 1.08, p<0.0001
- behavioral: 1.06, p<0.0001
Education and Longevity in the REGARDS Study (Kaplan & Howard et al Annals of Epidemiology, 2015)
Education and health: It may be related to behaviors

Education and Health: Is it Access to Care? (Kaplan et al 2015: MEPS 2013 data)

**Fig 1c** Percent with activity limitations

**Fig 1D** Office Visits
Quality-Adjusted Life Years By Risk Group

- Yearly vs 3rd year Pap Smears
- Mammography vs Not Screened
- Normal vs LDLC > 160
- S Blood pressure > 140 vs 120
- Smoking 30 years vs never
- Advanced Degree vs < HS

Data estimated from Whitehall 39 year follow-up: Clarke BMJ 2009;339:b3513
Deaths Associated With Low Education In Perspective

Deaths in 1,000s

- <High School Education
- Stroke
- Alzheimer's Disease
- Diabetes Mellitus
- Suicide
- Motor Vehicle
- Homicide

What is the return on $2.9 trillion?

Adapted from Rick Brush, Collective Health
What Makes us Healthy?

Health Care 10%  
Health Behaviors 50%  
Other Factors 40%

Adapted from Rick Brush, Collective Health
What We Spend on Being Healthy

Health Spending

97% Health Care

3% Factors outside of the health care system

Adapted from Rick Brush, Collective Health
Health Spending

97% Health Care

3% (Health Behaviors & Other Factors)

10% Health Determinants

90%

Adapted from Rick Brush, Collective Health
Scatterplot of relationship between increases in % with college degree and increase in life expectancy 1970-2010: OECD data
"Somebody has to do something, and it's just incredibly pathetic that it has to be us."
Thanks for Participating
Let's Start the Discussion