

DO RECENT DECLINES IN U.S. LIFE EXPECTANCY MEAN BAD NEWS FOR HEALTHY LIFE EXPECTANCY?

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First Rise in U.S. Death Rate in Years Surprises Experts

By **SABRINA TAVERNISE** LAST UPDATED: MAY 31, 2016

WASHINGTON — The death rate in the United States rose last year for the first time in a decade, [preliminary federal data show](#), a rare increase that was driven in part by more people dying from drug overdoses, suicide and Alzheimer's disease. The death rate from heart disease, long in decline, edged up slightly.

Death rates — measured as the number of deaths per 100,000 people — have been declining for years, an effect of improvements in health, disease management and medical technology.



Paramedics in Portland, Me., responded to a call of a heroin overdose last year. DEREK DAVIS/PORTLAND PRESS HERALD, VIA GETTY IMAGES

What's killing white middle-aged American women?

11 May 2016 | US & Canada



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The rich world has got used to health and longevity getting better, and death rates falling for everyone.

But over the past few years, data has been accumulating which suggests that this trend has stopped for poorly-educated, white Americans.

And for one group in particular - middle-aged women - death rates are going up.

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White Women Are Dying Prematurely

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As America's white underclass copes with the problems that have long burdened black America, the conversation around poverty is changing.



Photo by arileu

By Kali Holloway / AlterNet

Some of the consequences of white America's opiate epidemic—a topic that has been widely explored by media outlets and social scientists—are still coming to light. Opioid use and addiction have exploded in predominantly white communities around the

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More White People Die From Suicide and Substance Abuse: Why?

By GINA KOLATA

The big mystery is why? Why would the death rate for middle-aged non-Hispanic whites be increasing after decades of decline while rates for middle-aged blacks and Hispanics continue to fall? And why didn't other rich countries have the same mortality rate increase for people in midlife?

The two Princeton economics professors — Angus Deaton and his wife, Anne Case — who wrote the report that is the subject of my [front-page article today about rising death rates for middle-aged white Americans](#), have no clear answer, only speculation. But the effect is stark. Dr. Deaton and Dr. Case calculate that if the death rate among middle-aged whites had continued to decline at the rate it fell between 1979 and 1998, half a million deaths would have been avoided over the years from 1999 through 2013. That, they note, is about the same



Angus Deaton with his wife, Anne Case, right, last month after he won the 2015 Nobel Memorial Prize in Economic Science. Together, they wrote a study analyzing mortality rates. BEN SOLOMON FOR THE NEW YORK TIMES

Headline news almost catches up with research

- Widening educational gradients in mortality in the U.S. for decades
- Recent evidence that widening reflects both *vast improvements* in mortality for persons with advanced education and *worsening* mortality for persons with less than high school
 - Montez et al (2011, *Research on Aging*)
 - Olshansky et al (2011, *Health Affairs*)
 - Masters et al (2012, *American Sociological Review*)
 - Miech et al (2012, *American Sociological Review*)
 - Hayward, Hummer and Sasson (2015, *Social Science & Medicine*)
 - Case and Deaton (2015, *PNAS*)
 - Bound et al (2015, *Health Affairs*)
 - Sasson (2016, *Demography*)

Life expectancy at age 25 by race, sex, and educational attainment, U.S. 1990-2010 (Sasson 2016)

Education	White Female			White Male		
	1990	2000	2010	1990	2000	2010
0-11	54.0	51.5	50.9	46.0	45.2	45.4
12	55.1	55.6	55.9	48.7	50.0	50.5
13-15	55.2	56.0	56.7	49.7	52.3	52.8
16+	56.5	58.7	60.2	52.1	54.9	57.3
Total	55.4	55.8	56.9	49.3	51.1	52.5

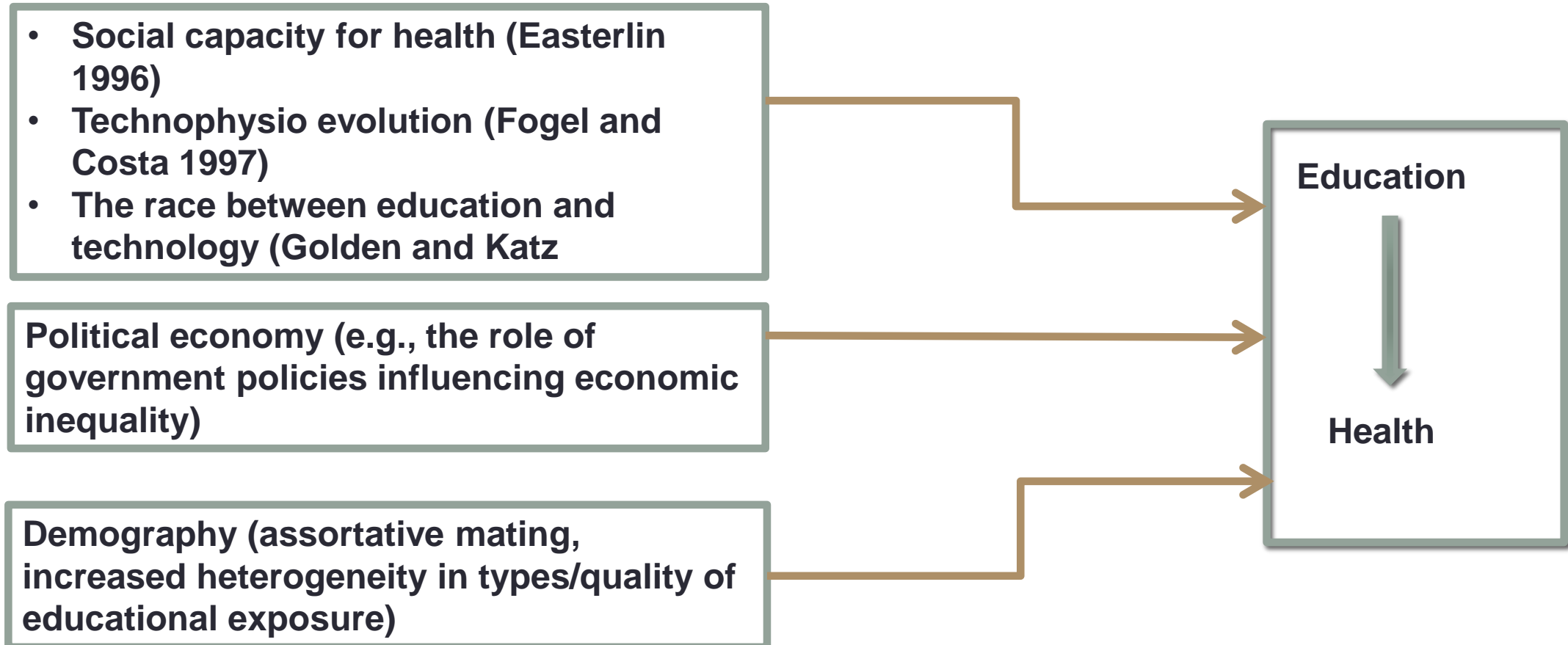
Education	Black Female			Black Male		
	1990	2000	2010	1990	2000	2010
0-11	49.9	49.5	51.8	39.6	42.2	45.5
12	49.2	50.4	52.7	41.4	43.9	46.5
13-15	49.6	51.6	54.2	43.1	48.6	50.9
16+	51.8	54.5	56.5	46.5	50.4	54.1
Total	50.8	51.6	54.0	42.2	45.3	48.5

* Excluding whites and blacks of Hispanic origin.

What implications do these mortality trends for healthy life expectancy?

- Is the declining life expectancy among less educated Americans just a tip of the iceberg?
 - Declining healthy life expectancy?
- Does the rapidly improving life expectancy among the best educated Americans point to improvements in underlying health?
 - Improving healthy life expectancy?
- Because mortality changes have occurred differentially across age groups, it is particularly important to identify where in the age range gains and losses in HLE occur within major educational groups
- What are the relative contributions of changes in mortality and disability to the overall changes in HLE?

Societal level forces contribute to changes in the association between educational attainment and health



Data

Age-specific mortality rates

- Vital registry – multiple Cause of Death public use data files from 2000 & 2010 (2,012,608 and 2,050,109 deaths respectively)
- Population estimates by education – U.S. Census 5% Integrated Public Use Microdata Sample (2000) and American Community Survey (2010)
- Bayesian imputation of missing data on educational attainment in the vital registry

Disability prevalence rates

- Health and Retirement Study (using cross-sectional weights in 2000 & 2010)
- Representative of non-institutionalized Americans aged 50 and over
- Focus on non-Hispanic whites and blacks by gender

Key Measures

Educational attainment by years of schooling

- Less than high-school (0-11)
- High school (12)
- Some college (13-15)
- College and higher (16+)

Disability

- At least one ADL, no ADL but IADL
- Age-specific rates smoothed using logistic regression by age, race, gender, and education

Healthy/Unhealthy life expectancy estimated using Sullivan's Method
Multistate life tables

Health Questions, Health and Retirement Study

Activities of Daily Living (ADLs)

- Because of a health problem do you have any difficulty:
 - Bathing
 - Getting Dressed
 - Eating
 - Getting Out of Bed
 - Walking Across the room

Instrumental Activities of Daily Living (IADLs)

- Because of a health or mental condition do you have difficulty
 - Using a map
 - Preparing a meal
 - Making a phone call
 - Taking Medication
 - Managing Money

If the respondent indicated that they had difficulty or could not do *any* of the activities they were coded as having a limitation

Decomposition of change in healthy life expectancy

- REVES team extension of the Arriaga decomposition method to a Sullivan life table
- Allows for mortality vs. disability effects by age group
- http://www.eurohex.eu/pdf/Reports_2010/2010TR7.1_Decomposition%20tools.pdf

Table 1: Weighted Descriptive Statistics, 2000 and 2010 Health and Retirement Survey

	2000				2010			
	Non-Hispanic Whites		Non-Hispanic Blacks		Non-Hispanic Whites		Non-Hispanic Blacks	
	Males	Females	Males	Females	Males	Females	Males	Females
Age (Average)	64.8	66.4	64.0	65.0	64.2	65.5	61.8	63.1
% Over 70	30.9%	37.7%	25.7%	30.9%	27.8%	32.7%	17.4%	22.4%
Educational Attainment								
Less than High School (LTHS)	24.7%	23.8%	48.4%	45.4%	16.0%	15.8%	31.5%	29.2%
High School (HS)	27.8%	37.1%	25.2%	26.8%	25.9%	31.9%	25.7%	23.9%
Some College (SC)	19.8%	22.4%	16.3%	16.0%	25.3%	26.6%	27.2%	29.1%
College degree or more (C+)	27.6%	16.7%	10.1%	11.8%	32.9%	25.7%	15.6%	17.7%
Health Condition or Limitation								
ADL	10.2%	10.6%	15.4%	25.1%	13.9%	14.6%	20.1%	24.2%
IADL	8.0%	14.1%	13.7%	21.1%	11.4%	13.7%	18.7%	22.5%
CVD	25.9%	19.4%	23.7%	22.4%	28.4%	23.1%	23.5%	28.0%
N	6,823	9,067	993	1,674	6,893	8,830	1,626	2,490

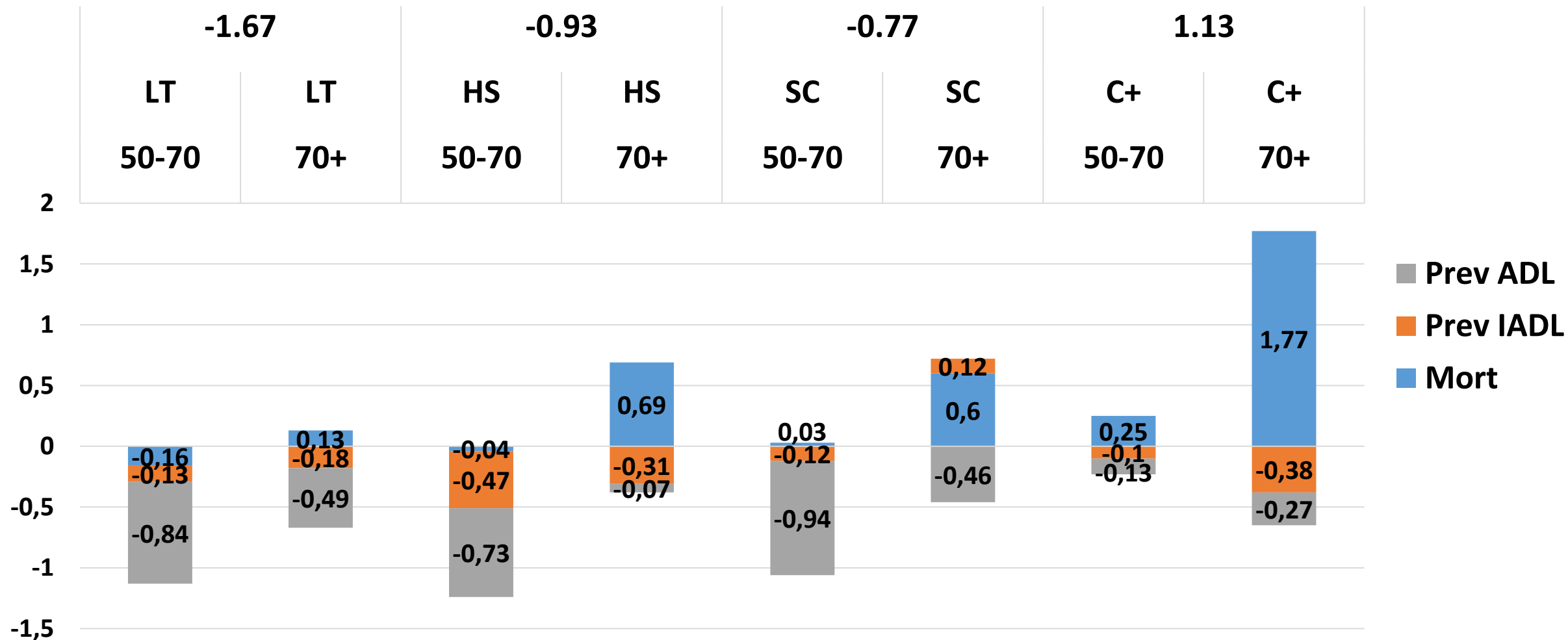
Source: Health and Retirement Survey

**Table 2: Change in Healthy Life Expectancy
(ADL & IADL Combined) at age 50, Non-
Hispanic White Men, 2000-2010**

		Year		
		2000	2010	Change
LTHS	TLE	24.88	24.89	0.01
	HLE	18.07	16.40	-1.67
	DLE	6.81	8.50	1.68
HS	TLE	27.51	28.43	0.91
	HLE	23.26	22.33	-0.93
	DLE	4.25	6.09	1.84
SC	TLE	28.89	29.75	0.86
	HLE	24.40	23.64	-0.77
	DLE	4.48	6.11	1.63
C+	TLE	30.84	33.48	2.64
	HLE	27.55	28.68	1.13
	DLE	3.29	4.80	1.51

Source: HRS Waves 5 & 10 - U.S. Vital Statistics
HLE and DLE may not add to TLE due to rounding

**Figure 1: Decomposition of Change in Healthy Life Expectancy at age 50
(ADL+IADL) White Males, 2000-2010**

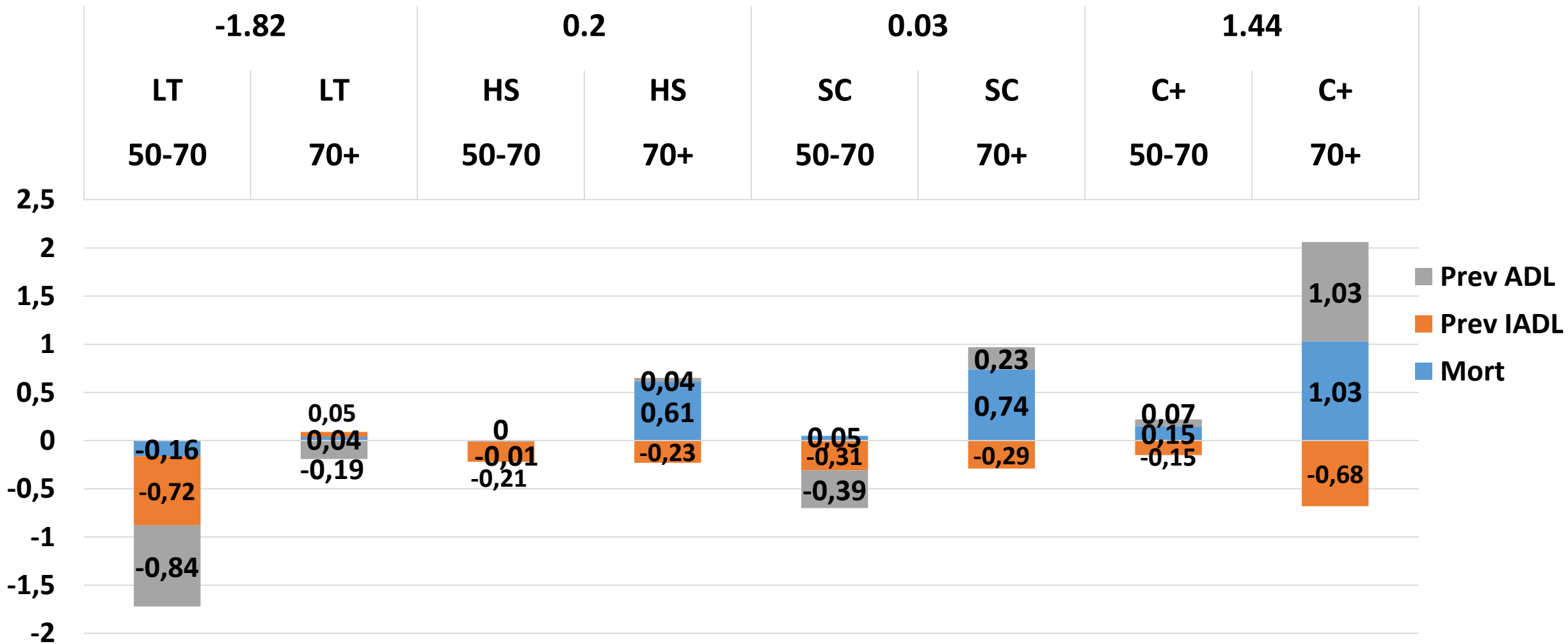


**Table 3: Change in Healthy Life Expectancy
(ADL & IADL Combined) at age 50, Non
Hispanic White Women, 2000-2010**

		Year		
		2000	2010	Change
LTHS	TLE	29.54	29.42	-0.11
	HLE	20.45	18.63	-1.82
	DLE	9.08	10.80	1.71
HS	TLE	31.93	32.88	0.95
	HLE	26.12	26.31	0.20
	DLE	5.81	6.56	0.75
SC	TLE	31.95	33.09	1.14
	HLE	26.42	26.44	0.03
	DLE	5.54	6.65	1.11
C+	TLE	34.42	36.13	1.71
	HLE	28.47	29.91	1.44
	DLE	5.95	6.22	0.27

Source: HRS Waves 5 & 10 - U.S. Vital Statistics
HLE and DLE may not add to TLE due to rounding

Figure 3: Decomposition of Change in Healthy Life Expectancy at age 50 (ADL+IADL), White Non-Hispanic Females, 2000-2010



Do recent declines in U.S. life expectancy mean bad news for healthy life expectancy?

- The downward/stable $e(x)$ trend in the US is concentrated at the bottom end of the education distribution for whites and at ages prior to age 65
- Here, little change in TLE for men and women with LTHS, but substantial gains in DFLE and losses in HLE
 - Much of the decline in HLE reflected increased disability before age 70
 - The rise in ADL disability especially contributed to the decline in HLE
- Among the college educated, life expectancy increased substantially the decade, especially among males
 - HLE also increased over the decade, with much of the increase from declining mortality after age 70
 - Much of the improvement in HLE from mortality was offset by a rise in IADL disability
- As education increases, the factors influencing HLE shift from younger ages to advanced ages

Final thoughts

- The pace of technological change throughout American society is outstripping stalled educational achievement in the U.S.
 - Growing socioeconomic segregation of life course exposures to risks and rewards
- This contributes to the rapid expansion of inequality in mortality and health in the US – with pernicious consequences for people at the low end and extraordinary benefits for people with advanced education
- Most of the trend is likely to reflect differences in cohort life course exposures and health consequences
- Pessimistic view of inequality in healthy life expectancy in the near future, with perhaps a decline in healthy life expectancy for those at the low end of the socioeconomic ladder