

Precarious employment and public health in Appalachia

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Question #1

In high income countries, what employment status is the greatest source of overall mortality and morbidity to the population as a whole?

Outline

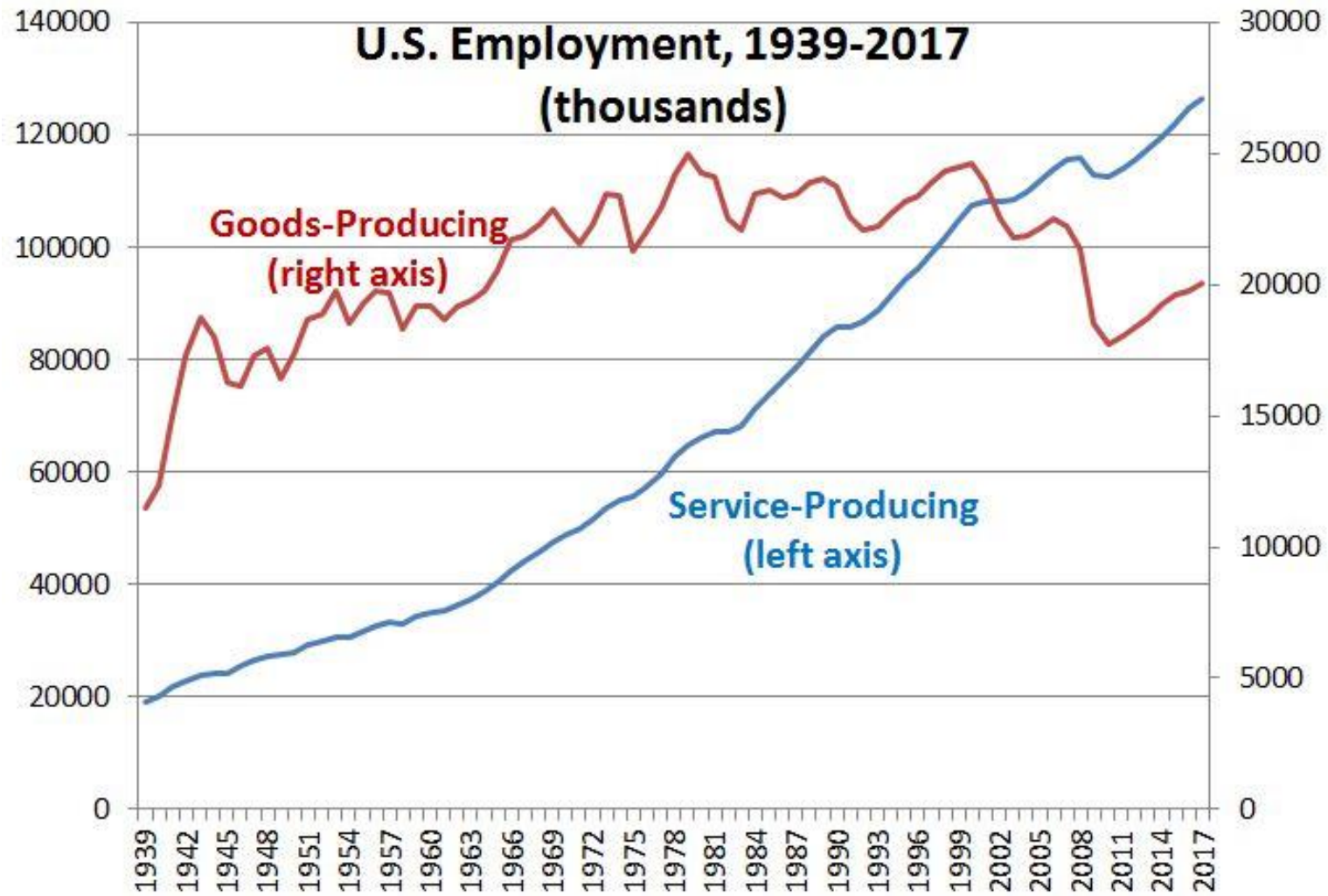
- Brief introduction to the Appalachian region
- Precarious employment in Appalachia
- Our research
- Broader public health implications

Appalachian Region

- 25.7 million people (2019)
- Rural
- Extractive industries (salt, timber, coal, natural gas)
- Heavy manufacture (chemicals, steel)

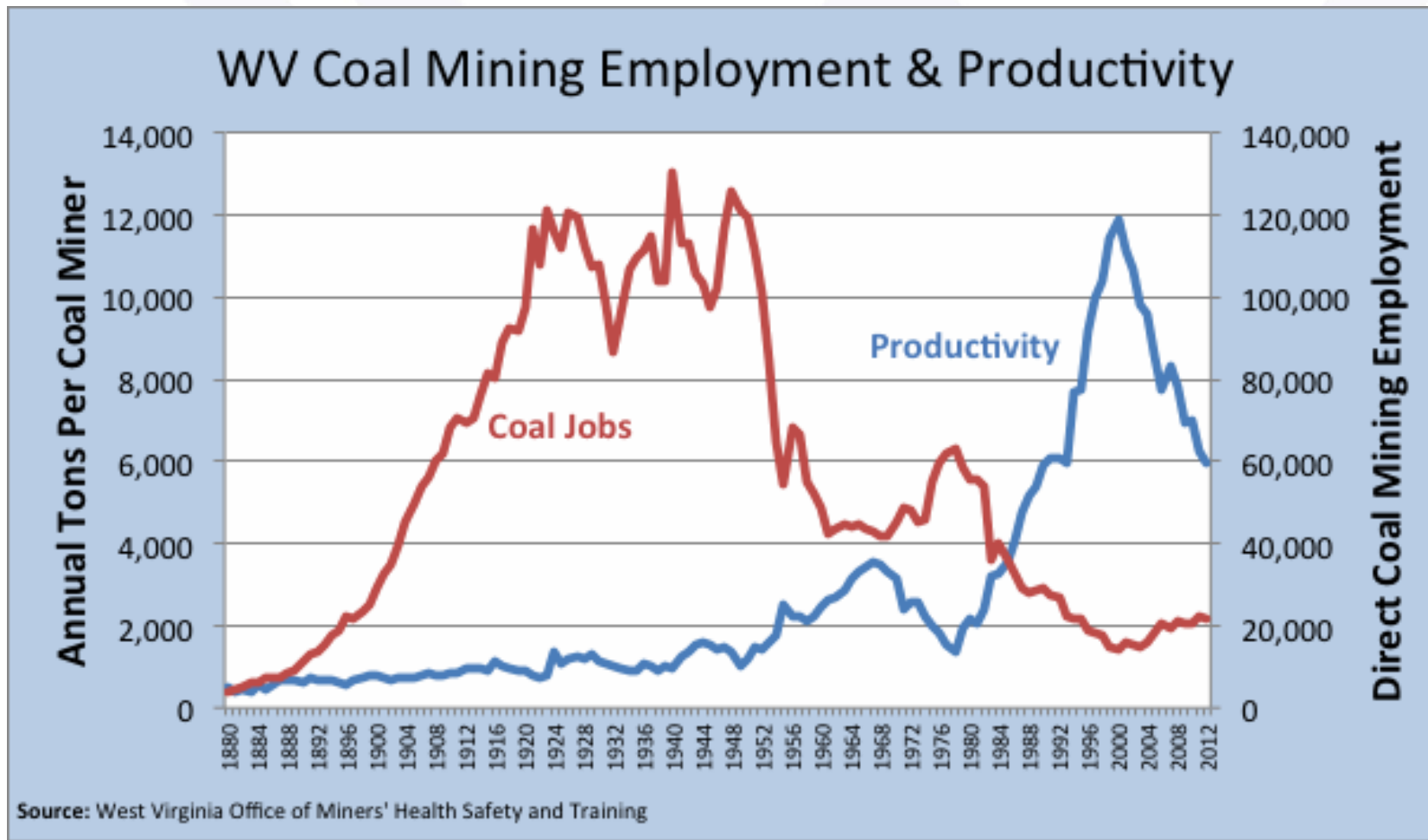
Question #2

- How has the nature of work in high income countries changed over the past 50 years?



Question #3

- Why did this change occur?

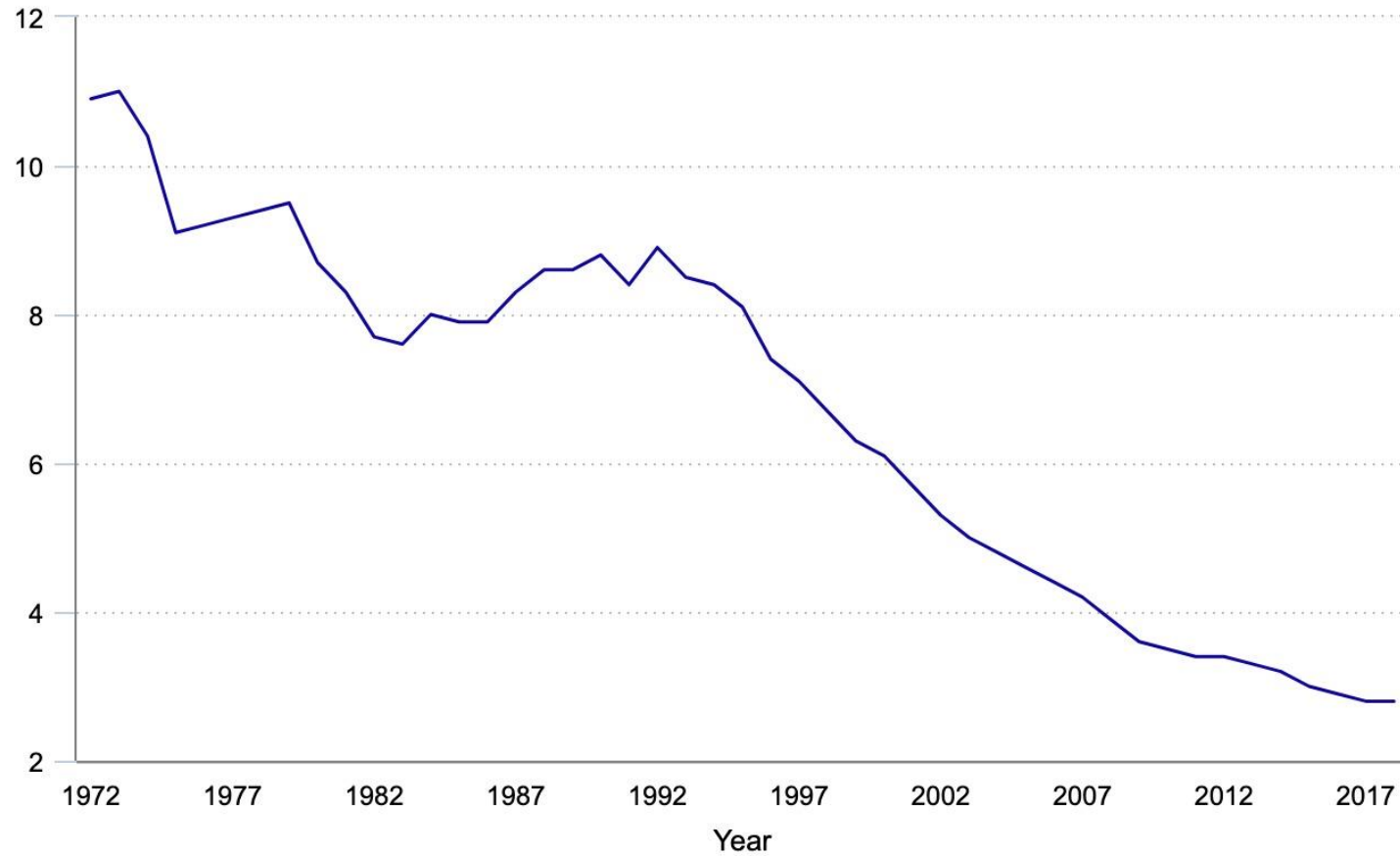


13,000 direct jobs in 2019

Question #4

- How have the health and safety conditions of the workplaces of high income countries changed over the past 50 years?

Chart 1. Incidence rates of nonfatal occupational injuries and illnesses, private industry, 1972–2018



Hover over chart to view data.

Source: U.S. Bureau of Labor Statistics, Survey of Occupational Injuries and Illnesses.



West Virginia Least Healthy State

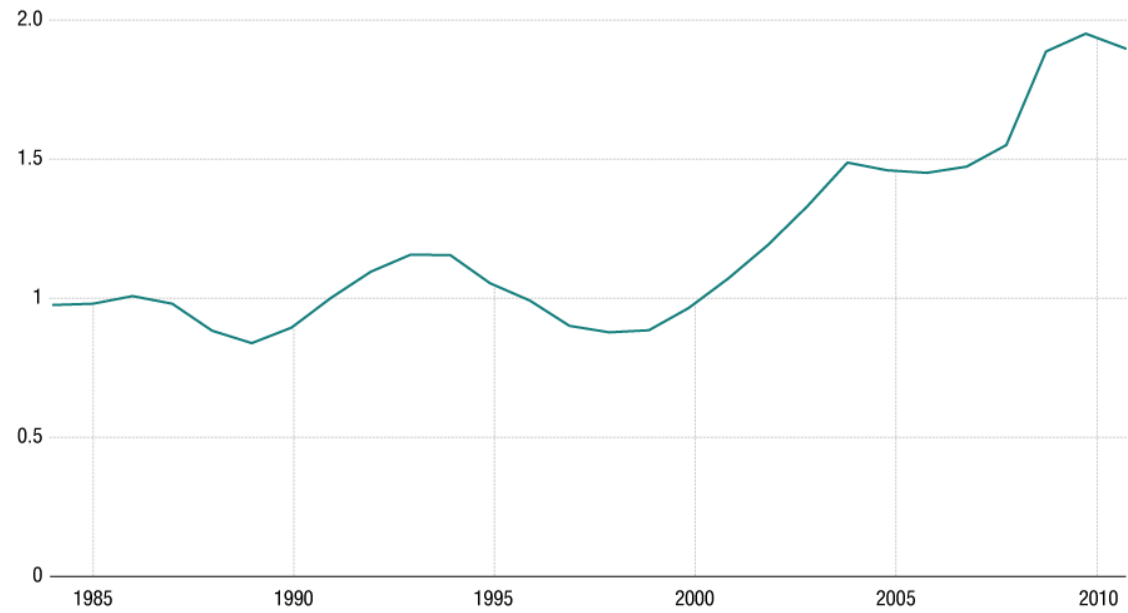
- Combined rate of obesity and overweight 67.9% (#1)
- Opioid-Involved Overdose Deaths 42.4/100,000 (#1)
- Life expectancy 74.4 years (#50)
 - Slightly lower than Palestine (74.6 years)

Question #5

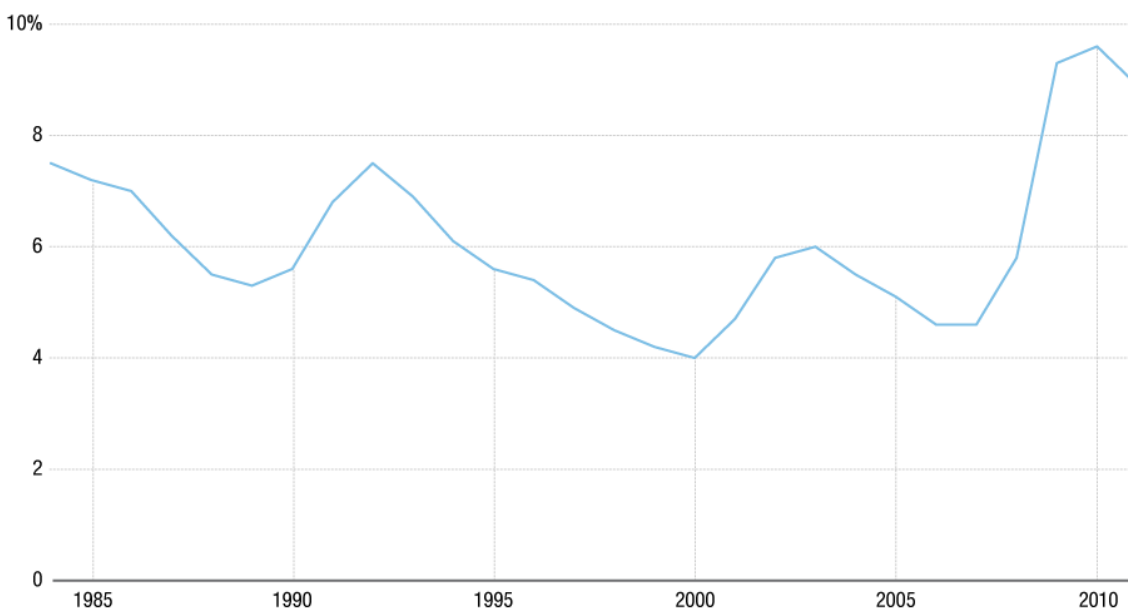
If the jobs are gone, what do people in the those communities do?

Applications For Disability Rise And Fall With the Unemployment Rate

Disability Applications Per 100 Eligible Workers



Unemployment Rate

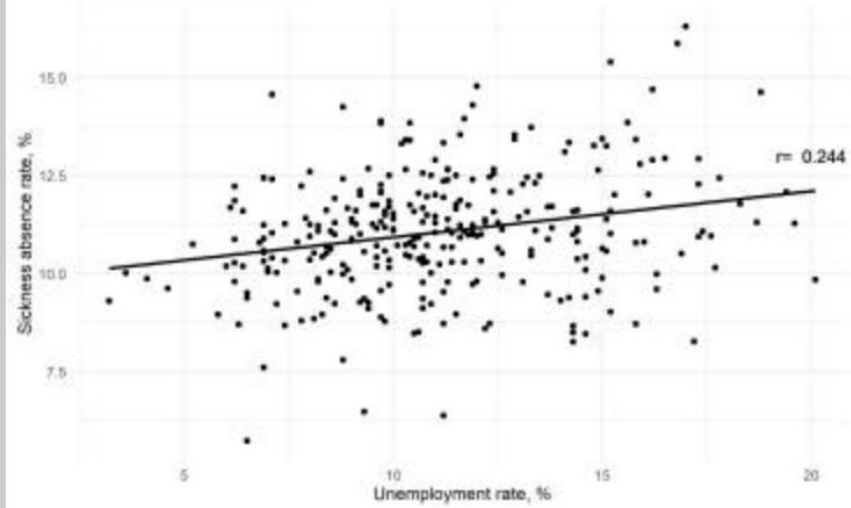


<https://apps.npr.org/unfit-for-work/>

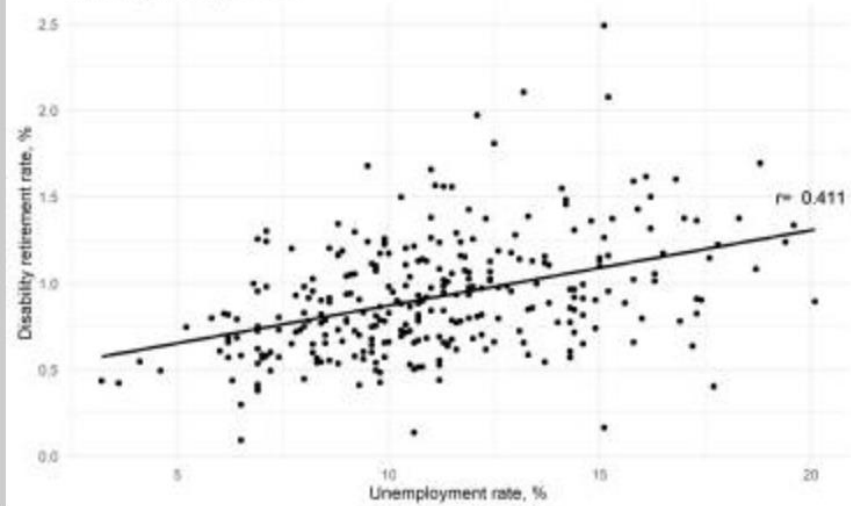
Source: Bureau of Labor Statistics, Social Security Administration

Credit: Lam Thuy Vo / NPR

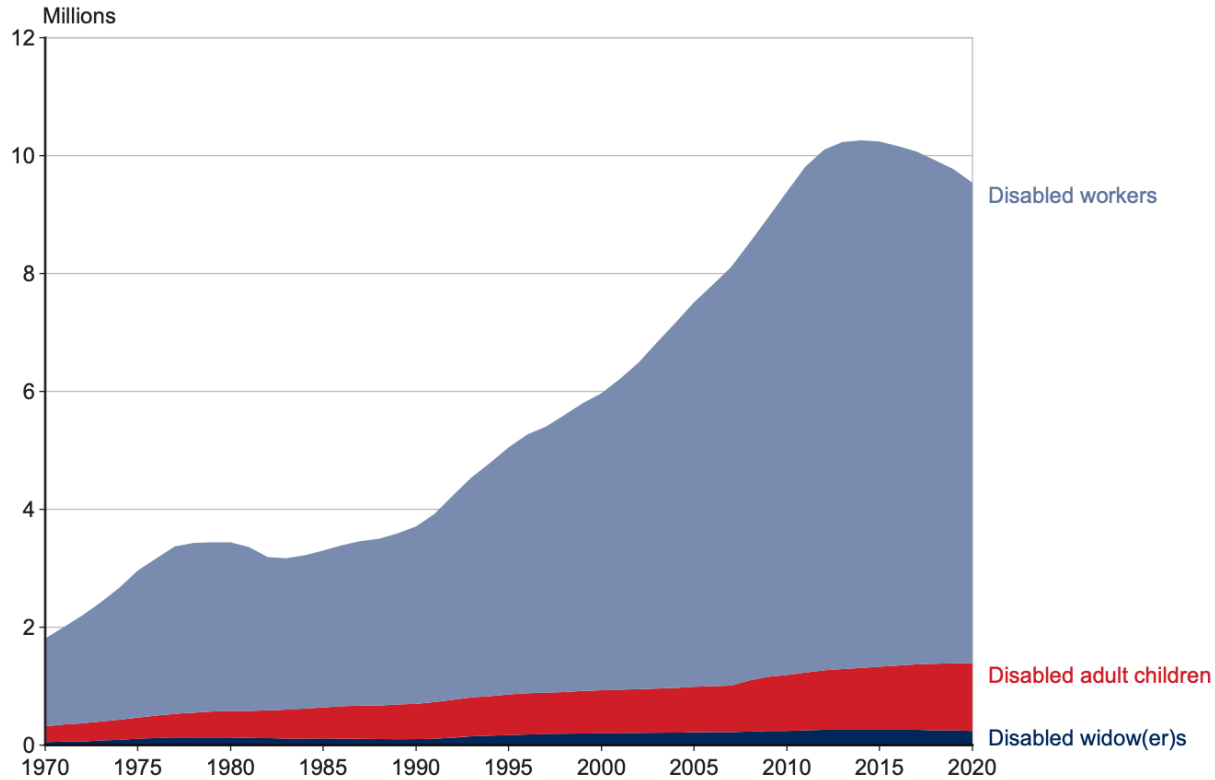
a. Cross-sectional association between the unemployment and sickness absence rates, all municipalities, year 2017



b. Cross-sectional association between the unemployment and disability retirement rates, all municipalities, year 2017



Disability in USA



https://www.ssa.gov/policy/docs/statcomps/di_asr/index.html

Percentage Of Population Age 18-64 On Workers' Disability (2011)

States Where The Percentage Is The Highest



<https://apps.npr.org/unfit-for-work/>

Understanding the metrics of work

- Unemployment – 4.1%

Understanding the metrics of work

- “People with jobs are *employed*.”
- People who are jobless, looking for a job, and available for work are *unemployed*.”
- The *labor force* is made up of the employed and the unemployed.
- People who are neither employed nor unemployed are *not in the labor force*.”

Understanding the metrics of work

- Labor force participation – 55.0%
 - “number of all employed and unemployed workers divided against the state's civilian population”

Question #6a

- What is the leading cause of disability in high income countries?
 - As measured by years lived with disability (YLDs)

Table 2. US Years Lived With Disability (YLDs) Rank, Rate, and Percentage Change for the 25 Leading Causes of Disability and Injury, 1990 and 2016

Diseases and Injuries	YLD Rank		No. of YLDs, in Thousands (95% Uncertainty Interval)		% Change (95% Uncertainty Interval)	
	1990	2016	1990	2016	YLDs	Age-Standardized YLD Rate
Low back pain	1	1	2461.1 (1732.3 to 3228.8)	3069.1 (2211.0 to 3989.6)	24.7 (10.9 to 39.6)	-12.4 (-22.3 to -1.9)
Major depressive disorder	2	2	1726.2 (1192.3 to 2330.5)	2193.0 (1507.6 to 2990.5)	27.0 (21.6 to 32.7)	0.1 (-4.1 to 3.7)
Diabetes mellitus	8	3	1040.2 (716.1 to 1450.3)	2142.9 (1496.1 to 2932.8)	106.0 (92.9 to 119.0)	29.6 (21.2 to 37.5)
Other musculoskeletal disorders	4	4	1573.5 (1076.0 to 2193.9)	2076.5 (1423.2 to 2843.1)	32.0 (22.5 to 42.0)	-2.3 (-8.7 to 4.3)
Migraine	3	5	1580.3 (1013.0 to 2205.4)	2010.1 (1296.4 to 2814.8)	27.2 (25.3 to 29.1)	-1.4 (-2.8 to -0.1)
Neck pain	6	6	1281.8 (880.4 to 1788.4)	1982.6 (1381.1 to 2704.7)	54.7 (39.2 to 73.3)	2.9 (-7.5 to 15.0)
Anxiety disorders	5	7	1341.7 (940.7 to 1813.1)	1755.0 (1229.6 to 2383.4)	30.8 (25.7 to 36.0)	0.6 (-3.2 to 4.5)
Opioid use disorders	7	8	1256.2 (892.8 to 1588.8)	1638.9 (1144.0 to 2097.4)	30.5 (23.3 to 37.4)	10.9 (4.2 to 17.2)
Age-related and other hearing loss	9	9	886.9 (599.0 to 1269.5)	1528.0 (1035.7 to 2157.1)	72.3 (67.3 to 78.3)	9.7 (6.6 to 13.4)
Falls	11	10	722.7 (487.8 to 1010.2)	1389.1 (960.0 to 1922.6)	92.2 (83.8 to 102.6)	22.2 (17.7 to 27.8)
Chronic obstructive pulmonary disease	12	11	674.4 (585.1 to 743.9)	1184.6 (1035.1 to 1307.3)	75.7 (66.8 to 84.9)	7.4 (2.0 to 12.9)
Osteoarthritis	14	12	573.5 (377.6 to 829.6)	1005.0 (659.5 to 1448.2)	75.2 (68.5 to 82.6)	7.9 (3.7 to 12.5)
Acne vulgaris	10	13	855.9 (573.6 to 1236.1)	992.6 (668.0 to 1441.4)	16.0 (14.3 to 17.8)	-1.5 (-3.0 to 0.2)
Dermatitis	13	14	659.8 (405.3 to 1032.9)	830.2 (515.1 to 1296.5)	25.8 (24.0 to 28.0)	1.2 (0.3 to 2.2)
Ischemic stroke	18	15	464.0 (321.3 to 607.7)	716.9 (500.9 to 912.7)	54.5 (41.5 to 64.9)	-3.5 (-11.2 to 2.9)
Schizophrenia	17	16	503.3 (365.0 to 627.7)	685.2 (506.9 to 847.9)	36.1 (32.7 to 39.5)	1.7 (-0.0 to 3.5)
Edentulism and severe tooth loss	19	17	458.0 (301.1 to 649.2)	662.2 (432.6 to 936.6)	44.6 (42.9 to 46.3)	-8.6 (-9.6 to -7.4)
Alcohol use disorders	15	18	558.2 (380.7 to 771.4)	633.9 (440.3 to 852.1)	13.6 (5.0 to 23.7)	-8.6 (-15.2 to -1.1)
Alzheimer disease and other dementias	23	19	360.8 (253.3 to 476.0)	597.6 (431.4 to 774.4)	65.6 (54.5 to 78.4)	-1.1 (-7.0 to 5.7)
Rheumatoid arthritis	25	20	350.2 (245.4 to 464.0)	592.4 (412.6 to 775.9)	69.1 (63.1 to 75.5)	10.1 (6.4 to 14.1)
Asthma	16	21	522.1 (342.5 to 744.9)	591.0 (393.8 to 832.4)	13.2 (7.5 to 19.2)	-12.4 (-17.1 to -7.6)
Other mental and substance use disorders	20	22	421.2 (288.4 to 601.1)	566.1 (390.0 to 804.1)	34.4 (32.9 to 35.9)	0.5 (-0.5 to 1.6)
Dysthymia	22	23	375.1 (254.3 to 548.2)	522.0 (352.7 to 753.3)	39.2 (31.7 to 47.2)	2.5 (-2.7 to 8.1)
Bipolar disorder	21	24	376.4 (236.7 to 545.7)	489.1 (309.6 to 703.2)	29.9 (27.9 to 32.1)	-0.4 (-1.9 to 1.0)
Psoriasis	24	25	351.9 (253.0 to 459.4)	488.2 (350.9 to 635.5)	38.7 (36.9 to 40.6)	1.9 (0.6 to 3.2)

Question #5b

- In light of the response to Question 2, what is puzzling about the high rank of musculoskeletal conditions?

What about those who leave work
because of a work-related condition
causing disability?

Comparing all occupational injuries with disability to those without

- Workers' compensation claimants in Ontario, Canada receiving permanent impairment from any cause and overall mortality
 - HR of 1.29 (95% CI = 1.13-1.45) for women
 - HR of 1.22 (95% CI = 1.15-1.28) for men

Comparing all occupational injuries with disability to those without

- New Mexico workers' compensation claimants from 1994 to 2000 with any disease or injury, comparing lost time (>7 days) to no lost time
 - HRs for lost-time injuries of 1.24 for women (95% CI = 1.15-1.35)
 - 1.21 (95% CI = 1.15-1.27) for men.

Our Study

- Collaborative research between:
 - West Virginia Office of Insurance Commissioner
 - WVU Department of Occupational and Environmental Health, School of Public Health
 - NIOSH Division of Surveillance, Hazard Evaluations and Field Studies

Mortality among West Virginia low back pain workers' compensation claimants

- All claims accepted for primary diagnosis of lumbar strain or lumbosacral strain 1997-1998 (14,219 claims)
- Disability measures – lost days, PPD, PTD
- Search US National Death Index for mortality through 2015

Characteristics of the Study Population

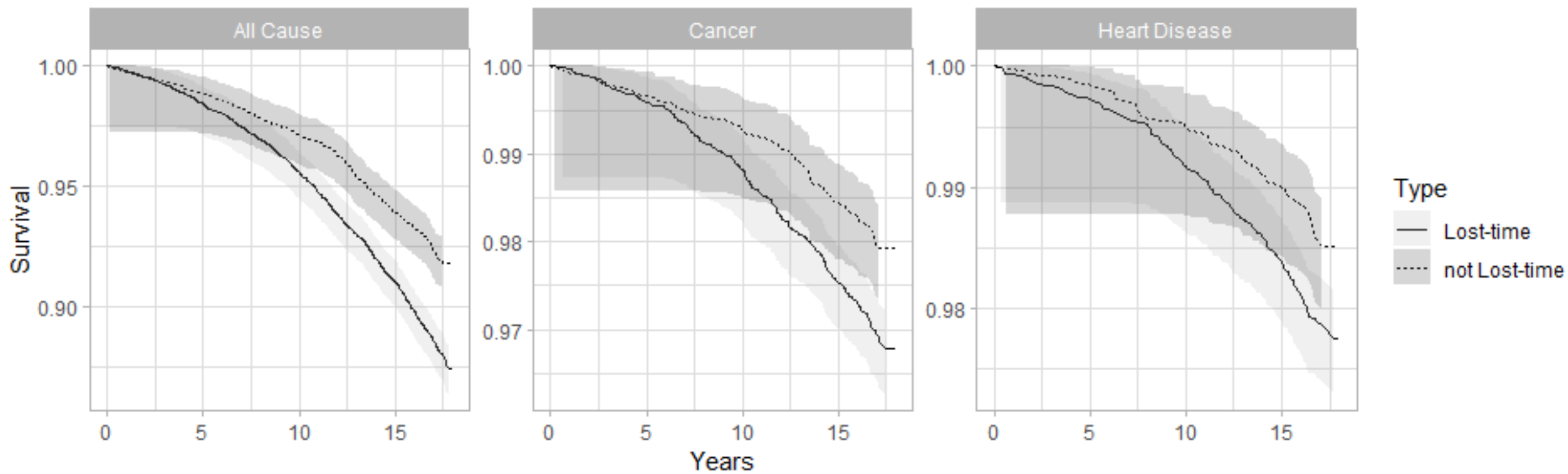
	<u>N (%)</u>	<u>Median (Interquartile range)</u>
Number of workers in analysis	14,218	
Sex		
Male	8,948 (62.9%)	
Female	5,270 (37.1%)	
Vital status (as of 12/31/2015)		
Alive	12,825 (90.2%)	
Deceased	1,393 (9.8%)	
Age at injury		37.7 (29.1-45.8)
Lost work time	8,365 (58.8%)	
Number of lost work days (among those with lost work time)		112 (14-328)
Permanent disability		
Partial	3,944 (27.7%)	
Total	69 (0.5%)	
Percent permanent disability (among those with permanent disability)		10 (6-16)
Surgical treatment	146 (1.0%)	
Single claim	11,571 (81.4%)	
First claim for low back sprain/strain only	8,175 (57.5%)	
Over 95% of county white^c	7,766 (54.6%)	

Adjusted hazard ratios according to disability-related factors

	All deaths		All cancers		Heart diseases		Intentional self-harm		Drug overdoses involving opioids	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Lost time (vs. no lost time)	1.44	1.27-1.63	1.41	1.10-1.81	1.42	1.06-1.92	1.85	1.02-3.37	1.89	1.22-2.93
Per 10 weeks of lost time	1.02	1.01-1.03	1.00	0.98-1.03	1.03	1.00-1.05	1.04	0.99-1.10	1.06	1.02-1.09
Permanent partial disability (vs. no disability)	1.25	1.12-1.40	0.98	0.78-1.23	1.25	0.95-1.63	1.28	0.75-2.18	2.31	1.59-3.37
Permanent total disability (vs. no disability)	1.11	0.61-2.03	1.37	0.51-3.71	1.38	0.43-4.50	3.36	0.46-24.82	3.16	0.43-23.04
Percent permanent disability (per 10%)	1.10	1.03-1.17	0.97	0.85-1.11	1.13	0.98-1.31	1.27	0.96-1.68	1.40	1.14-1.71
Surgical treatment	0.90	0.55-1.48	0.40	0.10-1.61	0.92	0.29-2.87	1.46	0.20-10.56	0	NC

Explanation?

- “The literature has attributed this positive association to causation and selection that are at work simultaneously: [not working] may have adverse effects on health (=causation), but on the other hand, health problems and weak work ability also increase the risk of [not working] (=selection).”



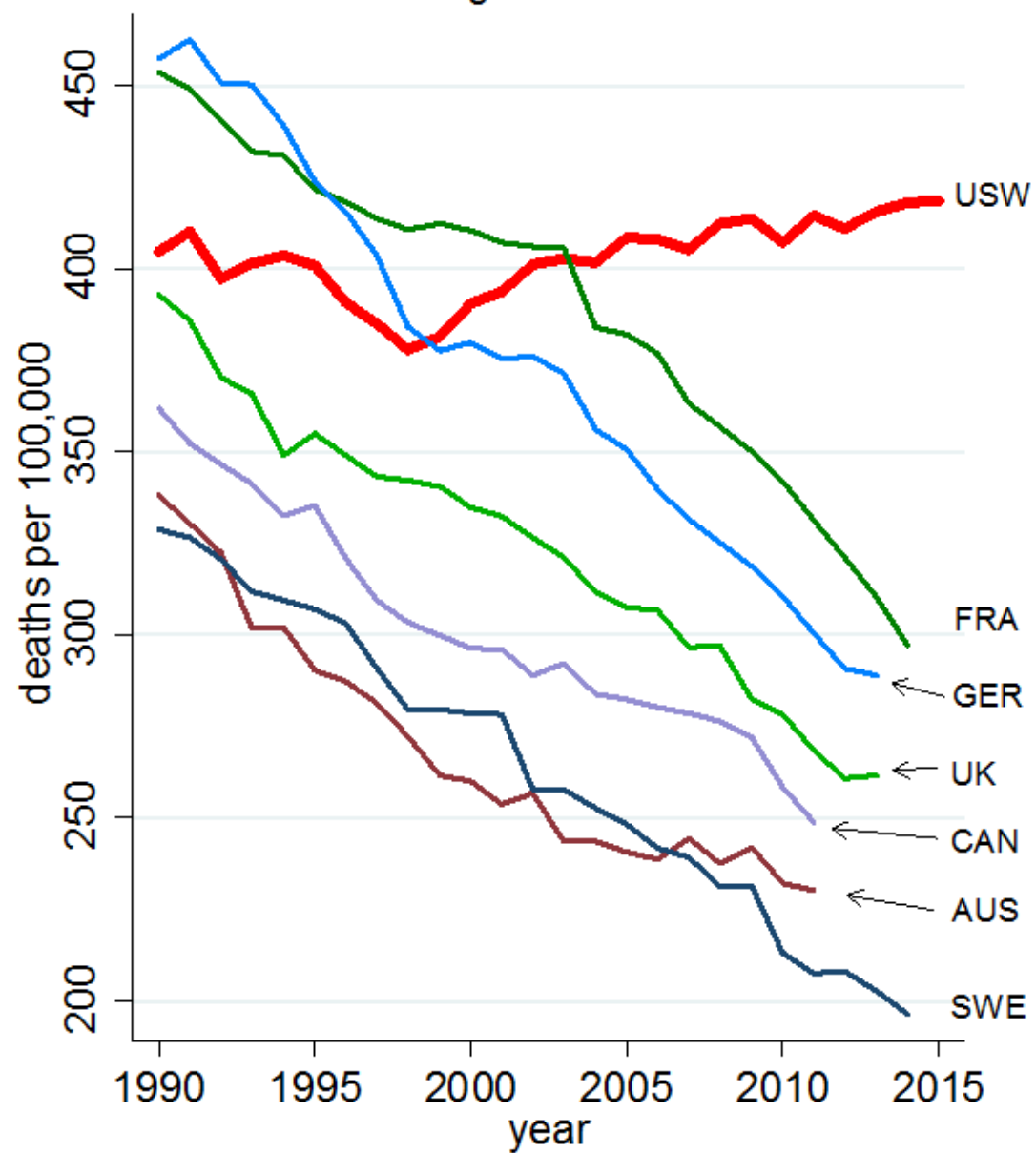
The bigger picture

- *Mortality and morbidity in the 21st century*
- <https://www.brookings.edu/bpea-articles/mortality-and-morbidity-in-the-21st-century/>

Anne Case and Sir Angus Deaton

Figure 1.3

All-cause mortality rates
ages 45-54



Age-adjusted mortality rates
ages 45-54, base year=2010

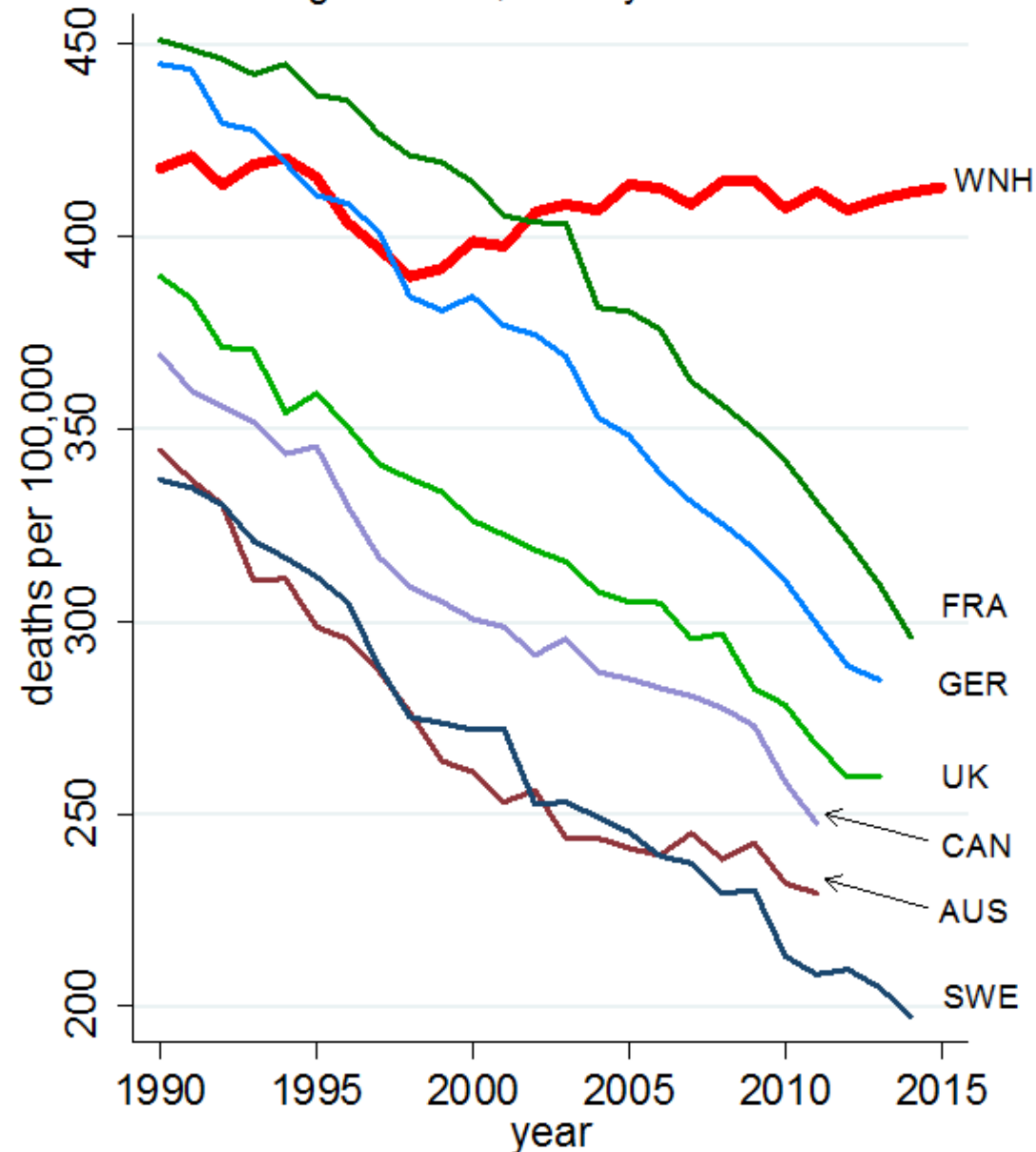


Figure 1.9 All-cause mortality, white non-Hispanics, ages 45-54

2000

2014

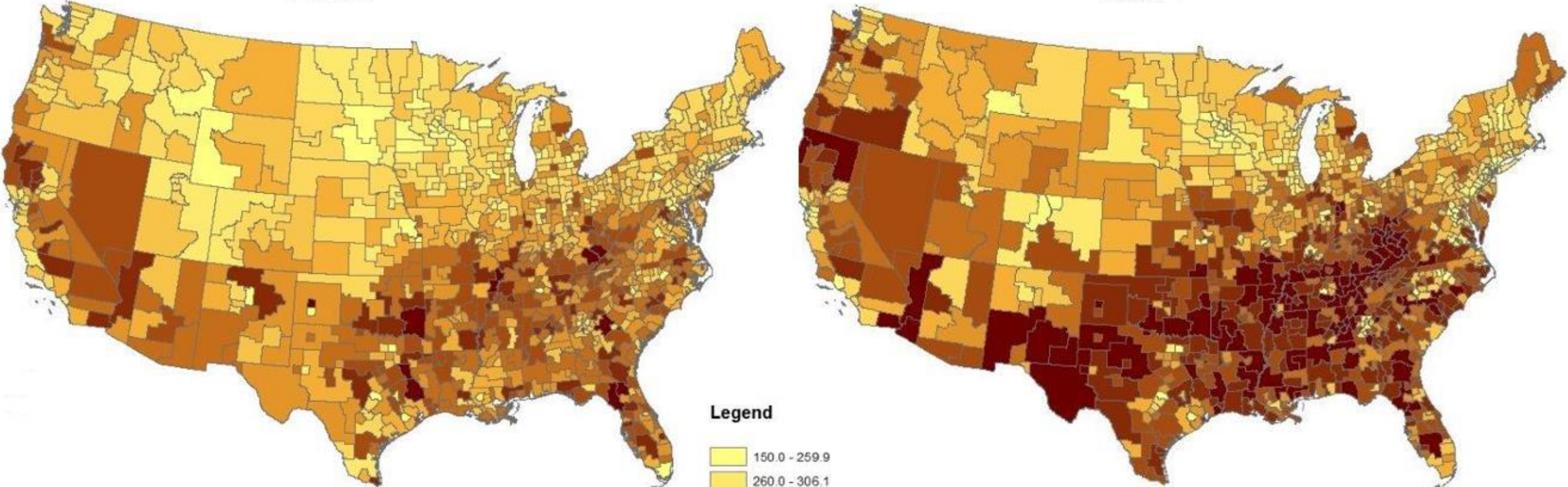


Figure 1.1 All-cause mortality by race and ethnicity, ages 50-54

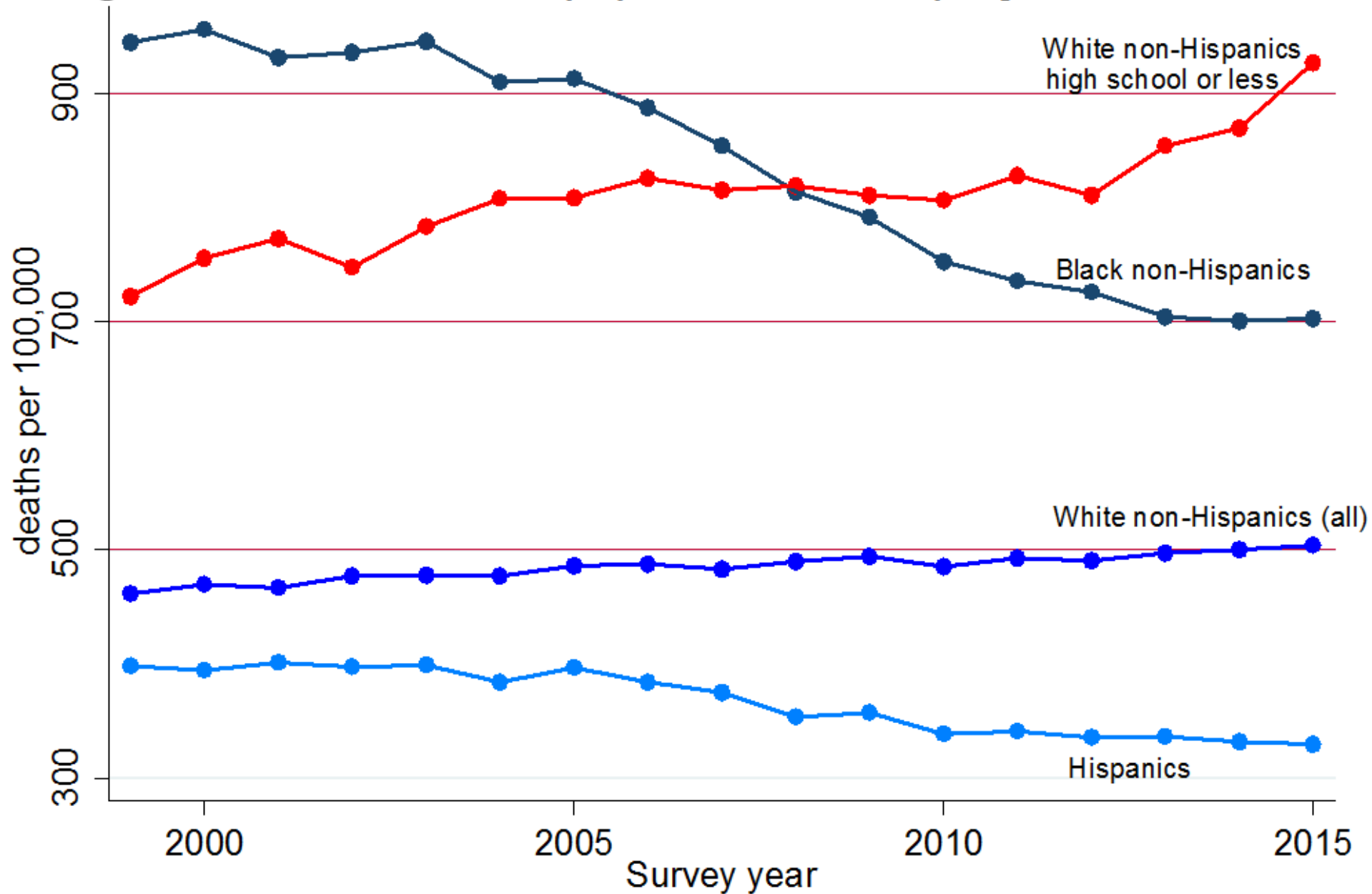


Figure 2.3

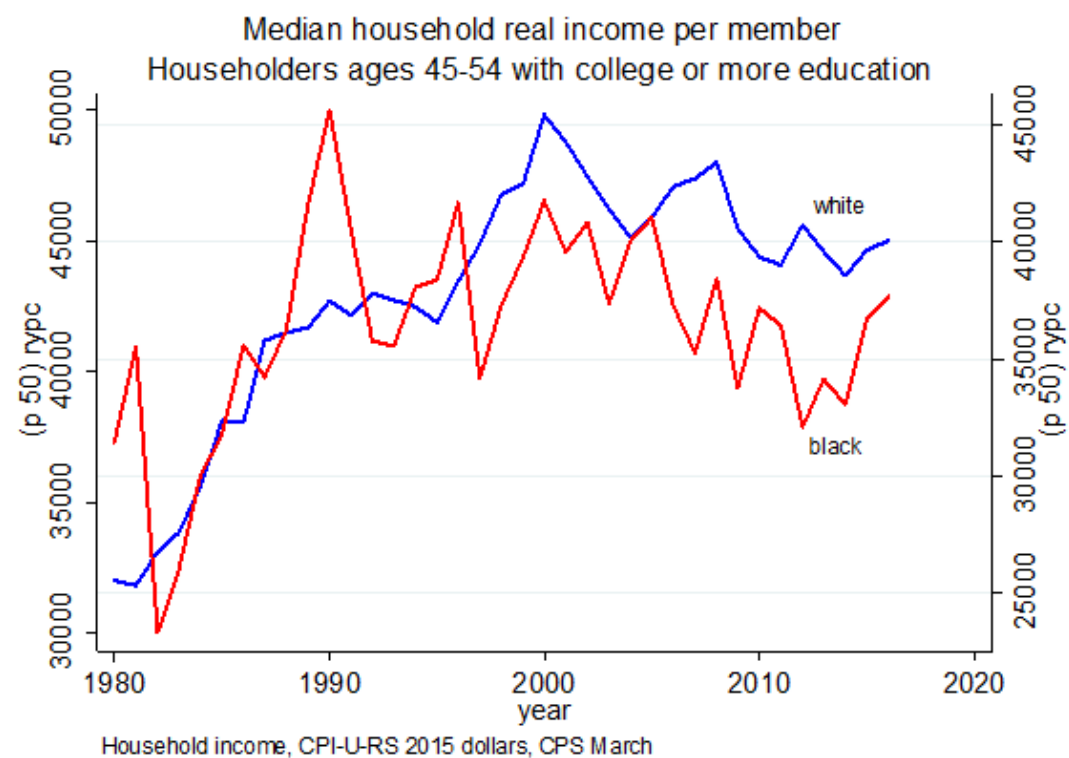
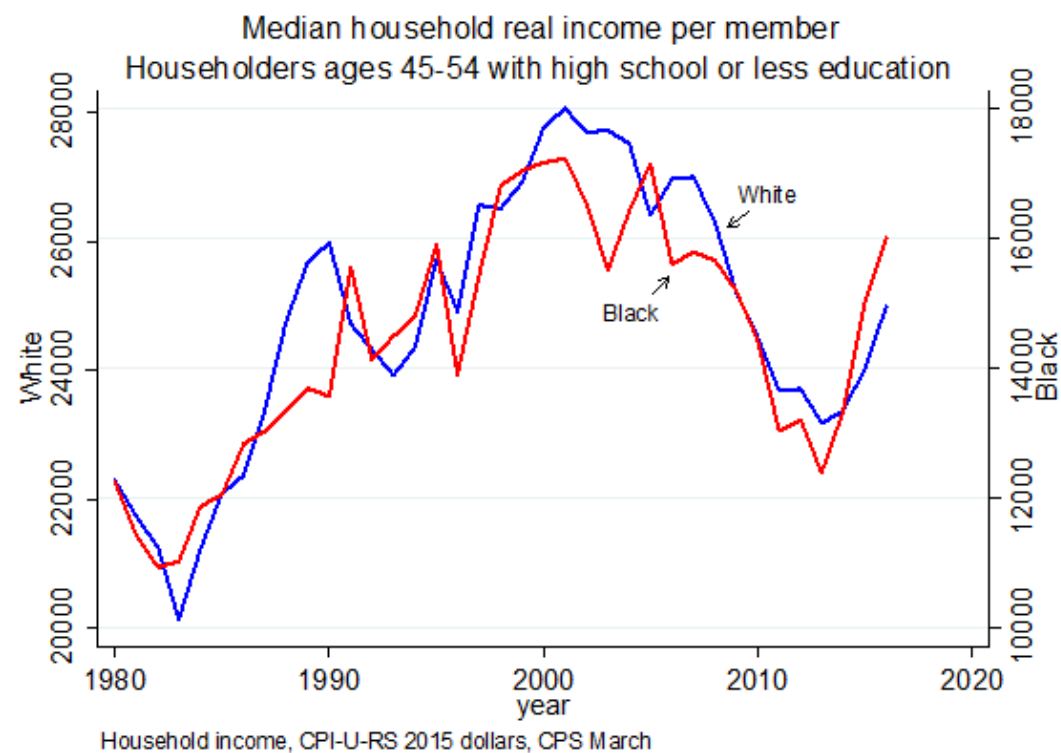


Figure 1.5 Drug, alcohol and suicide mortality, men and women ages 50-54

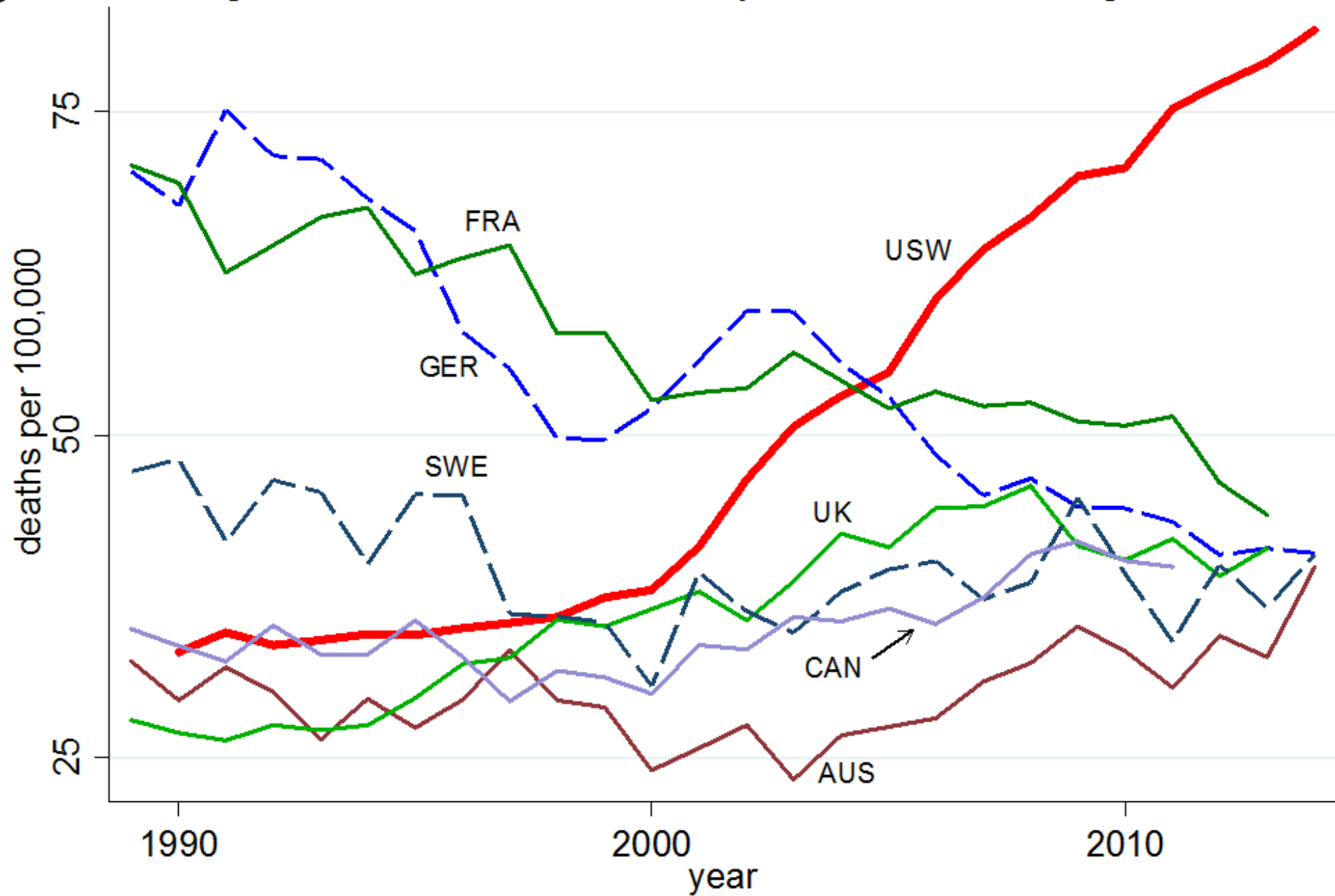
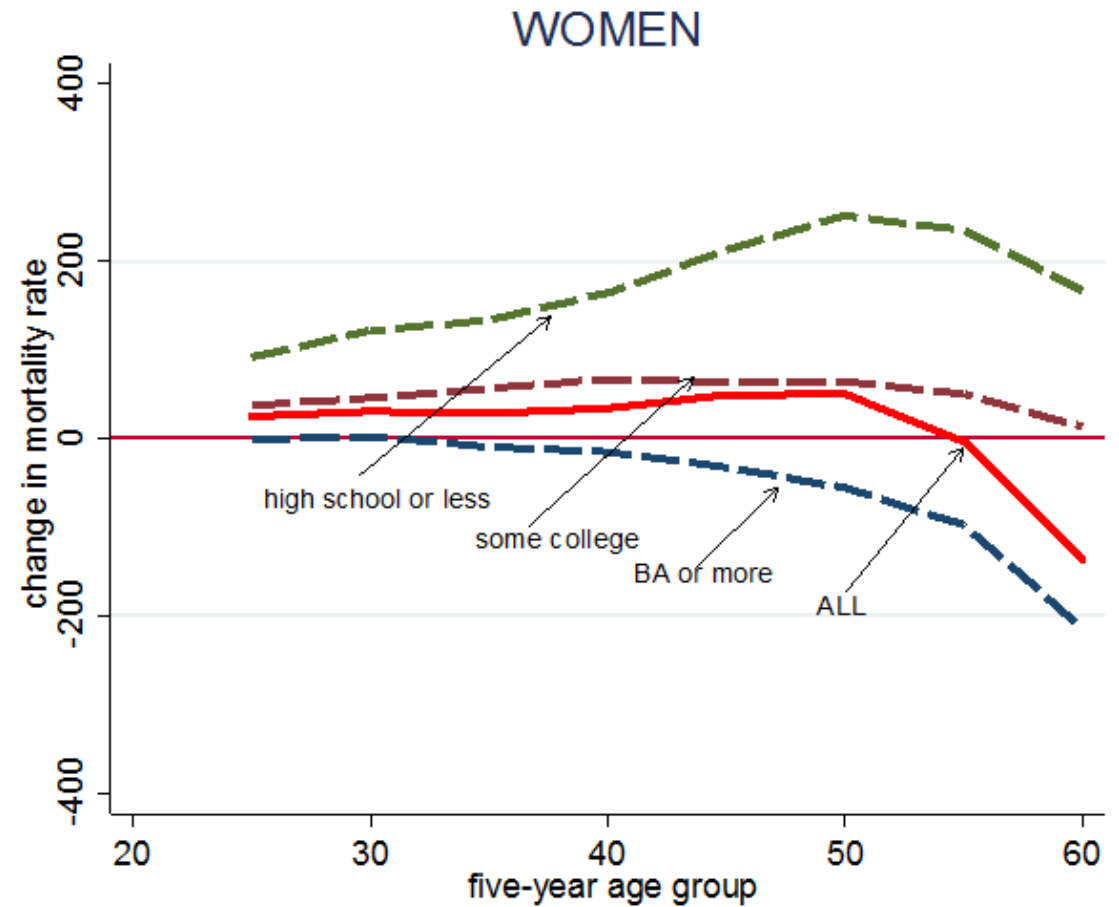
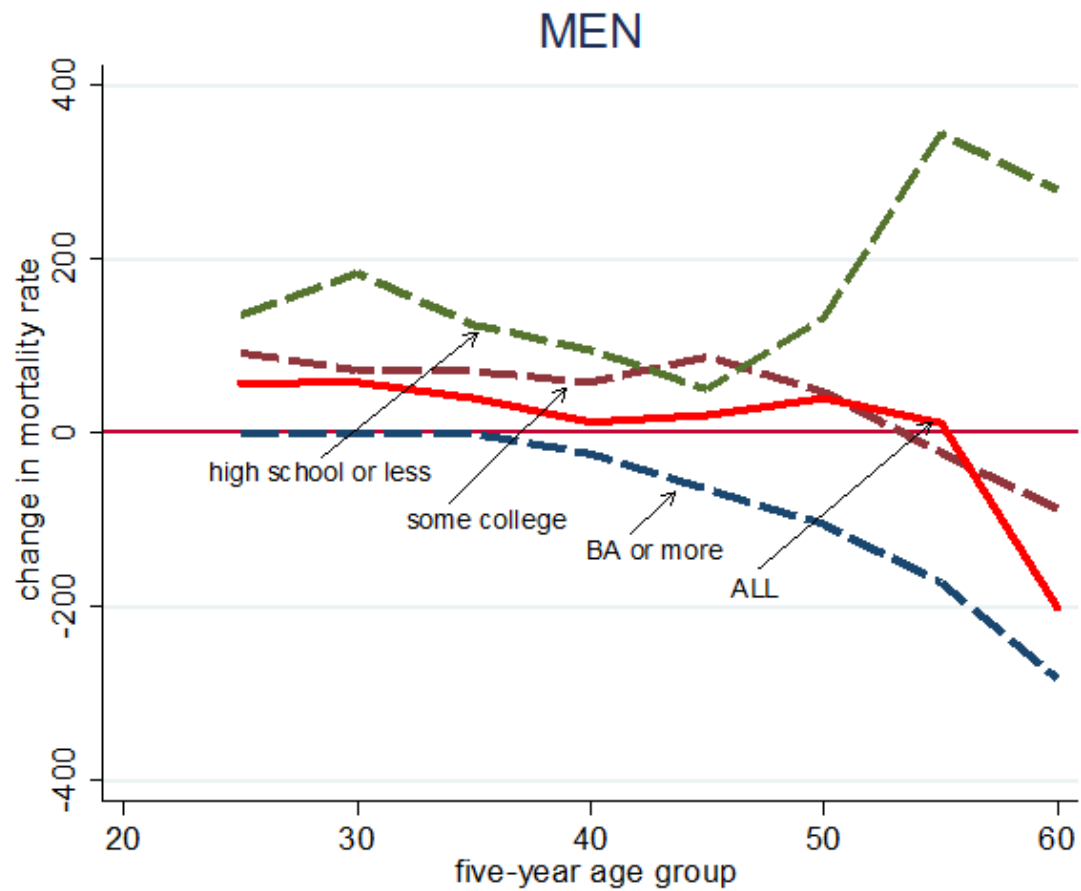


Figure 1.10 Change in mortality rates, white non-Hispanics 1998-2015



Case and Deaton, 2017

- Cumulative disadvantage
 - Job
 - Marriage
 - Child outcomes
 - Health
- Social collapse of the white, high school educated, working class

Deaths of Despair (2020)

"Destroy work and, in the end, working-class life cannot survive. It is the loss of meaning, of dignity, of pride, and of self-respect that comes with the loss of marriage and of community that brings on despair, not just or even primarily the loss of money."

Questions?

- *“To find joy in work is to discover the fountain of youth.”*
- Pearl S. Buck