A. INTRODUCTION: U.S. HEALTH MARKET and TRENDS

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Bhattacharya, Hyde and Tu Chapter 1: Why Health Economics

A.1 Special Features of Health Care Economics

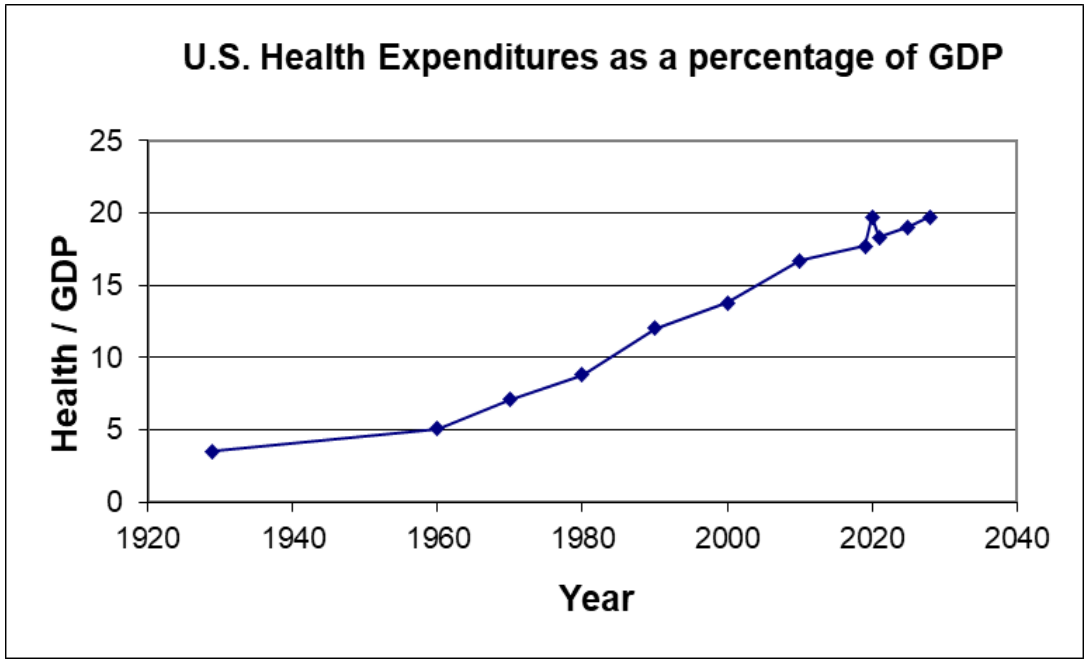
- The health care market is massive: 18.3% of U.S. GDP in 2021
  - big growth due to Covid-19 Pandemic now slower growth.
- Uncertainty is central
  - demand is uncertain – so want insurance
  - there are information asymmetries between consumers and providers leading to
    adverse selection (who chooses insurance)
    and moral hazard (higher demand given insured).
- The government has a major role
  - even in the U.S. 50% of health expenditures are by govt.
- There is a role for both positive and normative economics, and increasingly behavioral economics.

A.2 U.S. Health Expenditures

A.2.1 Total expenditures in 2021

Source: https://www.healthaffairs.org/doi/epdf/10.1377/hlthaff.2022.01397

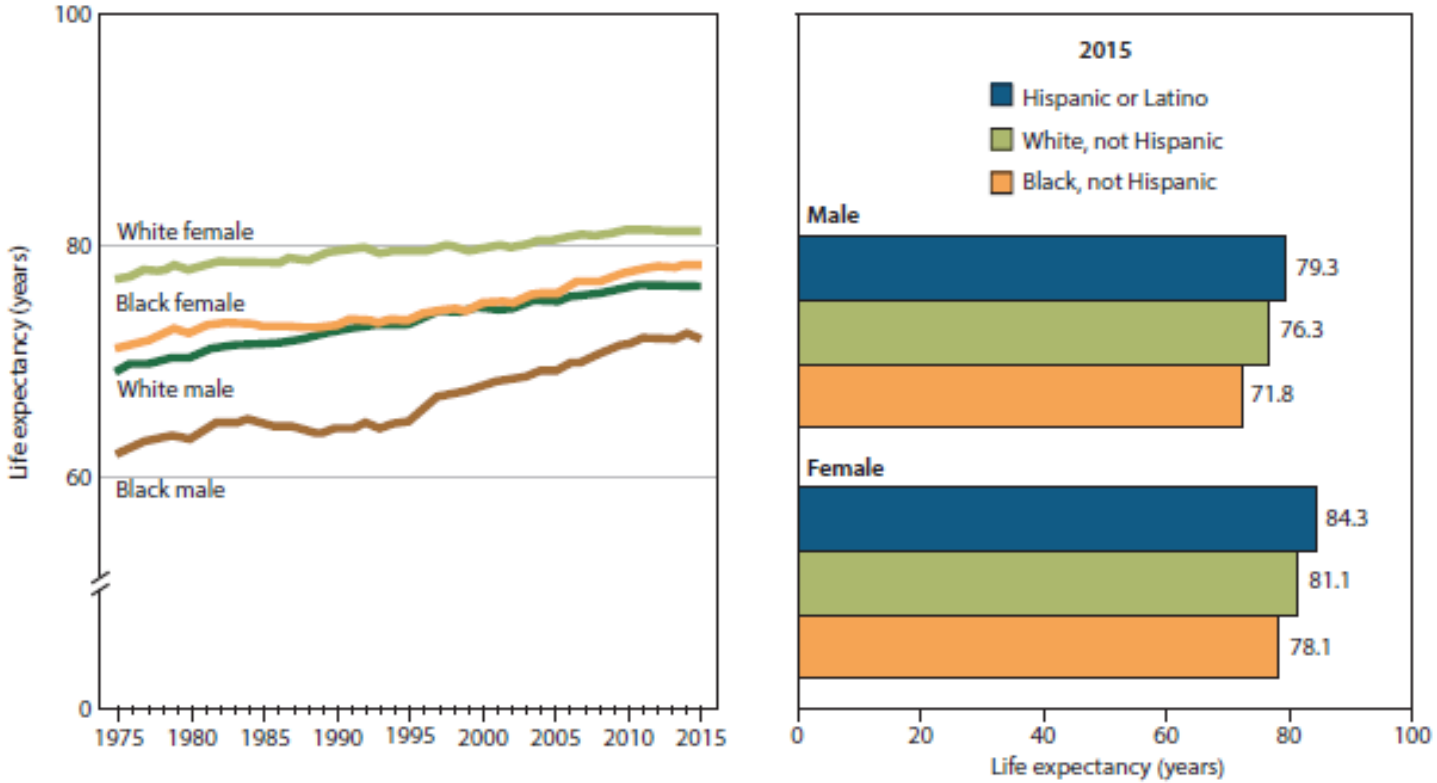
- $4,250 billion (i.e. $4.25 trillion)
- $12,900 per capita (Based on population of 329.5 million)
- 18.3% of GDP (Based on GDP of $23,300 billion).
- Dramatic and continuous rise over past 100 years.



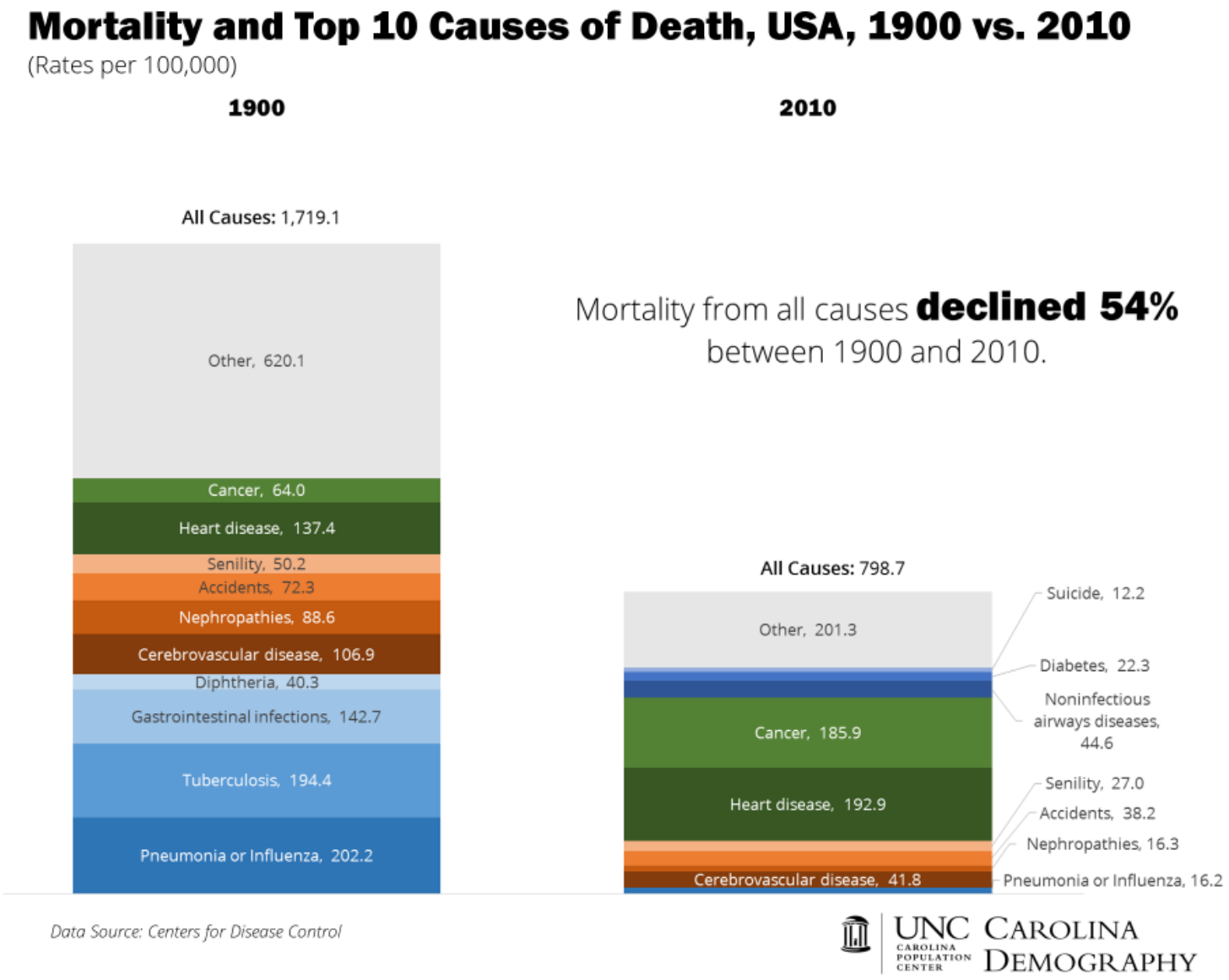
A.3 U.S. Health Outcomes

- Life expectancy at birth (both sexes) has increased greatly 47 in 1900, 60 in 1930, 70 in 1960, 75 in 1990, 79 in 2019.
- Race and gender differences exist but have narrowed.

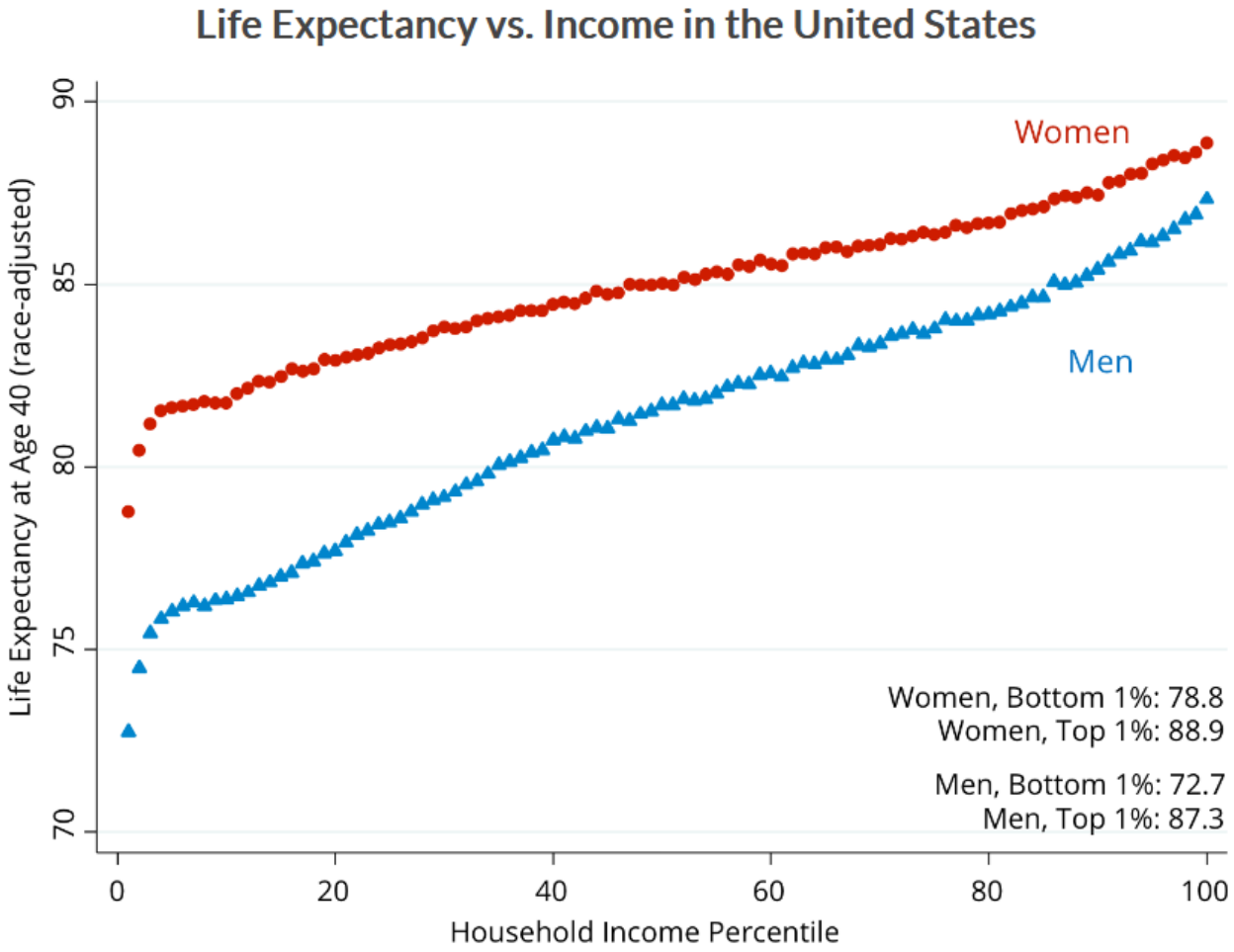
Figure 6. Life expectancy at birth, by sex, race and Hispanic origin: United States, 1975–2015



1900: Infectious Diseases versus 2010: Chronic diseases



- Men: 15 years difference top 1% versus bottom 1% and 7 years difference top 20% versus bottom 20%

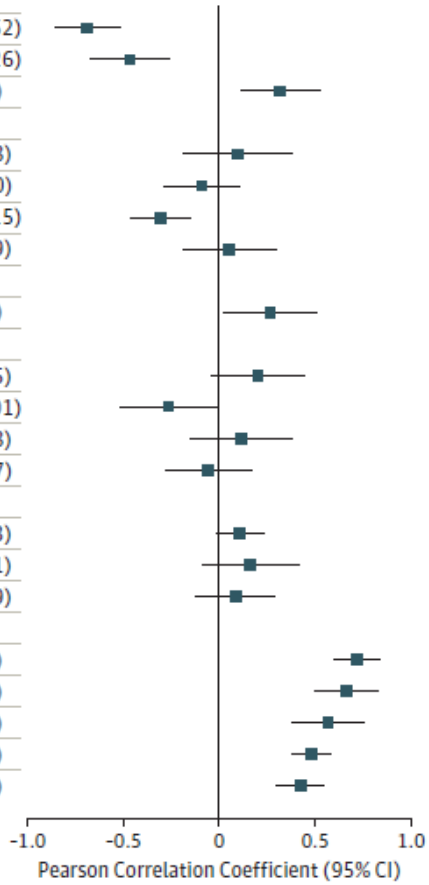


The richest American men live 15 years longer than the poorest men, while the richest American women live 10 years longer than the poorest women.

Chetty et al. "The Association Between Income and Life Expectancy in the United States, 2001-2014," JAMA. 2016; 315(16):1750-1766.

Figure 8. Correlations Between Life Expectancy in the Bottom Income Quartile and Local Area Characteristics, 2001-2014

	Pearson Correlation Coefficient (95% CI)
Health behaviors[a]	
Current smokers	-0.69 (-0.86 to -0.52)
Obesity	-0.47 (-0.67 to -0.26)
Exercise rate	0.32 (0.11 to 0.52)
Access to health care	
% Uninsured	0.10 (-0.19 to 0.38)
Medicare $ per enrollee	-0.09 (-0.28 to 0.10)
30-d Hospital mortality rate index	-0.31 (-0.46 to -0.15)
Index for preventive care	0.05 (-0.19 to 0.29)
Environmental factors	
Income segregation	0.26 (0.02 to 0.51)
Income inequality and social cohesion	
Gini index	0.20 (-0.04 to 0.45)
Index for social capital	-0.26 (-0.52 to -0.01)
% Religious	0.12 (-0.15 to 0.38)
% Black adults	-0.06 (-0.28 to 0.17)
Local labor market conditions	
Unemployment rate in 2000	0.11 (-0.01 to 0.23)
% Change in population, 1980-2000	0.16 (-0.09 to 0.41)
% Change in labor force, 1980-2000	0.09 (-0.12 to 0.29)
Other factors	
% Immigrants	0.72 (0.60 to 0.84)
Median home value	0.66 (0.50 to 0.83)
Local government expenditures	0.57 (0.38 to 0.75)
Population density	0.48 (0.38 to 0.58)
% College graduates	0.42 (0.30 to 0.55)

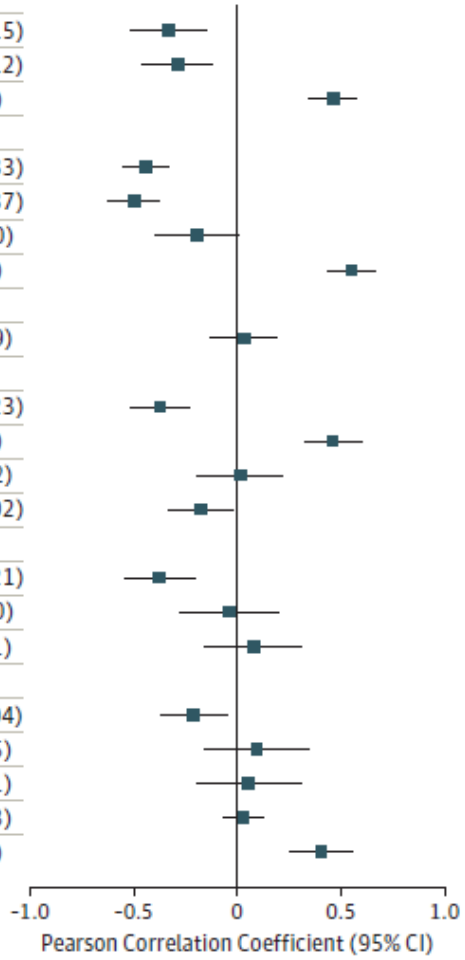


Population-weighted univariate Pearson correlations estimated between local area characteristics and race- and ethnicity-adjusted expected age at death for 40-year-olds in the bottom income quartile. These correlations were computed at the commuting zone level after averaging life expectancy across sexes. The error bars indicate 95% confidence intervals with errors clustered by state. Definitions and sources of all variables appear in eTable 3 in the Supplement.

[a] Among individuals in the bottom income quartile.

Figure 9. Correlations Between Life Expectancy in the Top Income Quartile and Local Area Characteristics, 2001-2014

	Pearson Correlation Coefficient (95% CI)
Health behaviors[a]	
Current smokers	-0.33 (-0.51 to -0.15)
Obesity	-0.29 (-0.46 to -0.12)
Exercise rate	0.46 (0.35 to 0.58)
Access to health care	
% Uninsured	-0.44 (-0.55 to -0.33)
Medicare $ per enrollee	-0.50 (-0.62 to -0.37)
30-d Hospital mortality rate index	-0.19 (-0.39 to 0.00)
Index for preventive care	0.55 (0.44 to 0.67)
Environmental factors	
Income segregation	0.03 (-0.13 to 0.19)
Income inequality and social cohesion	
Gini index	-0.37 (-0.52 to -0.23)
Index for social capital	0.46 (0.32 to 0.60)
% Religious	0.02 (-0.19 to 0.22)
% Black adults	-0.18 (-0.33 to -0.02)
Local labor market conditions	
Unemployment rate in 2000	-0.38 (-0.54 to -0.21)
% Change in population, 1980-2000	-0.04 (-0.27 to 0.20)
% Change in labor force, 1980-2000	0.08 (-0.15 to 0.31)
Other factors	
% Immigrants	-0.21 (-0.37 to -0.04)
Median home value	0.10 (-0.16 to 0.35)
Local government expenditures	0.05 (-0.20 to 0.31)
Population density	0.03 (-0.06 to 0.13)
% College graduates	0.41 (0.25 to 0.56)

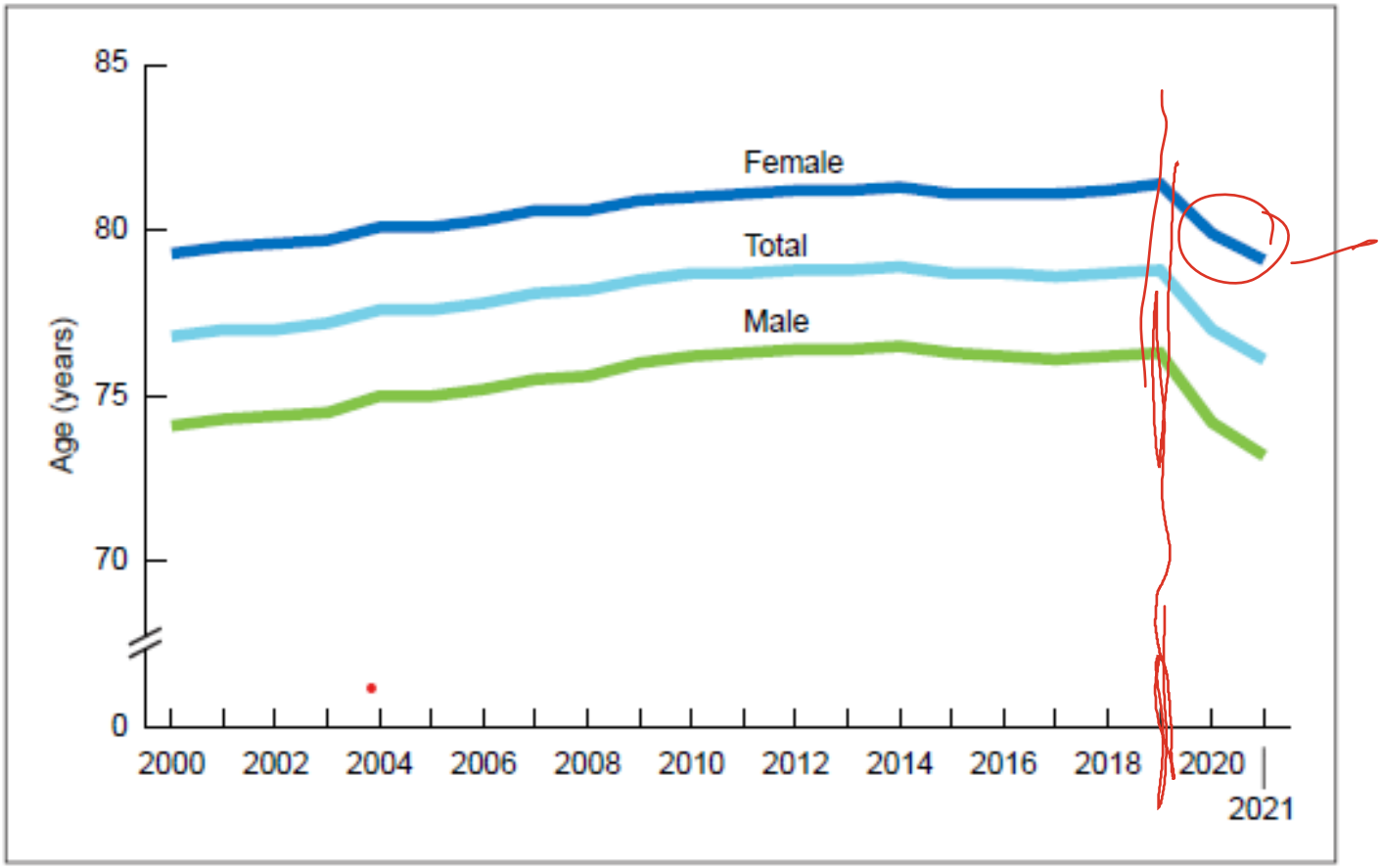


Population-weighted univariate Pearson correlations estimated between local area characteristics and race- and ethnicity-adjusted expected age at death for 40-year-olds in the top income quartile. These correlations were computed at the commuting zone level after averaging life expectancy across sexes. The error bars indicate 95% confidence intervals with errors clustered by state. Definitions and sources of all variables appear in eTable 3 in the Supplement.

[a] Among individuals in the top income quartile.

- Recent drop in life expectancy due to opioids, obesity and Covid19.

Figure 1. Life expectancy at birth, by sex: United States, 2000–2021

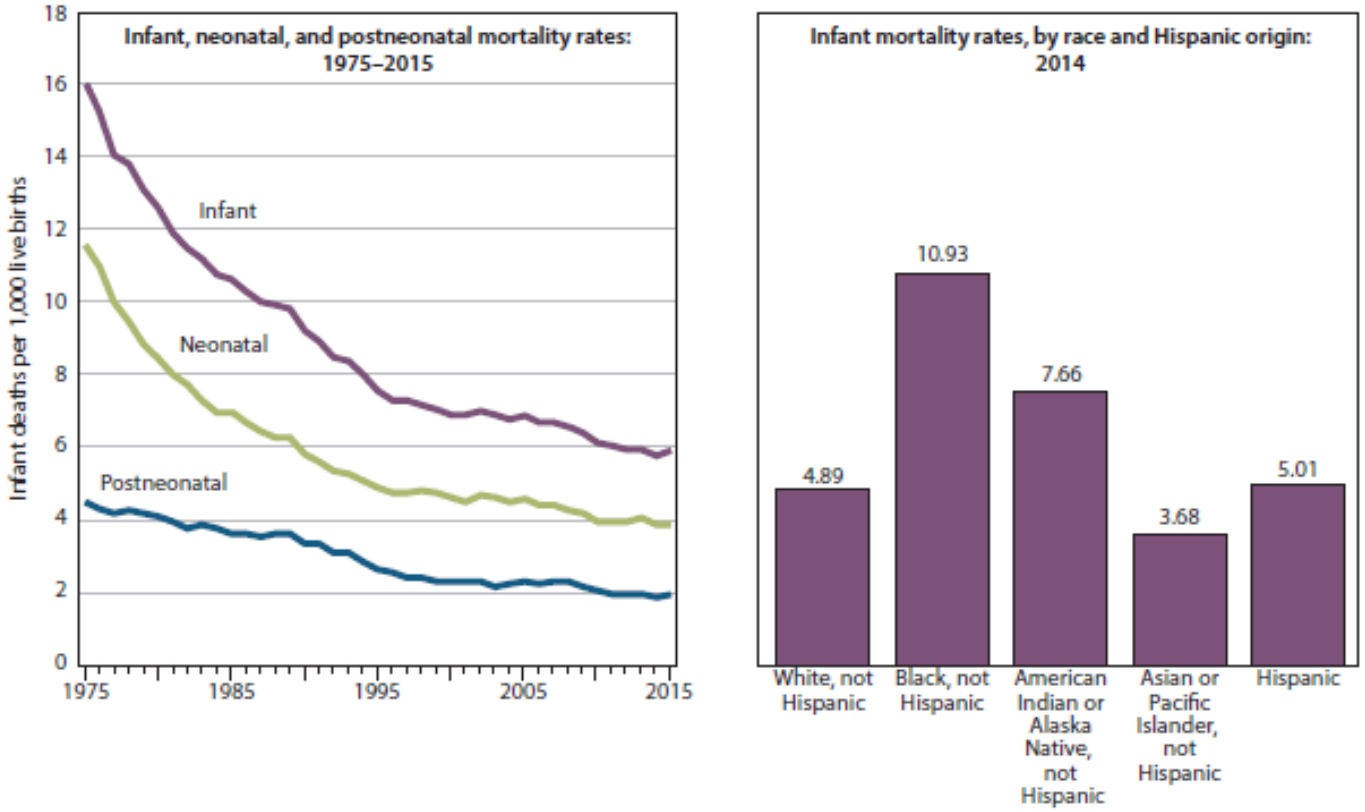


NOTES: Estimates are based on provisional data for 2021. Provisional data are subject to change as additional data are received. Estimates for 2000–2020 are based on final data.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

A.3 U.S. Health Outcomes (continued)

- Infant mortality has decreased greatly in the past forty years.
- But there is a big racial difference.

Figure 7. Infant mortality rates, by infant age at death and race and Hispanic origin of mother: United States, 1975–2015



NOTES: Infant (under 1 year of age), neonatal (under 28 days), and postneonatal (28 days–11 months) rates are based on the number of deaths from the mortality file and

SOURCE: NCHS, National Vital Statistics System (NVSS).

A.4 International Comparisons

- 2020 data on OECD countries (leading developed countries).

U.S. spends much more with lower outcomes than expected.

Country	hlthpcppp	healthgdp	gdppcppp	lifeexp	infmort
Australia	5627	10.6	52858	83.2	3.2
Austria	5883	11.5	51270	81.3	3.1
Belgium	5407	11.1	48866	80.8	3.3
Canada	5828	12.9	45041	81.7	4.5
Chile	2413	9.8	24739	80.8	5.6
Colombia	1336	9	14855	76.7	16.8
Costa Rica	1618	7.9	20596	80.6	7.9
Czech Republic	3805	9.2	41181	78.3	2.3
Denmark	5694	10.5	54081	81.6	3.2
Estonia	2729	7.8	35207	78.9	1.4
Finland	4605	9.6	47900	82	1.8
France	5468	12.2	44805	82.3	3.6
Germany	6939	12.8	54118	81.1	3.1
Greece	2486	9.5	26147	81.4	3.2
Hungary	2402	7.3	33131	75.7	3.4
Iceland	4620	9.5	48546	83.1	2.9
Ireland	5373	7.1	75663	82.6	3
Israel	3057	8.3	36748	82.7	2.5
Italy	3747	9.6	38895	82.3	2.4
Japan	4666	11.1	41904	84.7	1.8
Korea	3582	8.4	42830	83.5	2.5
Latvia	2228	7.4	29917	75.5	3.5

Lithuania	2882	7.5	38231	75.1	2.8
Luxembourg	5628	5.8	97598	82.2	4.5
Mexico	1227	6.2	19653	75.2	13.8
Netherlands	6180	11.1	55496	81.4	3.8
New Zealand	4469	9.7	45986	82.3	4.3
Norway	6582	11.4	57643	83.3	1.6
Poland	2286	6.5	35209	76.5	3.6
Portugal	3348	10.5	31740	81.1	2.4
Slovak Republic	2126	7.2	29393	77	5.1
Slovenia	3474	9.5	36748	80.6	2.2
Spain	3718	10.7	34703	82.4	2.6
Sweden	5757	11.5	50076	82.4	2.4
Switzerland	7179	11.8	60856	83.1	3.6
Türkiye	1305	4.6	28253	78.6	8.5
United Kingdom	5019	12	41899	80.4	3.6
United States	11859	18.8	63027	77	5.4
OECD AVERAGE	4278	9.7	44156	80.5	4.1

healthpcppp = health spending per capita in US dollars at purchasing power parity

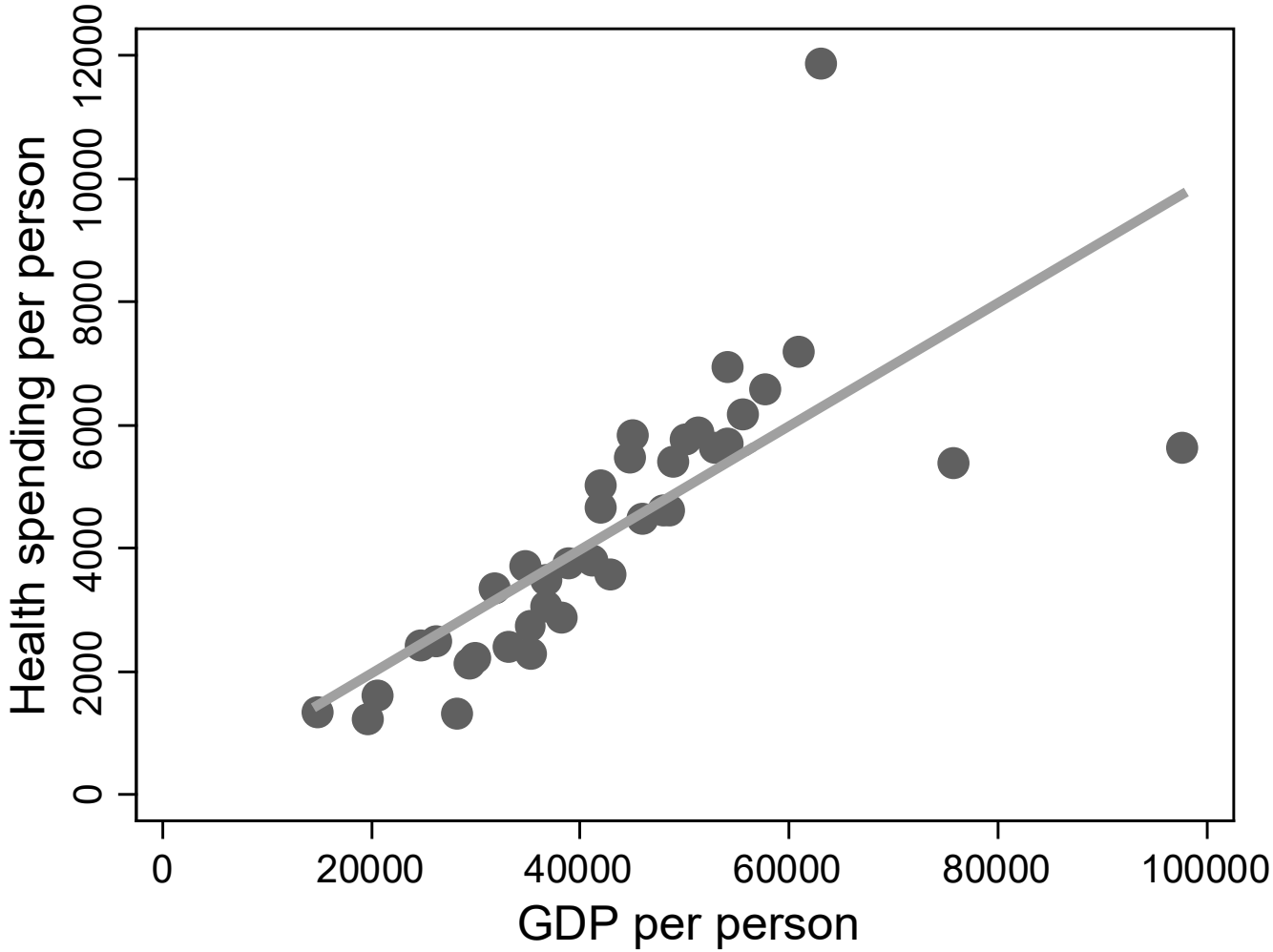
healthgdp = health spending as a percentage of GDP

gdppcppp = GDP per capita in US dollars at purchasing power parity

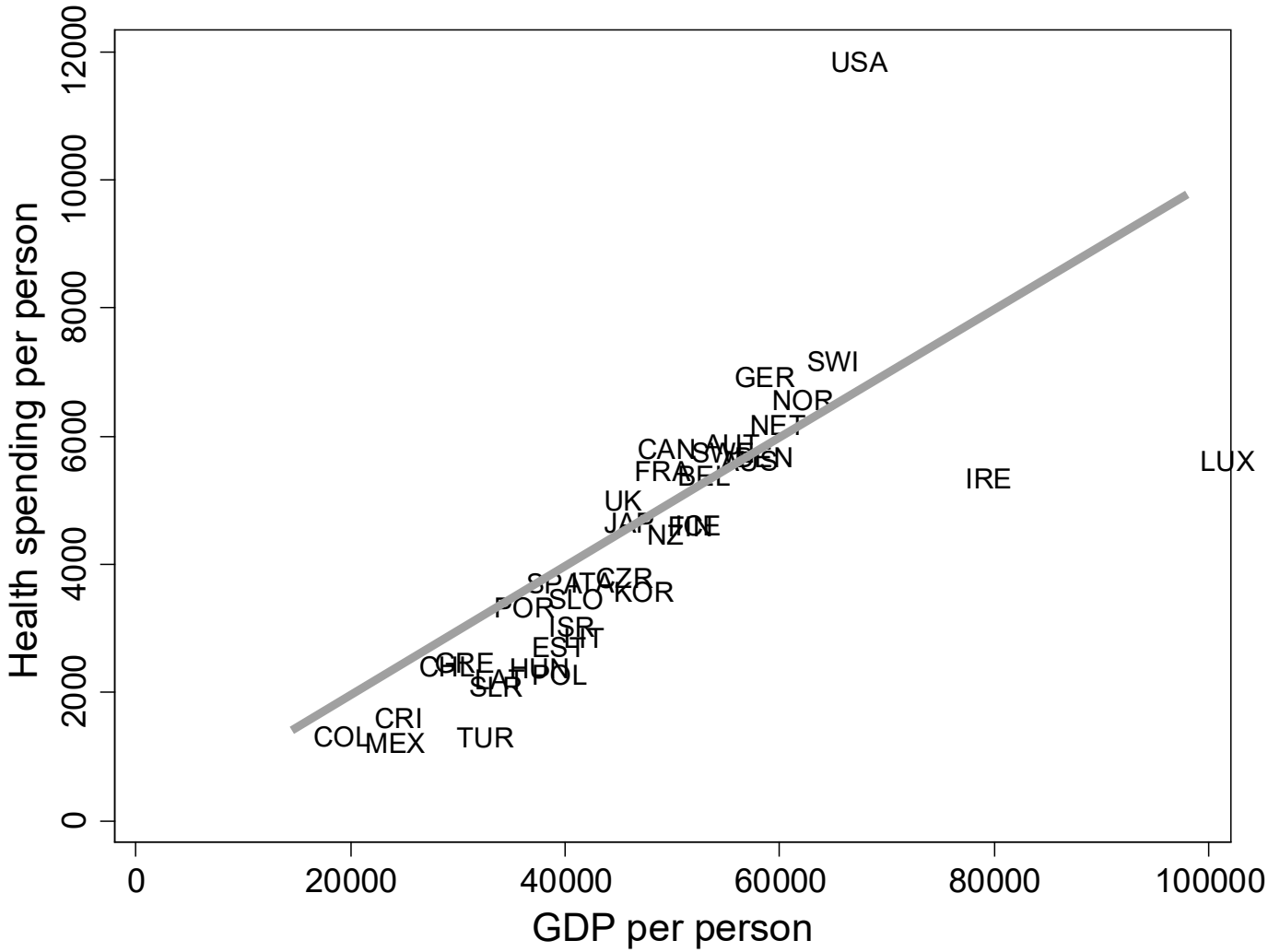
lifexp = life expectancy at birth (for males and females combined)

infant mortality = number of deaths in first year of life per one thousand live births.

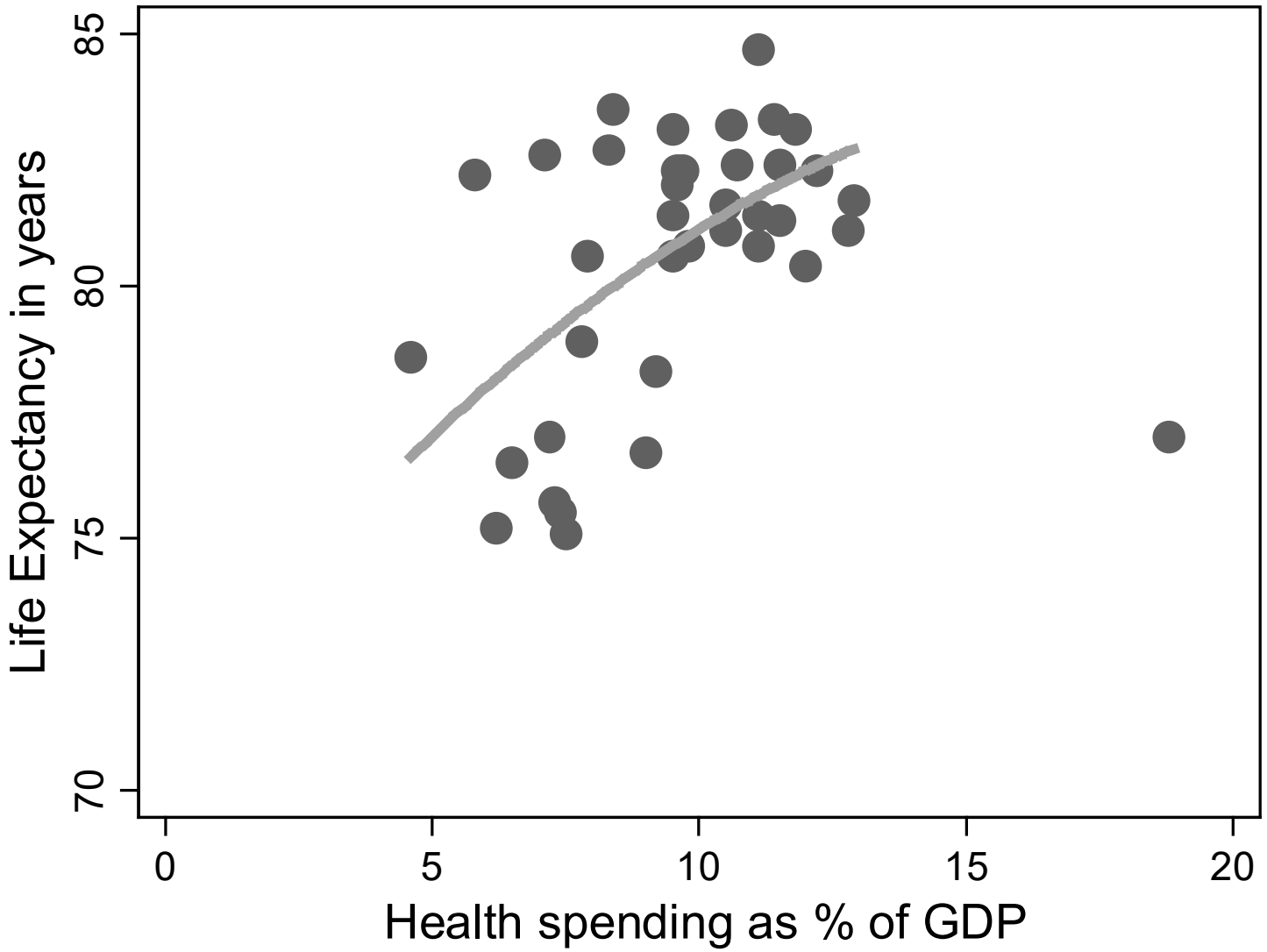
- Health spending rises as GDP rises (normal good)
- Health spending as % of GDP rises with income (superior good).



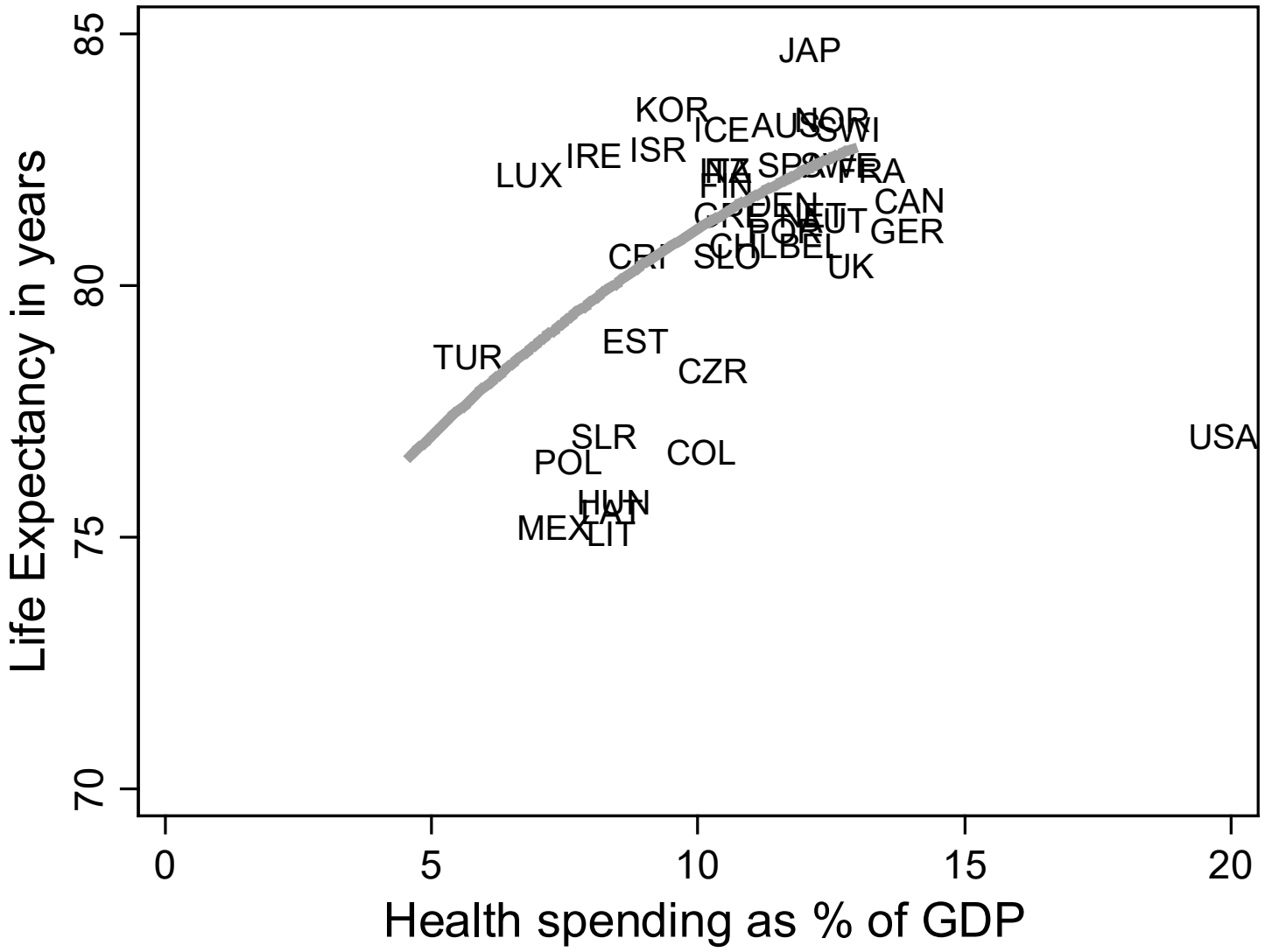
- USA spends much more than expected.



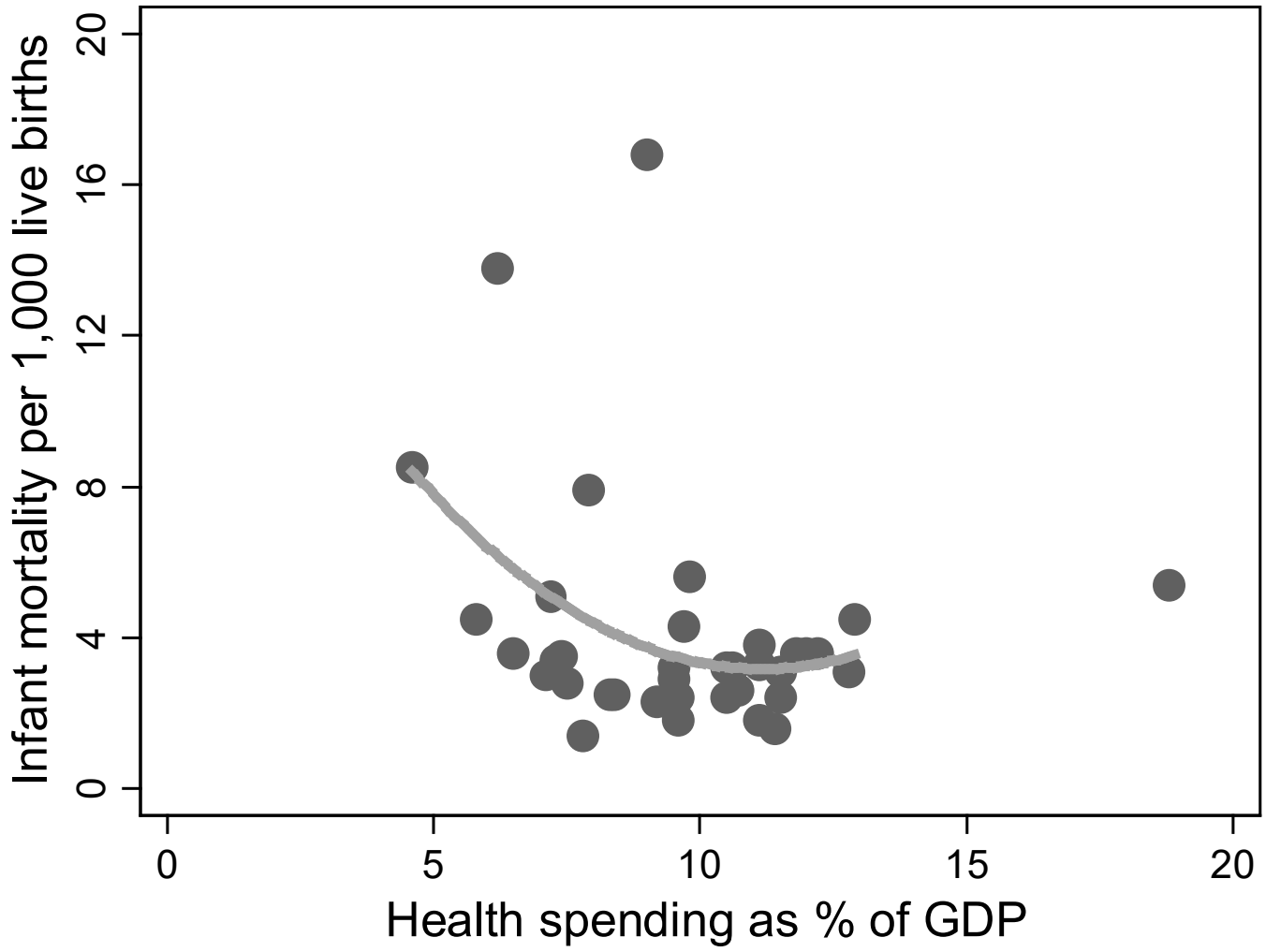
- Life expectancy increases with health spending as % of GDP.



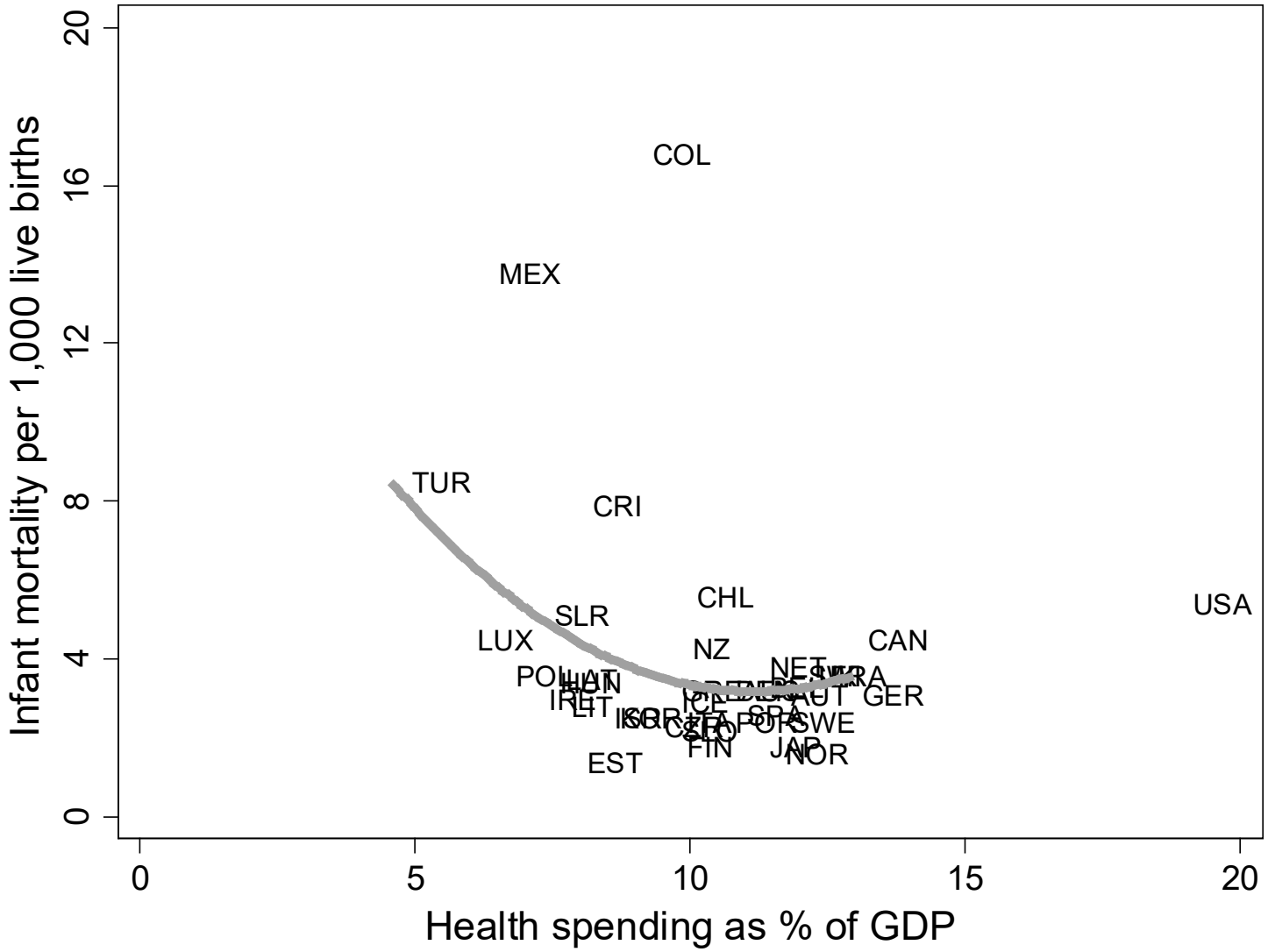
- U.S. life expectancy much lower than predicted by the line.



- Infant mortality decreases with health spending as % of GDP.



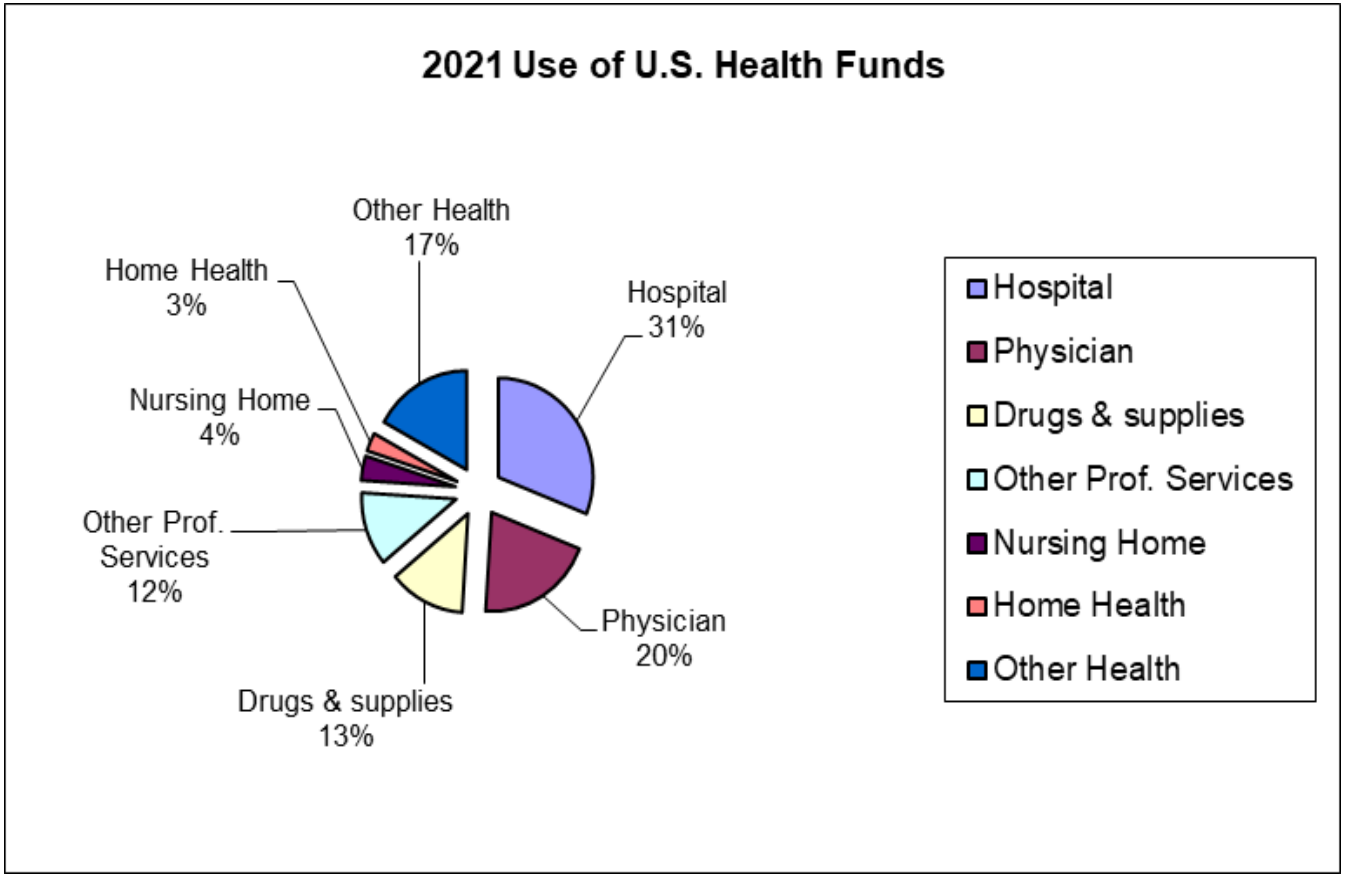
- U.S. infant mortality higher than predicted by the line.



A.5 Use and Source of U.S. Funds

A.5.1 Use of Funds in 2021

- 64% of funds are used in the big three:
  hospital care, physician services, and drugs and products.



Category	$/Capita	% of Total	
Hospital Care	4000	31	
Physician and Clinical	2600	20	
Prescription Drugs & Supplies	1600	13	[Drugs 10%]
Other Professional	1600	12	[Dental 4%]
Nursing Home Care	500	4	
Home Health Care	400	3	
Admin Costs & net cost ins.	900	7	
Public Health	600	4	
Research (non-commercial)	200	1	
Structures and equipment	400	3	
Total	12900	100	

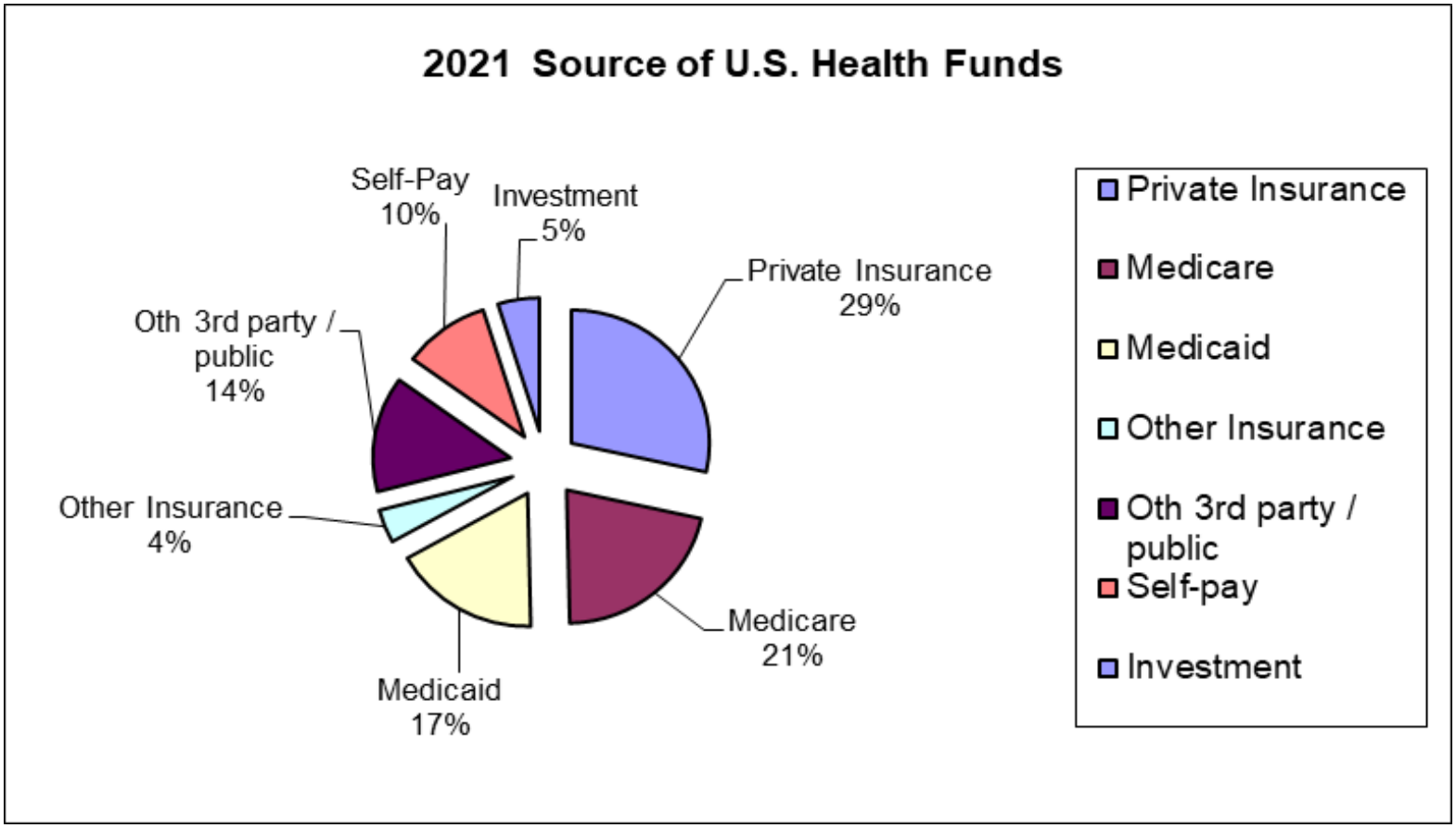
Health care professionals 13.0 million (9.3% of the workforce)

(Source: https://www.bls.gov/oes/tables.htm Feb 2021)

- 8.6 million practioners and technical + 6.4 million support
  Includes 1,000,000 physicians; 3,350,000 registered nurses

A.5.2 Source of Funds in 2021

- Approx. 50% public (mostly Medicare/Medicaid)
  Approx. 50% private (mostly private health insurance).
- Most through insurance (only 10% is self-pay / out of pocket).



Category	$/Capita	% of Total
Private Insurance	3700	29
Medicare	2700	21
Medicaid	2200	17
Other Insurance	500	4
Oth 3rd party & public	1800	14
Self (out-of-pocket)	1300	10
Investment	600	5
Total	12900	100

- Favorable tax treatment increases health costs to government.

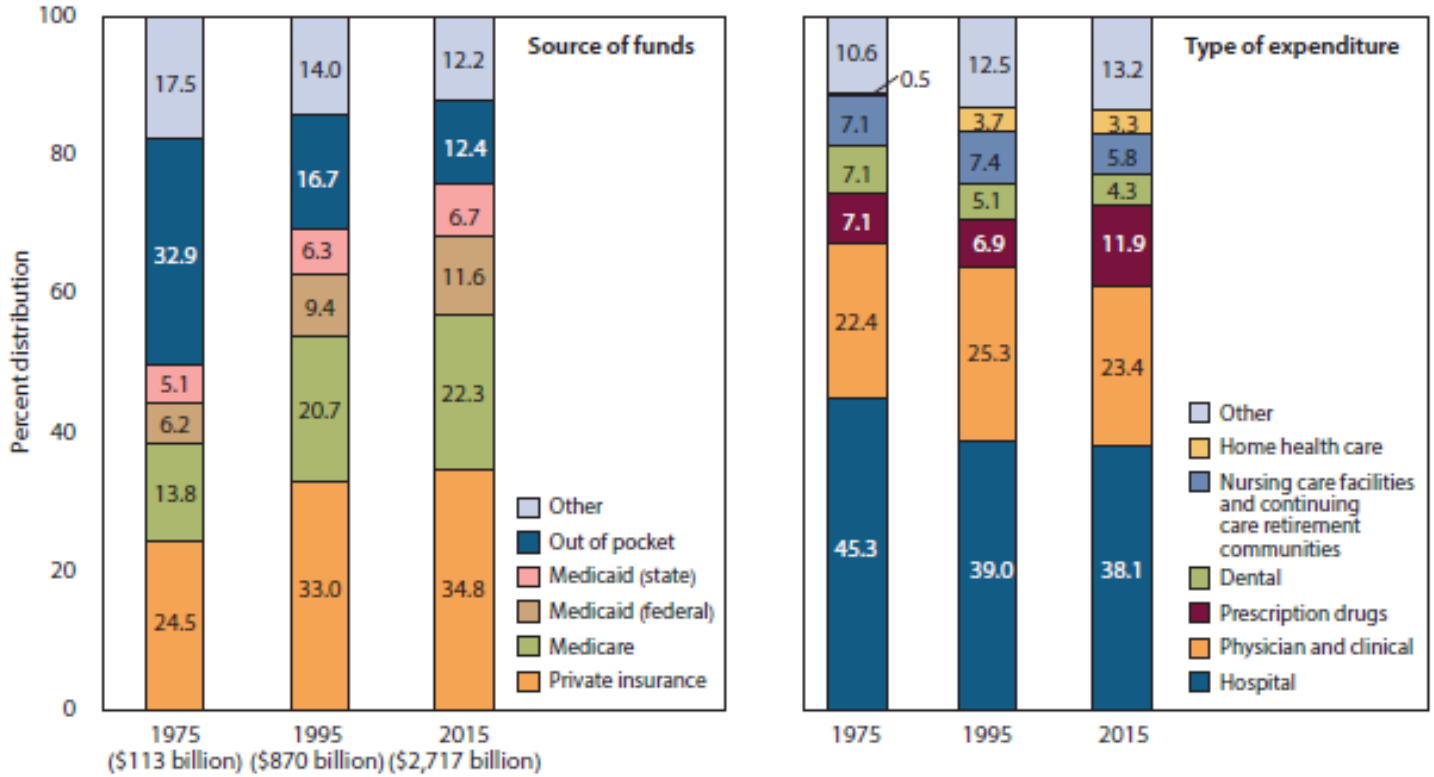
- Tax Subsidy due to employee health insurance not being treated as taxable income is > $500 per capita.

- Medicare in theory is funded fully by payroll tax and insurance premia, but in practice it is also funded out of general revenue.

A.5.3 Trends over past forty years

- Huge switch away from self-pay to health insurance.
- Much more spent on prescription drugs,
- Health care inflation is 2% above all items CPI since 1950.

Figure 23. Personal health care expenditures, by source of funds and type of expenditure: United States, 1975, 1995, and 2015

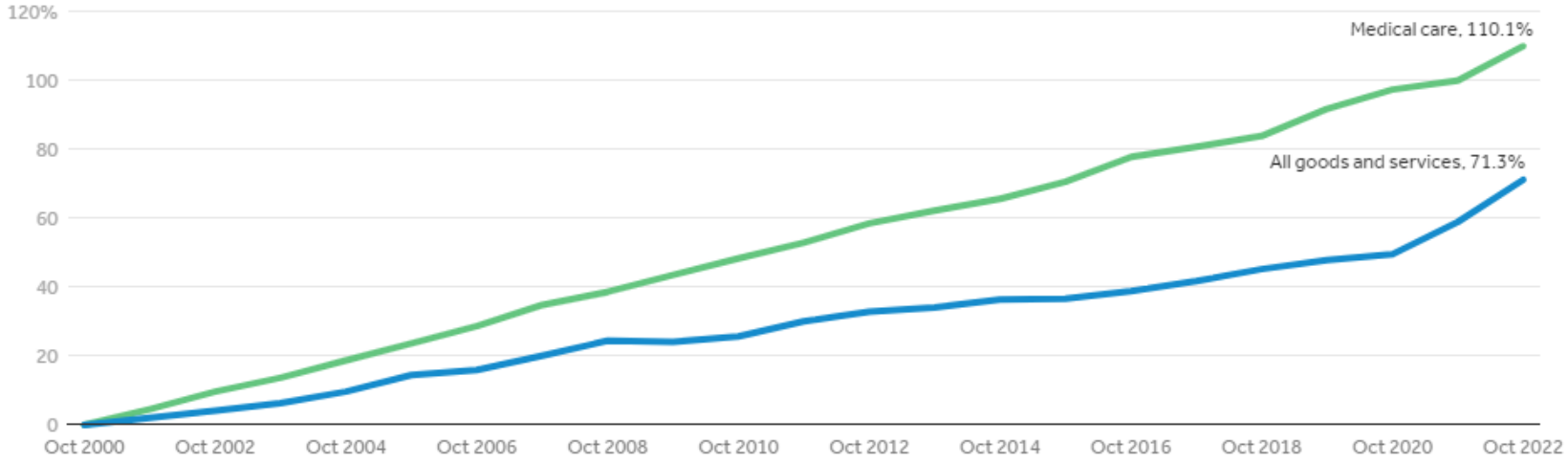


A.6 Timeline of Major Innovations in Health in the U.S.

- Late 1800's more scientific medical practice and education begins in Europe, especially Germany.
- 1880's Johns Hopkins Medical School established in U.S.
- 1910 Flexner Report leads to switch to scientific Medical Schools in the U.S. and licensing of doctors.
- 1930's Blue Cross established for hospital insurance.
  1930's Blue Shield established for medical insurance.
- 1965 Medicare established for people over age 65.
  1965 Medicaid established for needy people.
- 1990's movement to managed care, including health maintenance organizations (HMO).
- 2000's more managed care but less HMO's and more preferred provider organization (PPO).
- 2014 President Obama's health reforms fully implemented.
- 2020 Rapid development of Covid 19 vaccinations.

- Doctors can do much more over time & insurance gives access. So expect health as percentage of GDP to rise over time.
- But additionally prices are high.
- If Medical care inflation = Overall inflation since 2000 we would be spending 14.9% of GDP on health (not 18.3%).

Cumulative percent change in Consumer Price Index for All Urban Consumers (CPI-U) for medical care and for all goods and services, October 2000 - October 2022



Note: Medical care includes medical services as well as commodities such as equipment and drugs.

Source: KFF Analysis of Bureau of Labor Statistics (BLS) Consumer Price Index (CPI) data • Get the data • PNG

Peterson-KFF
Health System Tracker

A.7 U.S. Health Care System Characteristics

- Private health insurance markets have a big role
  - versus e.g. Britain's National Health Service
- Public health insurance also exists
  - Medicare (for elderly) and Medicaid (for poor).
- Health services are provided by private providers
  - versus salaried doctors paid by government.
- Not everyone has health insurance
  - roughly 10% uninsured (9% uninsured for the entire year)
  - recent substantial decrease due to Obamacare.
- Patients have more choice in treatment and who they are treated by than in many other western countries.

A.8 Current Issues

- Covid-19 Pandemic: led to 9.7% increase in 2020 to $4.1 trillion and 19.7% of GDP due to 36% increase in federal expenditures.
- Affordability: Continuous increase in real health prices and real health insurance premia.
- New technology: Improves quality but increases costs.
- Access: Around 10-11% of population uninsured for a full year.
- Quality: Viewed as high but increasingly questioned e.g. hospital deaths due to error.
- President Obama's health reforms enacted by Congress in 2010 (Patient Protection and Affordability Act) and (almost) fully implemented in 2014 are intended to address these issues.
- Despite political opposition "Obamacare'' continues and is actually more generous under new Biden administration.