

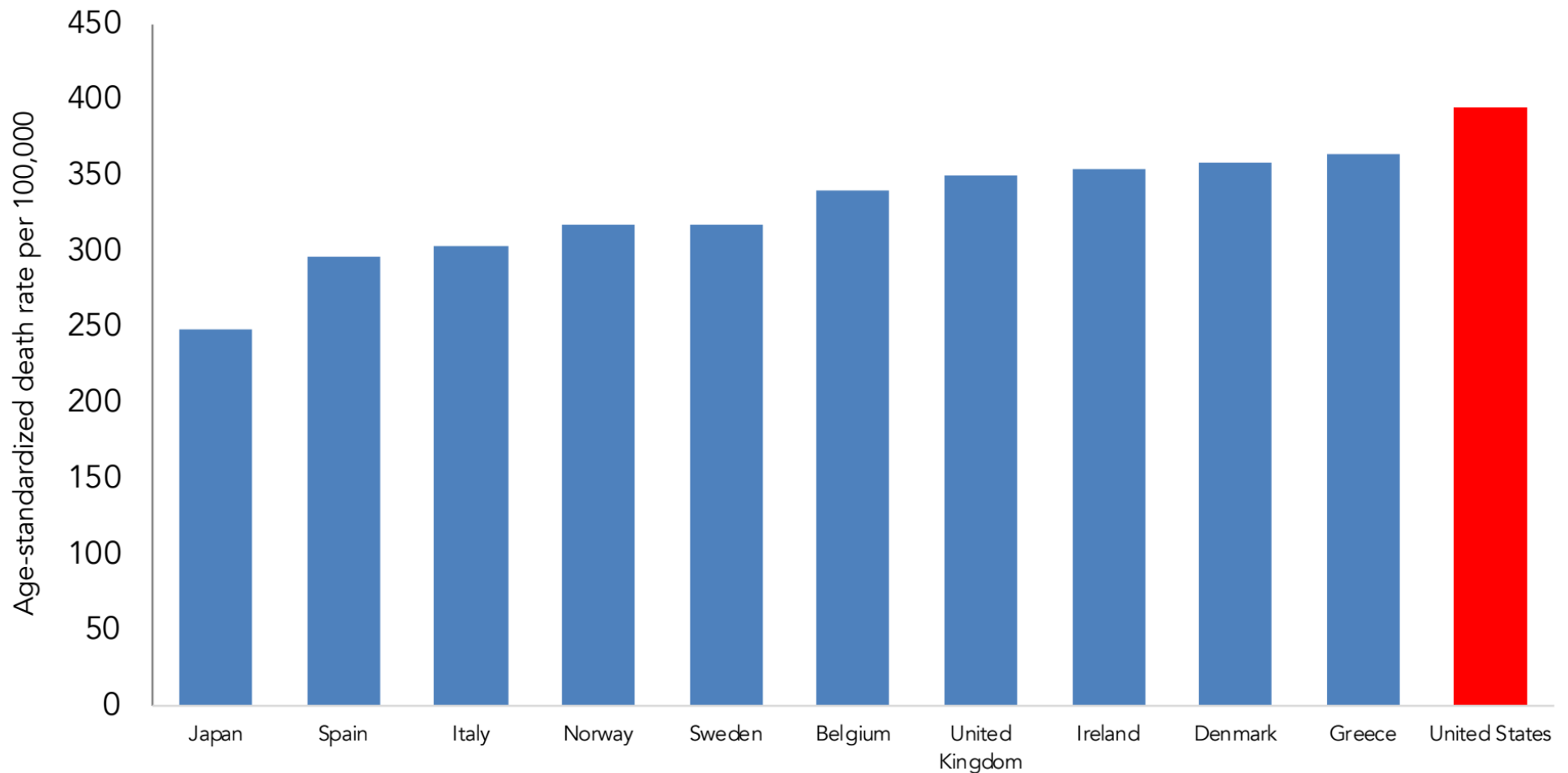
Aspiring to die healthy

On preventing disease and producing health

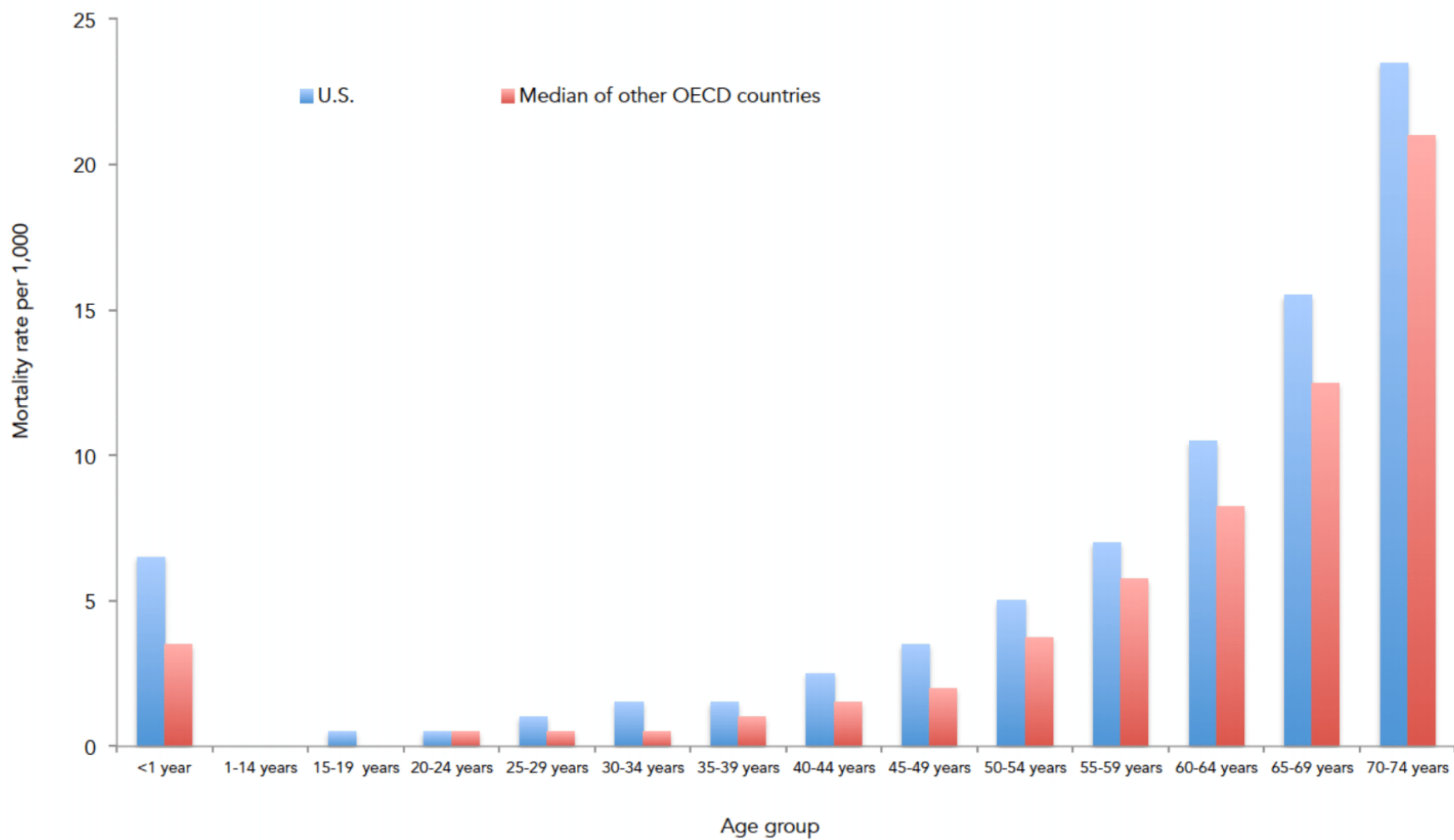
Sandro Galea

We all know the problem

Non-communicable diseases mortality rate in selected countries, 2015



U.S. vs. median mortality rates, age 0-75



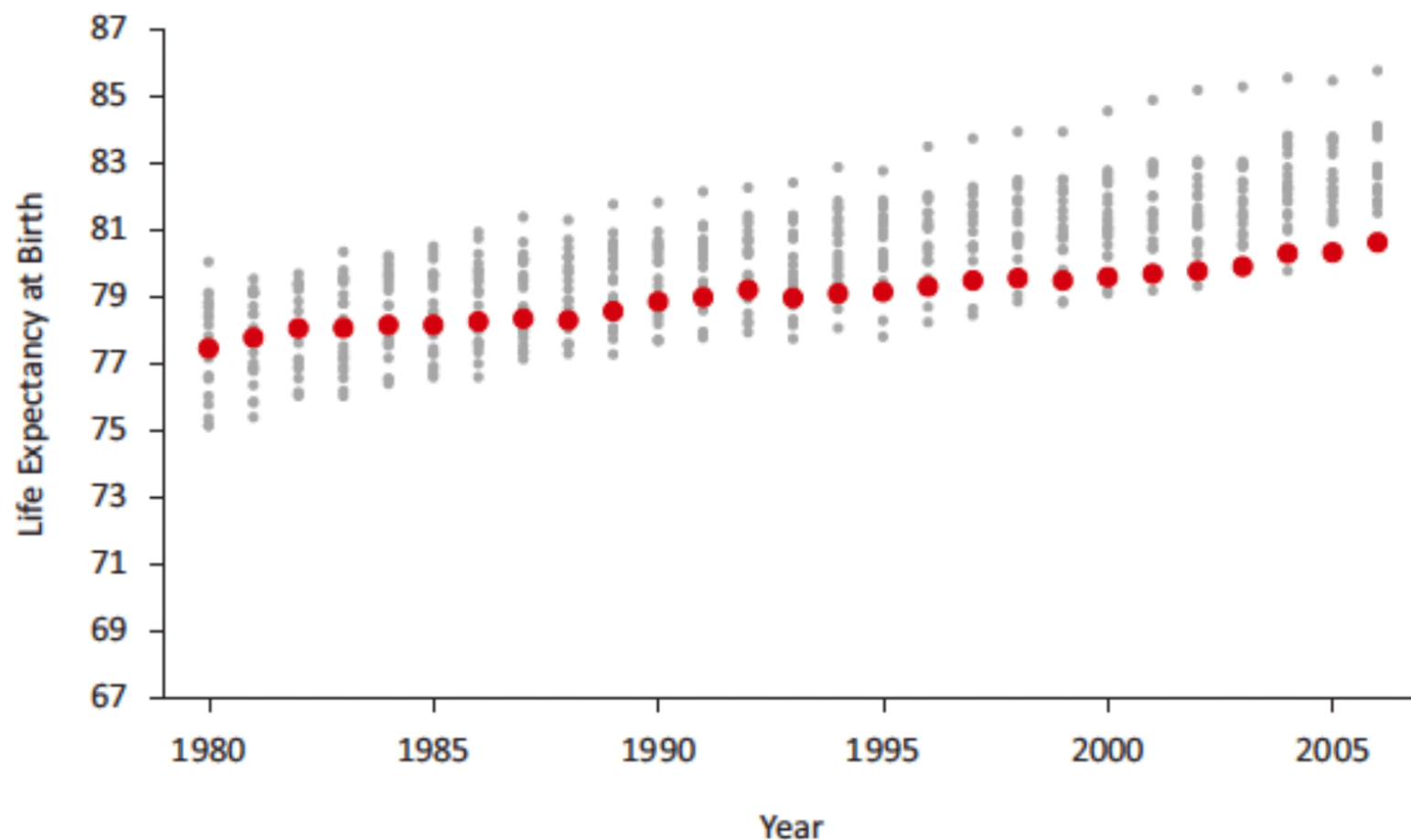
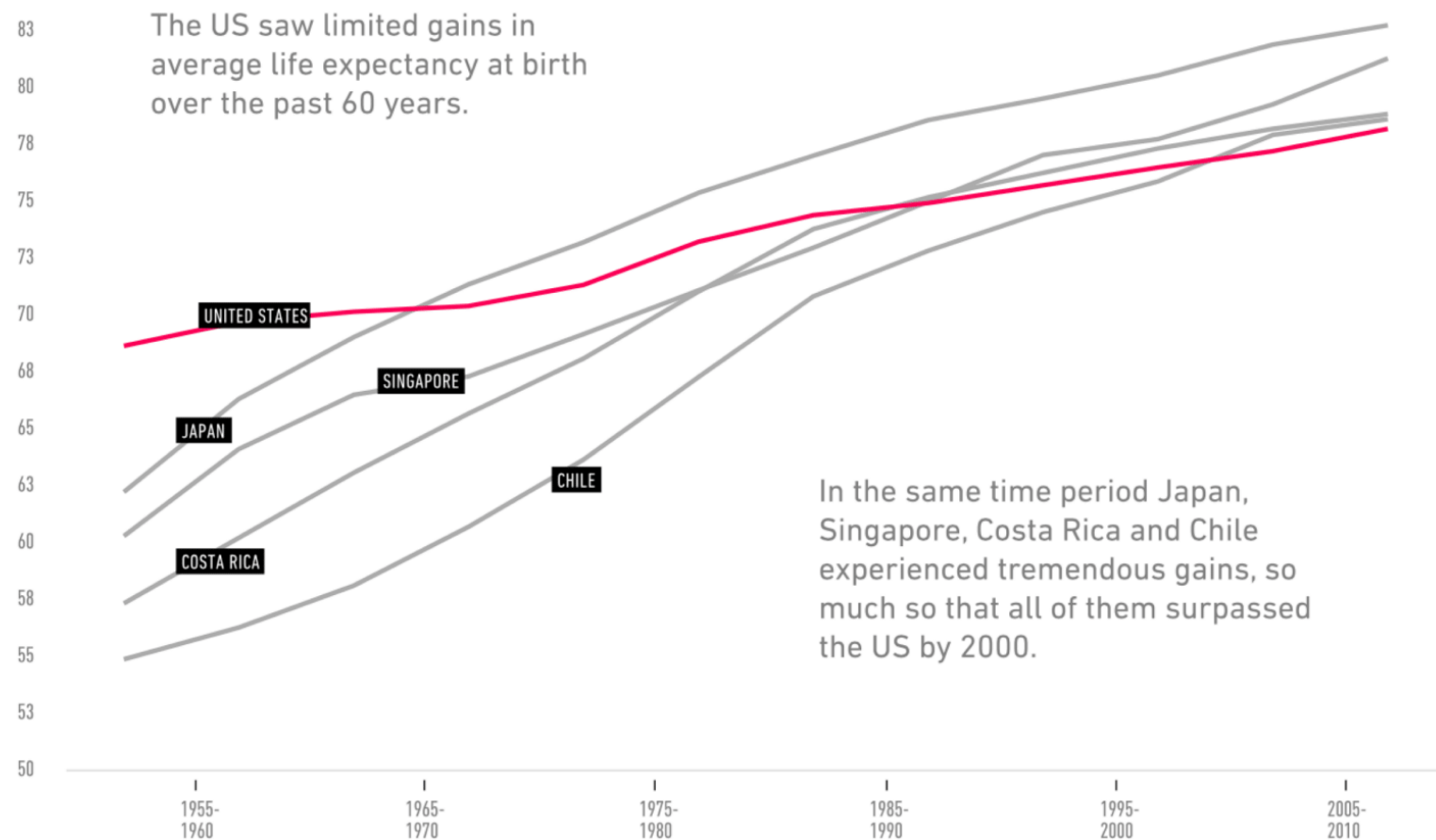


FIGURE 1-6 U.S. female life expectancy at birth relative to 21 other high-income countries, 1980-2006.

NOTES: Red circles depict newborn life expectancy in the United States. Grey circles depict life expectancy values for Australia, Austria, Belgium, Canada, Denmark, Finland, France, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and West Germany.

SOURCE: National Research Council (2011, Figure 1-4).

SURPASSING THE US IN LIFE EXPECTANCY



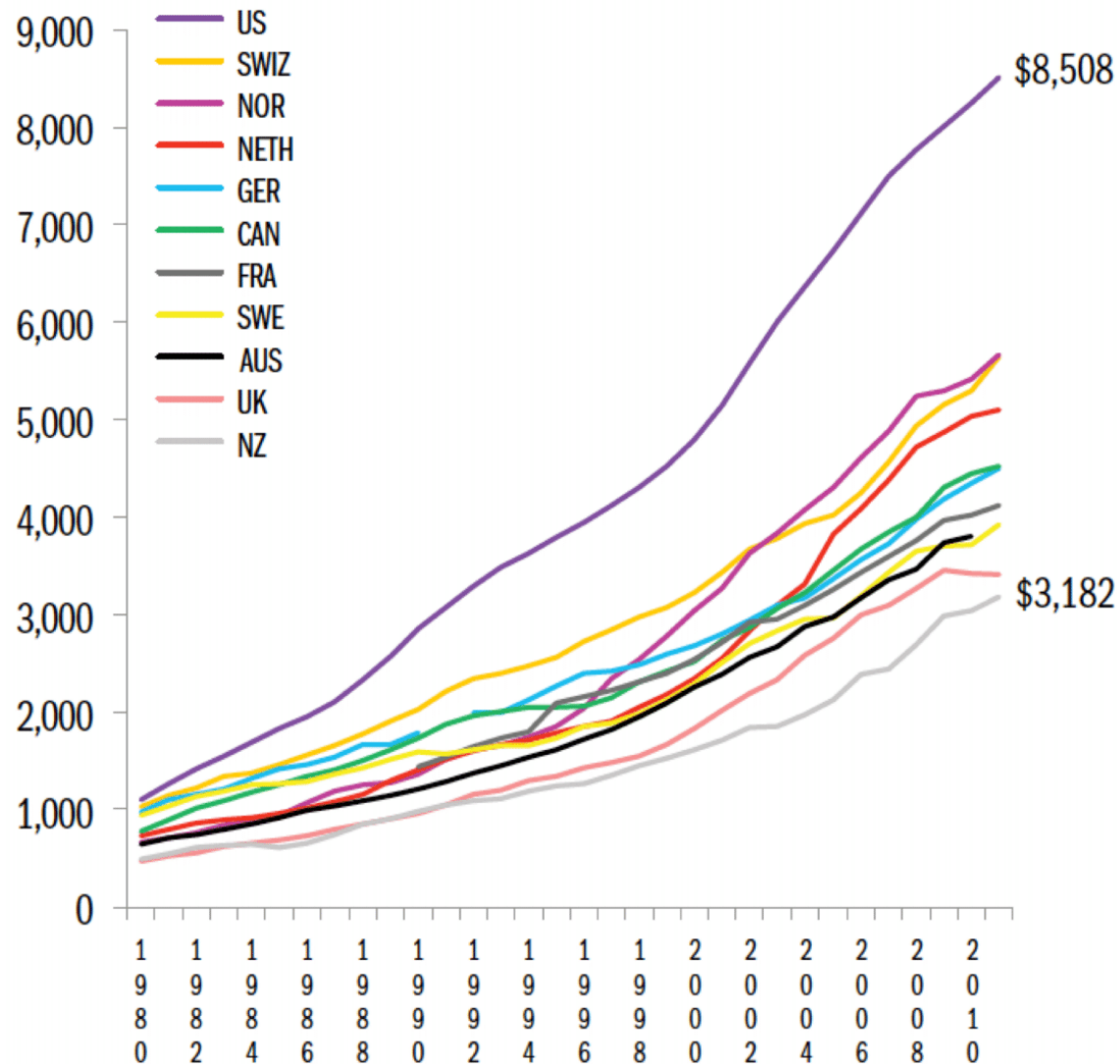
Author: GRAPH Team **Published:** December 11th, 2013

Tagged: life expectancy, high-income countries, oecd

DATA SOURCE: UNITED NATIONS, DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS, POPULATION DIVISION (2013). WORLD POPULATION PROSPECTS: THE 2012 REVISION, DVD EDITION.

Throwing money at the problem

Average spending on health per capita (\$US PPP)

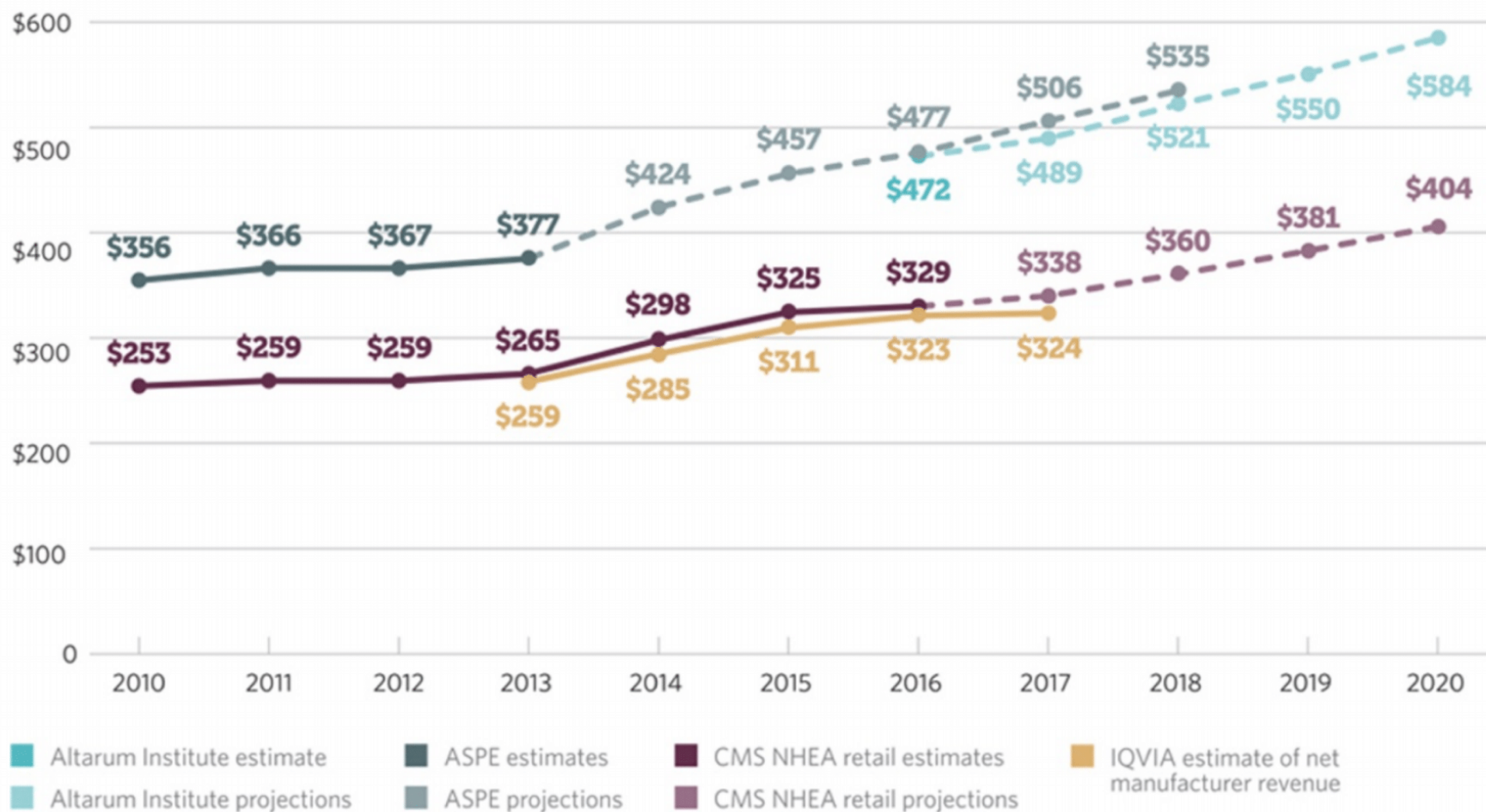


Note: \$US PPP = purchasing power parity.

Source: Organization for Economic Cooperation and Development, OECD Health Data, 2013 (Paris: OECD, Nov. 2013)

Figure 1

U.S. Prescription Drug Spending Estimates and Projections by Source, 2010-20



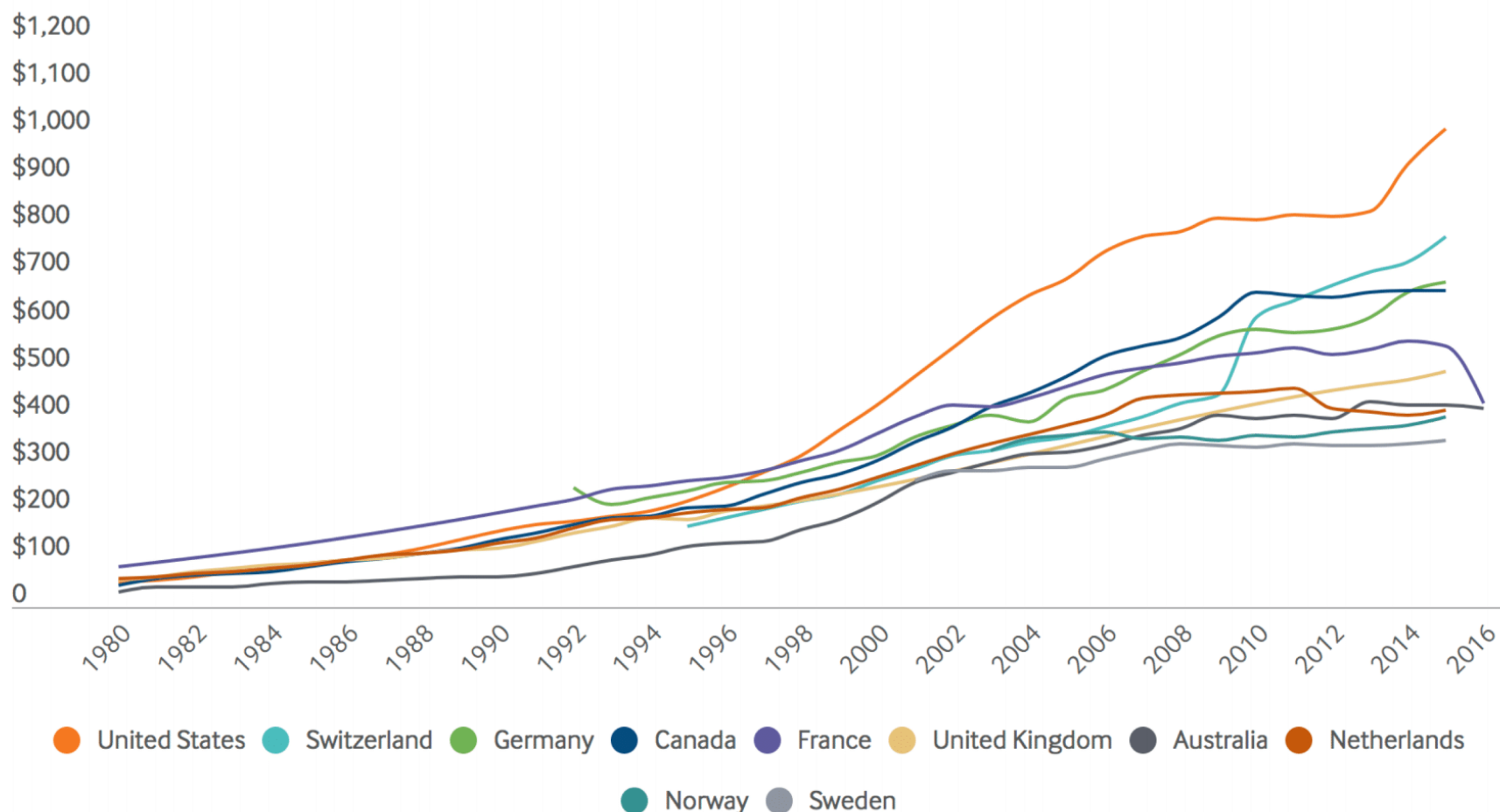
Note: Figures in the billions of dollars.

Sources: The Altarum Institute, Department of Health and Human Services' Office of the Assistant Secretary for Planning and Evaluation, the Centers for Medicare & Medicaid Services' National Health Expenditures Accounts, and IQVIA

© 2018 The Pew Charitable Trusts

Exhibit 1

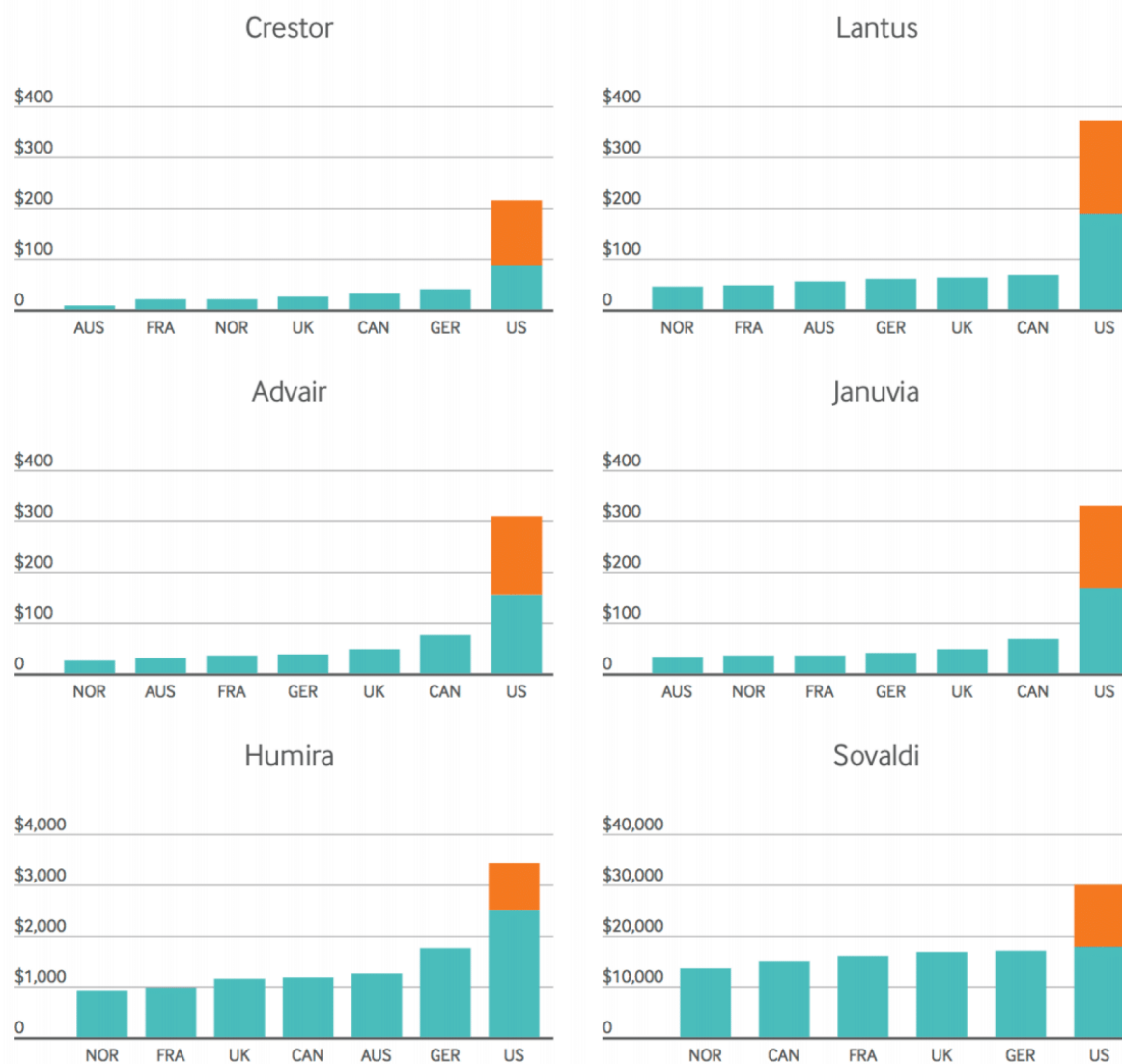
National Trends in Per Capita Pharmaceutical Spending, 1980–2015



Notes: Final expenditure on pharmaceuticals includes wholesale and retail margins and value-added tax. Total pharmaceutical spending refers in most countries to “net” spending, i.e., adjusted for possible rebates payable by manufacturers, wholesalers, or pharmacies. Data from all countries include only the portion spent on retail prescription medications, except for the Netherlands and the United Kingdom, where spending on pharmaceuticals includes prescribed medicines, over-the-counter medications, and other medical nondurable goods. Pharmaceuticals consumed in hospitals and other health care settings are excluded.

Data: Organisation for Economic Co-operation and Development, 2017. Data for Australia and Canada from 2014.

Monthly Price of Six Top-Selling Prescription Drugs



Note: Data not available for the Netherlands, Norway, or Sweden, nor for Australia in the case of Sovaldi.

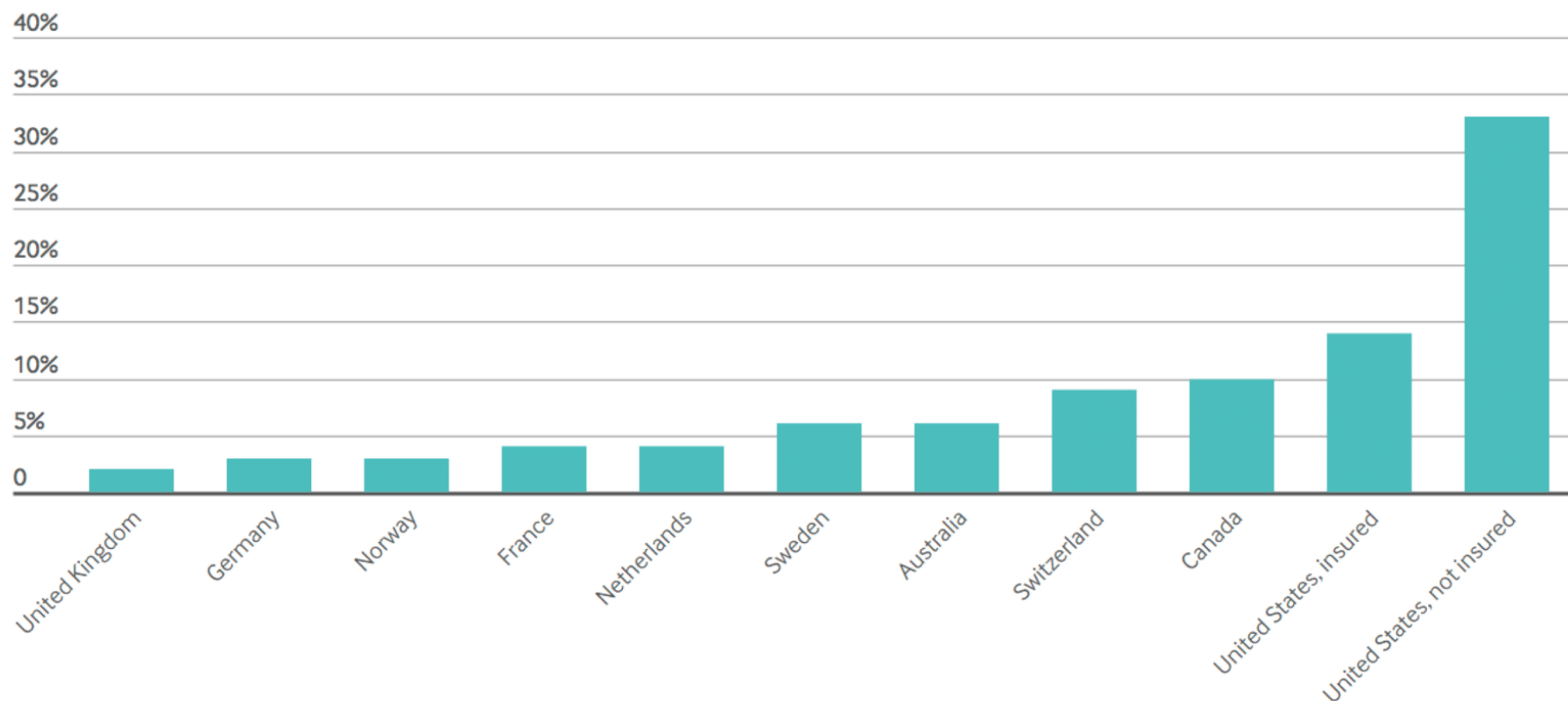
Data: R. Langreth, B. Migliozi, and K. Gokhale, "[The U.S. Pays a Lot More for Top Drugs Than Other Countries](#)," *Bloomberg*, Dec. 18, 2015.

Source: D. O. Sarnak, D. Squires, G. Kuzmak, and S. Bishop, "[Paying for Prescription Drugs Around the World: Why Is the U.S. an Outlier?](#)" The Commonwealth Fund, October 2017.

And yet, we are not succeeding

Exhibit 6

Adults Who Cited Cost as a Reason for Skipping Prescriptions or Doses, 2016

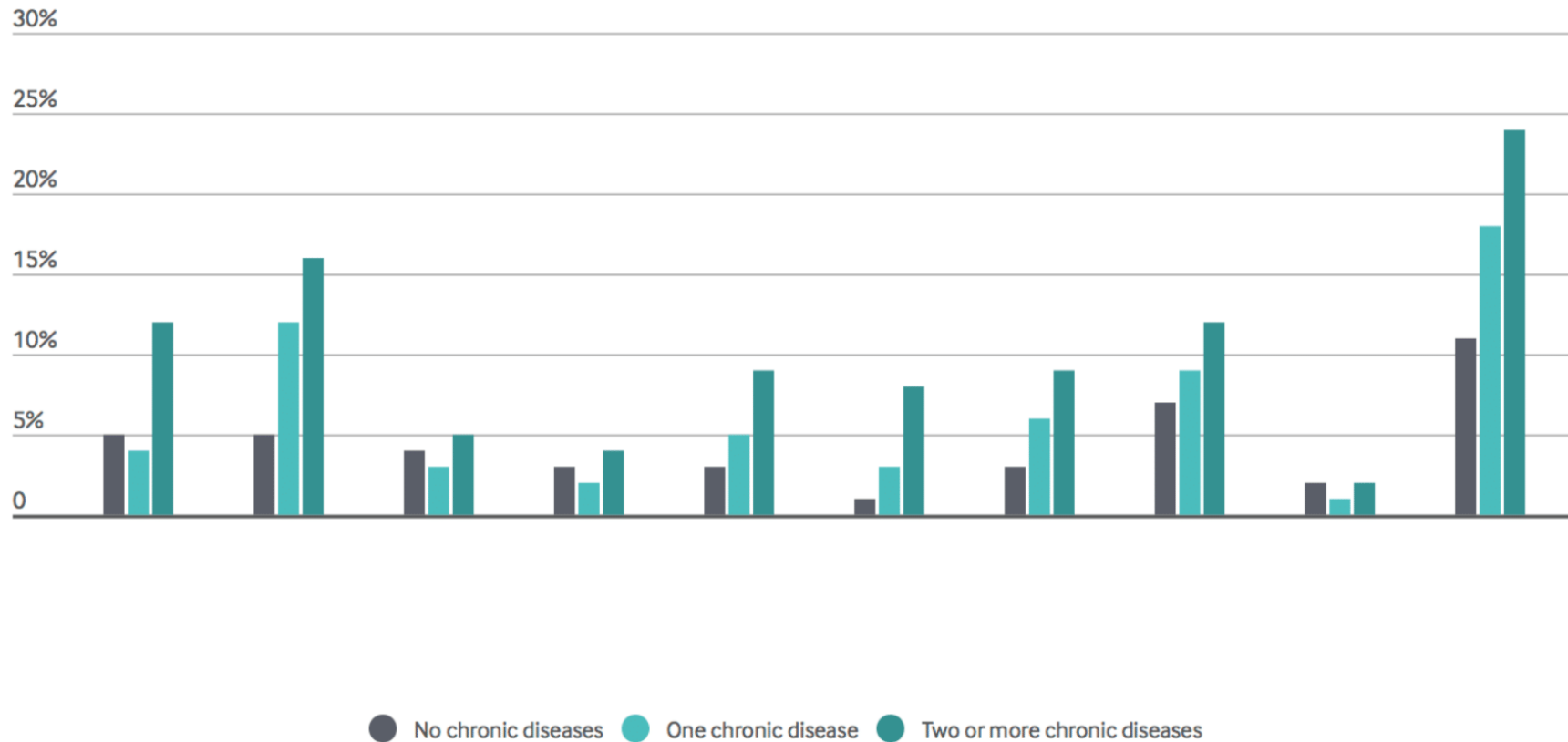


Data: 2016 Commonwealth Fund International Health Policy Survey of Adults in 11 Countries.

Source: D. O. Sarnak, D. Squires, G. Kuzmak, and S. Bishop, [*Paying for Prescription Drugs Around the World: Why Is the U.S. an Outlier?*](#) The Commonwealth Fund, October 2017.

Exhibit 7

Adults Who Cited Cost as a Reason for Skipping Prescriptions or Doses, by Health Status, 2016

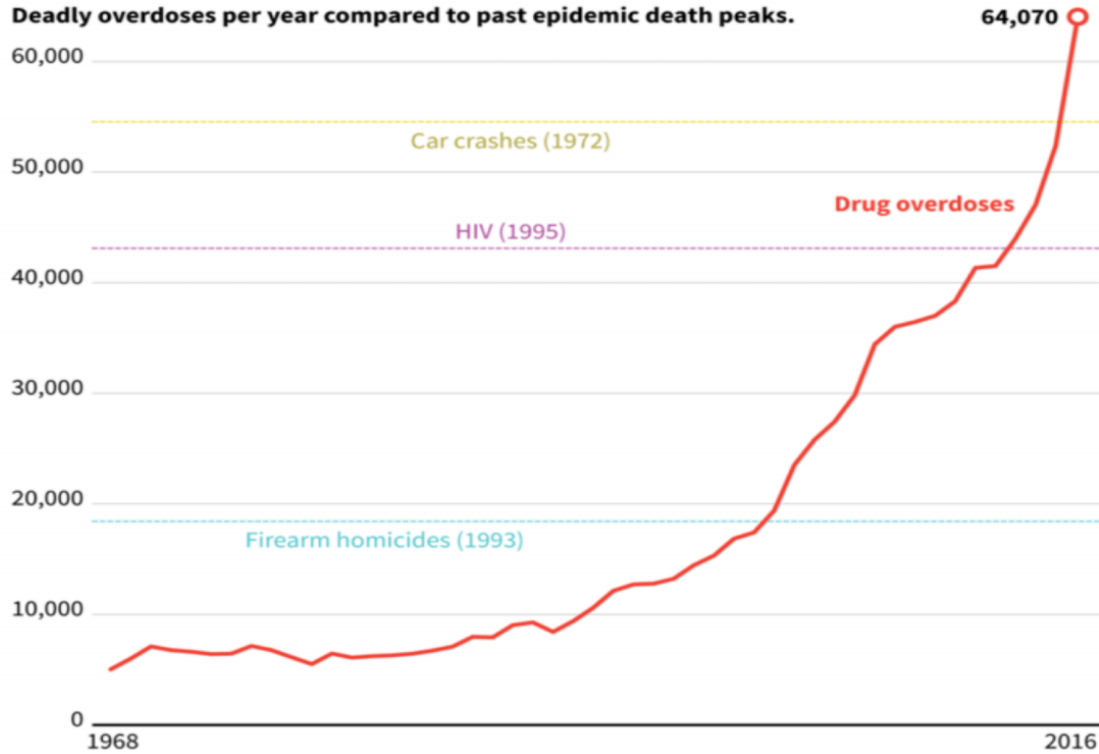


Data: 2016 Commonwealth Fund International Health Policy Survey of Adults in 11 Countries.

Source: D. O. Sarnak, D. Squires, G. Kuzmak, and S. Bishop, [Paying for Prescription Drugs Around the World: Why Is the U.S. an Outlier?](#) The Commonwealth Fund, October 2017.

Drug Overdose Deaths Are Outpacing Other Public Health Epidemics

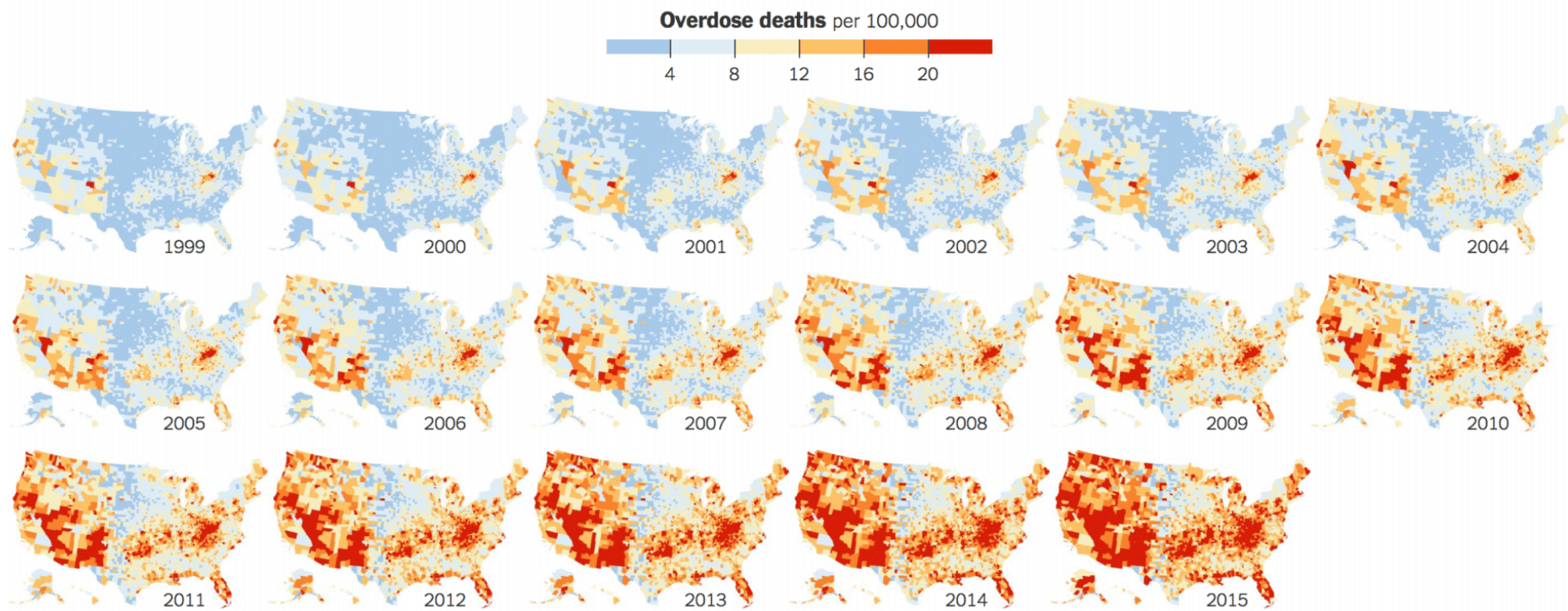
Deadly overdoses per year compared to past epidemic death peaks.



Source: CDC, NHTSA

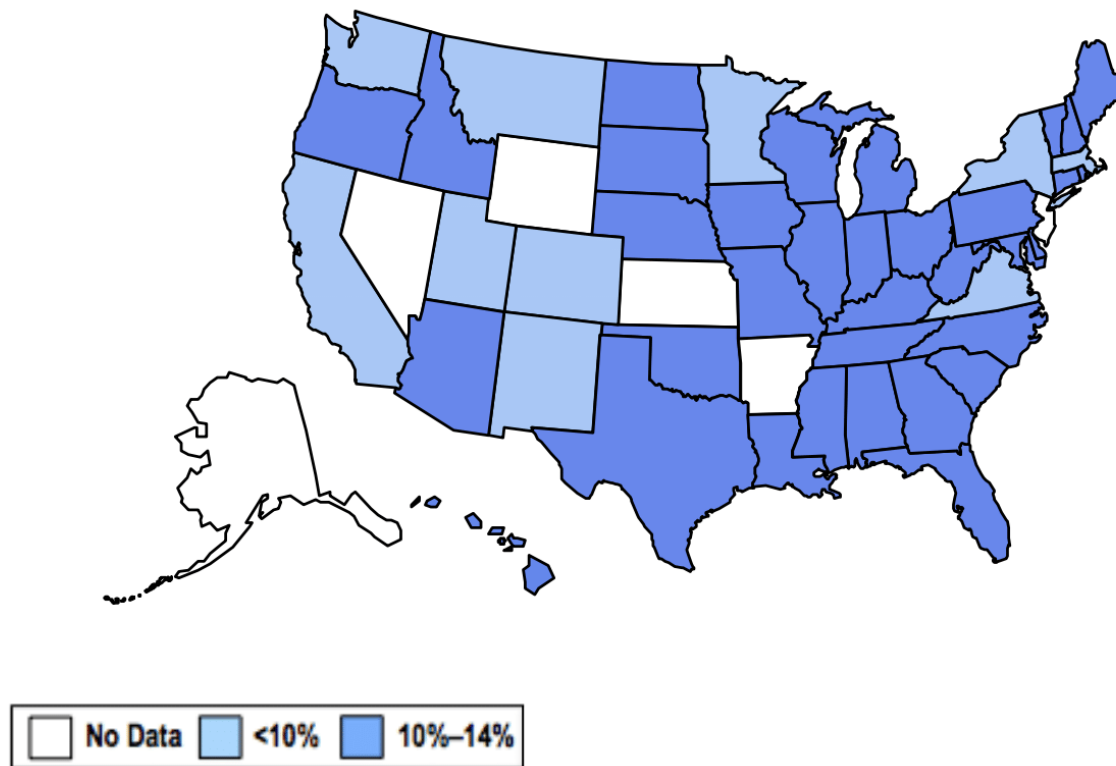
HuffPost

ALISSA SCHELLER/HUFFPOST



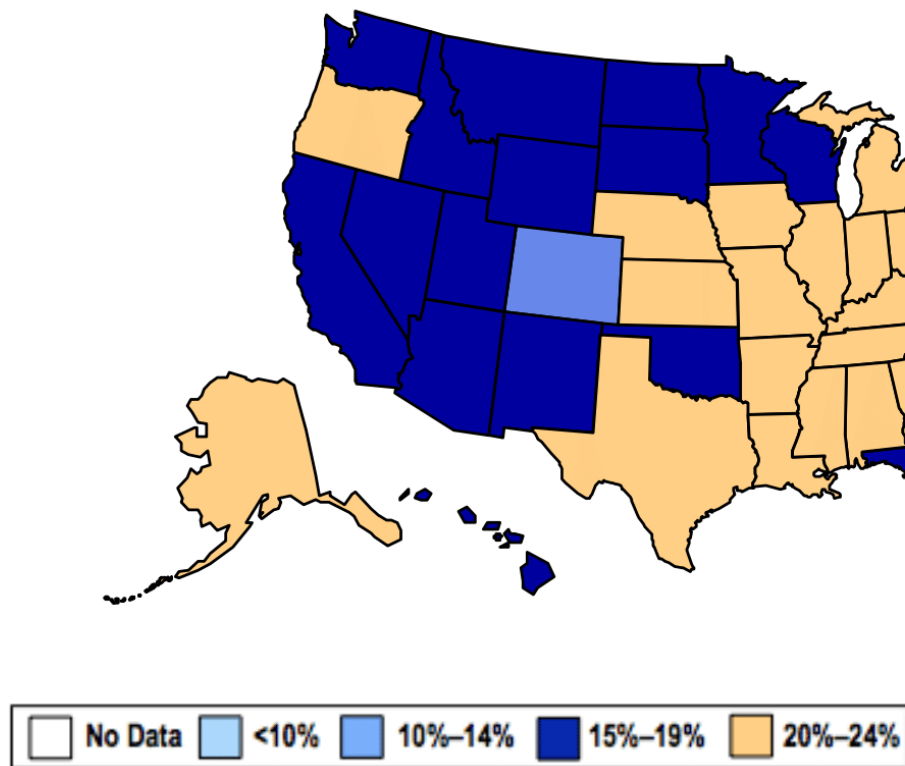
Obesity trends* among U.S. adults, 1990

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



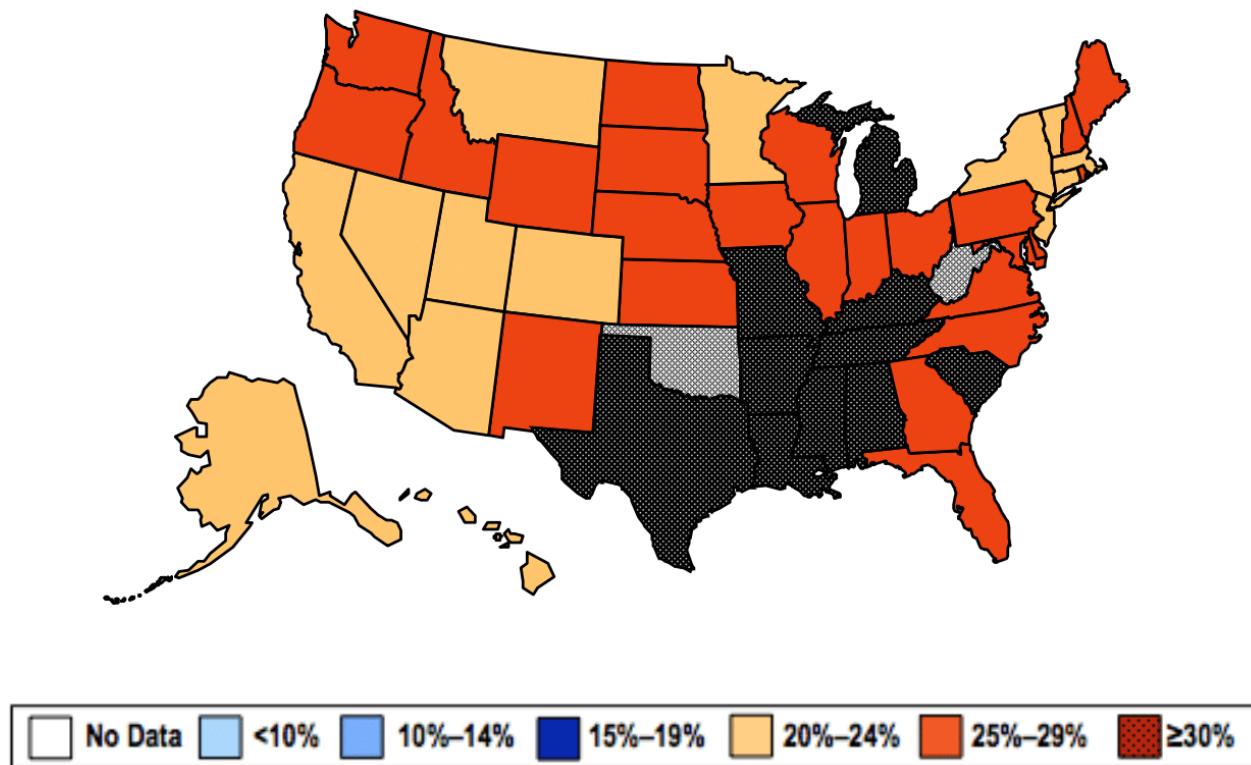
Obesity trends* among U.S. adults, 2000

(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Obesity trends* among U.S. adults, 2010

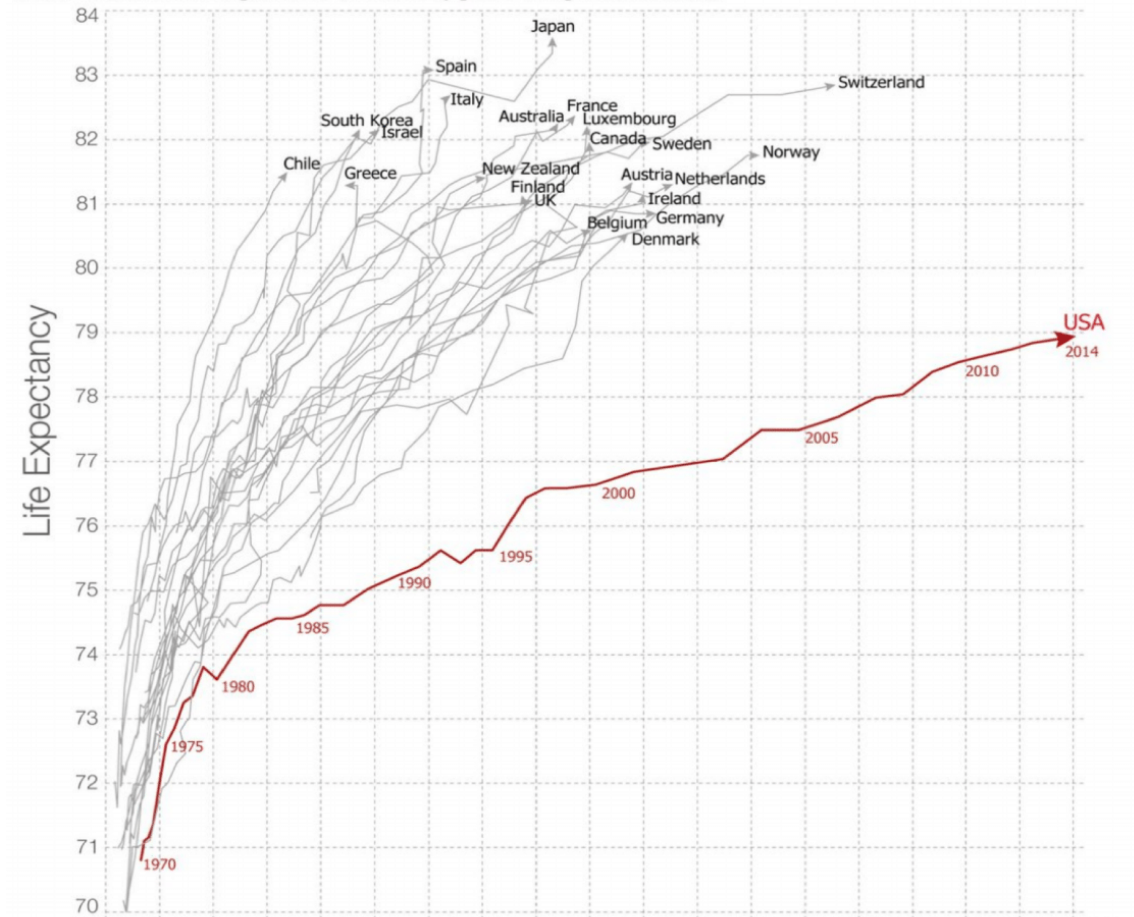
(*BMI ≥ 30 , or ~ 30 lbs. overweight for 5' 4" person)



Life expectancy vs. health expenditure over time (1970-2014)

Our World
in Data

Health spending measures the consumption of health care goods and services, including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. Shown is total health expenditure (financed by public and private sources).

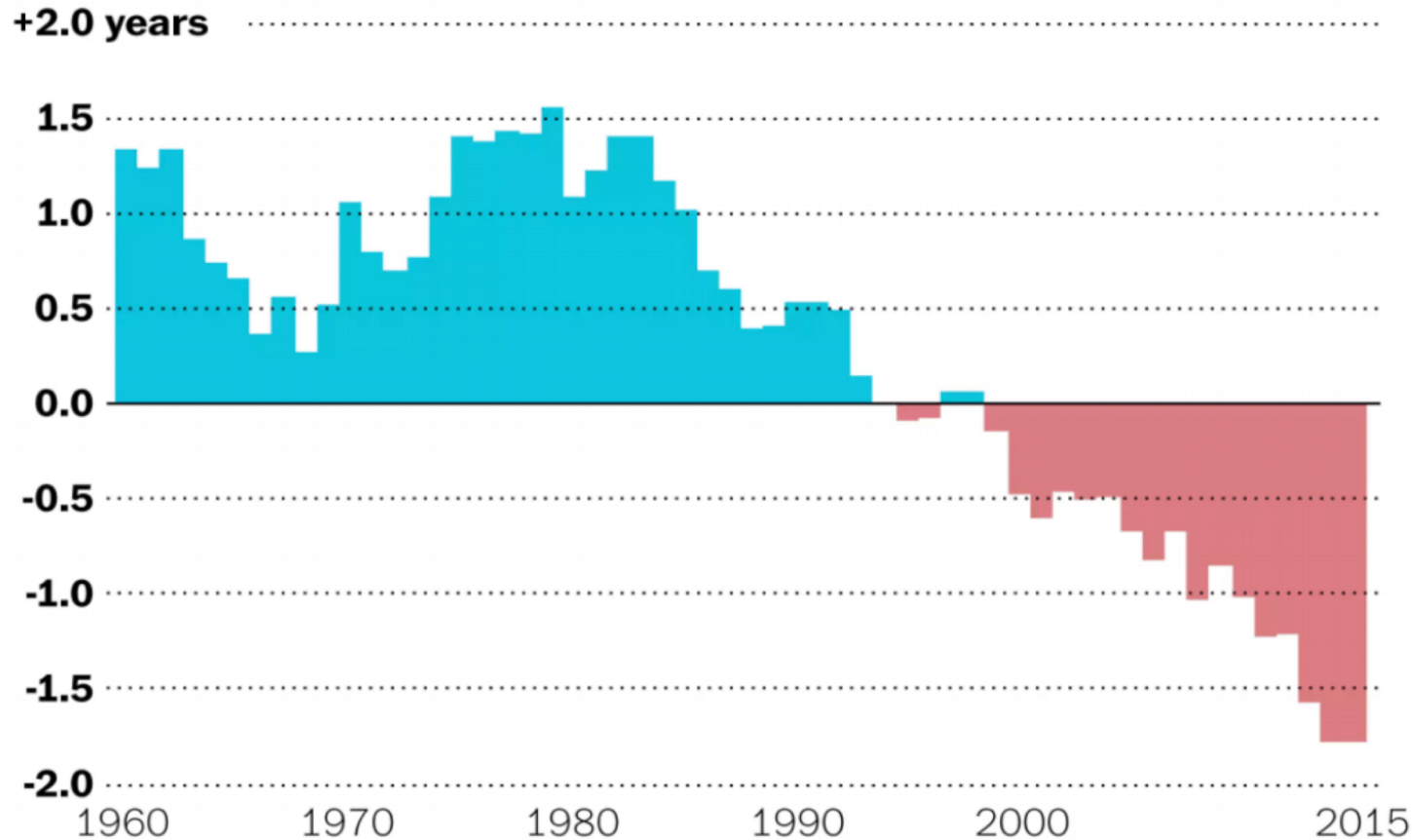


Our World in Data. "The link between health spending and life expectancy: The US is an outlier."

<<https://ourworldindata.org/the-link-between-life-expectancy-and-health-spending-us-focus>> Accessed September 7, 2016

American exceptionalism

Difference between average American life expectancy, and OECD average life expectancy, 1960–2015



WAPO.ST/**WONKBLOG**

Source: OECD, U.S. Census Bureau

Ingraham C. Americans are dying younger than people in other rich nations. *Washington Post*. December 27, 2017.

https://www.washingtonpost.com/news/wonk/wp/2017/12/27/americans-are-dying-younger-than-people-in-other-rich-nations/?utm_term=.d8ef8a27023a Accessed December

Not great, again

Life expectancy in America has declined for two years in a row

That's not really meant to happen in developed countries

HEALTH NEWS

AUGUST 22, 2018 / 3:41 PM / 2 MONTHS AGO

Life expectancy declines seen in U.S. and other high-income countries

What the dip in US life expectancy is really about: inequality

While poor Americans are dying earlier, the rich are enjoying unprecedented longevity.

By Julia Belluz | @juliaoftoronto | julia.belluz@voxmedia.com | Jan 9, 2018, 9:50am EST

Dying younger: U.S. life expectancy 'a real problem'

John Bacon, USA TODAY

Published 8:40 a.m. ET Dec. 8, 2016 | Updated 3:21 p.m. ET Dec. 8, 2016

Health Science

Fueled by drug crisis, U.S. life expectancy declines for a second straight year

Our options



Advancing Innovation in Health Care

Formalized structures help leaders establish a culture that inspires innovation

September 27, 2017 | Peyman Zand

The wonder drug

A digital revolution in health care is speeding up

Telemedicine, predictive diagnostics, wearable sensors and a host of new apps will transform how people manage their health

Diagnostics Without Borders: Innovations in Telehealth

OPERATIONS

How the EMR Is Increasing Innovation and Creativity in Health Care

by A. James Bender and Robert S. Mecklenburg
OCTOBER 10, 2017

6,422 views | Apr 2, 2018, 09:00am

Health Care Innovation: Harnessing New Technologies To Benefit Patients



Sanjay Poonen CommunityVoice
Forbes Technology Council CommunityVoice ⓘ

Business Model Innovation for Inclusive Health Care Delivery at the Bottom of the Pyramid

Federica Angeli, Anand Kumar Jaiswal,

Or



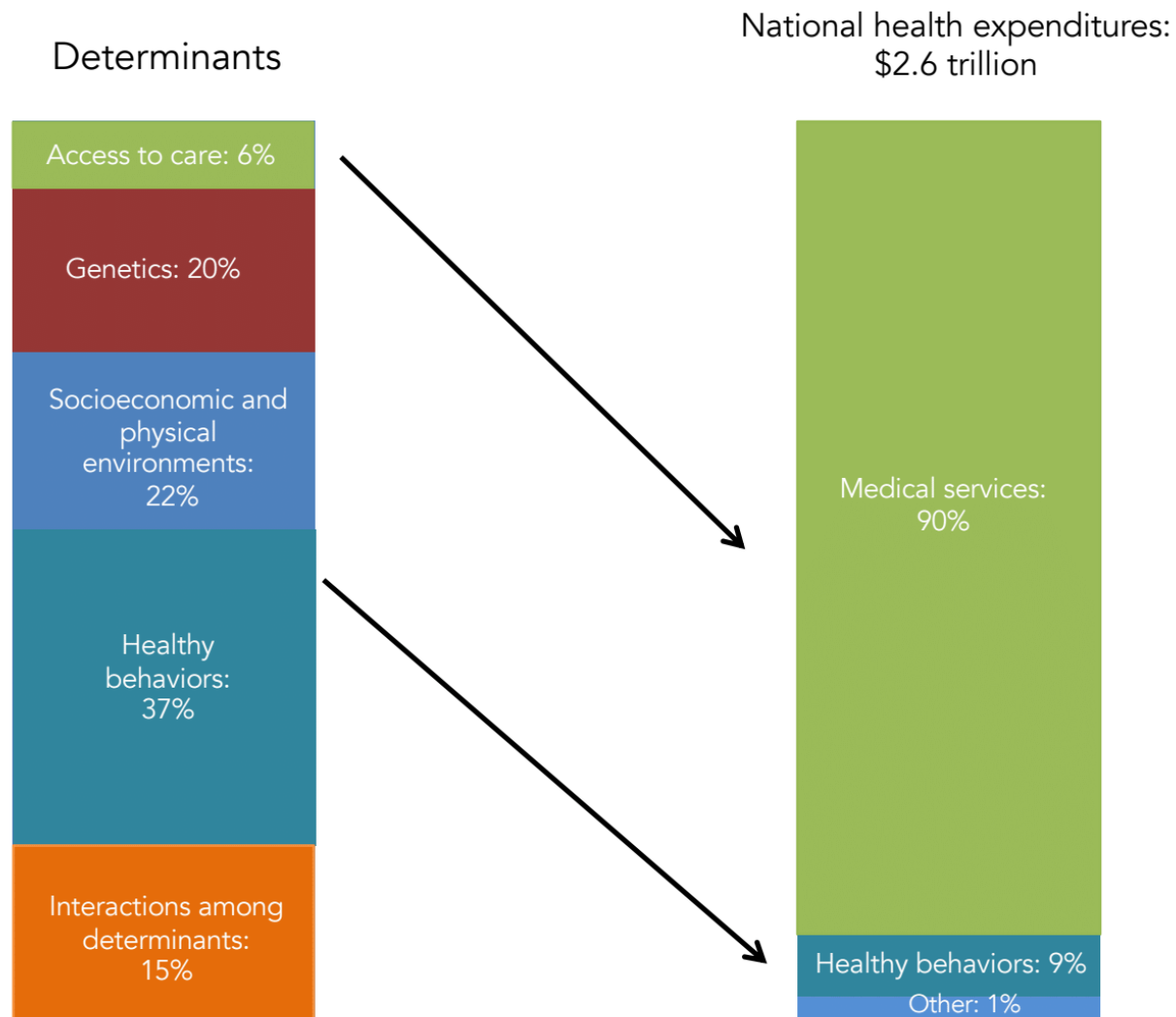
How do we create a healthier world?

1. Focus on health not healthcare



https://en.wikipedia.org/wiki/Blind_Willie_Johnson

The spending mismatch: Health determinants vs. health expenditures



"Healthy People/Healthy Economy: An Initiative to Make Massachusetts the National Leader in Health and Wellness." 2015. Data from NEHI 2013.

<<http://www.tbf.org/tbf/56/hphe/Health-Crisis>>

Tarlov A. Social determinants of health: the sociobiological translation. In: Blane D, Brunner E, Wilkinson R, editors. Health and social organization: towards a health policy for the 21st century. London: Routledge; 1996 pp. 71-93.

Bostonfoundation.org



National Center for Health Statistics

FastStats Homepage

Diseases and Conditions +

Infectious/Immune +

Family Life +

Health Care and Insurance +

Disability and Risk Factors +

Injuries +

Life Stages and Populations -

Age Groups +

Births +

Deaths -

Deaths and Mortality

Leading Causes of Death

Life Expectancy

Race and Ethnicity +

[CDC](#) > [NCHS Home](#) > [FastStats Homepage](#) > [Life Stages and Populations](#) > [Deaths](#) > [Leading Causes of Death](#)

Leading Causes of Death



Number of deaths for leading causes of death

- Heart disease: 633,842
 - Cancer: 595,930
 - Chronic lower respiratory diseases: 155,041
 - Accidents (unintentional injuries): 146,571
 - Stroke (cerebrovascular diseases): 140,323
 - Alzheimer's disease: 110,561
 - Diabetes: 79,535
 - Influenza and pneumonia: 57,062
 - Nephritis, nephrotic syndrome, and nephrosis: 49,959
 - Intentional self-harm (suicide): 44,193

Source: [Health United States, 2016 Table 19](#) [PDF- 11.1 MB] (Data are for 2015)

Releated FastStats

- [Deaths and mortality](#)

Actual causes of death in the United States in 1990 and 2000

Actual Cause	No. (%) in 1990	No. (%) in 2000
Tobacco	400 000 (19)	435 000 (18.1)
Poor diet and physical inactivity	300 000 (14)	365 000 (15.2)*
Alcohol consumption	100 000 (5)	85 000 (3.5)
Microbial agents	90 000 (4)	75 000 (3.1)
Toxic agents	60 000 (3)	55 000 (2.3)
Motor vehicles	25 000 (1)	43 000 (1.8)
Firearms	35 000 (2)	29 000 (1.2)
Sexual behavior	30 000 (1)	20 000 (0.8)
Illicit drug use	20 000 (<1)	17 000 (0.7)
Total	1 060 000 (50)	1 159 000 (48.2)

Deaths attributable to social factors

Social Factor	No. (%) in 2000
Individual-level factors	
Low education	193 626 (8.3)
Poverty	102 672 (4.4)
Low social support	179 937 (7.7)
Area-level factors	
Area-level poverty	39 553 (1.7)
Income inequality	145 388 (6.2)
Racial segregation	153 796 (6.6)

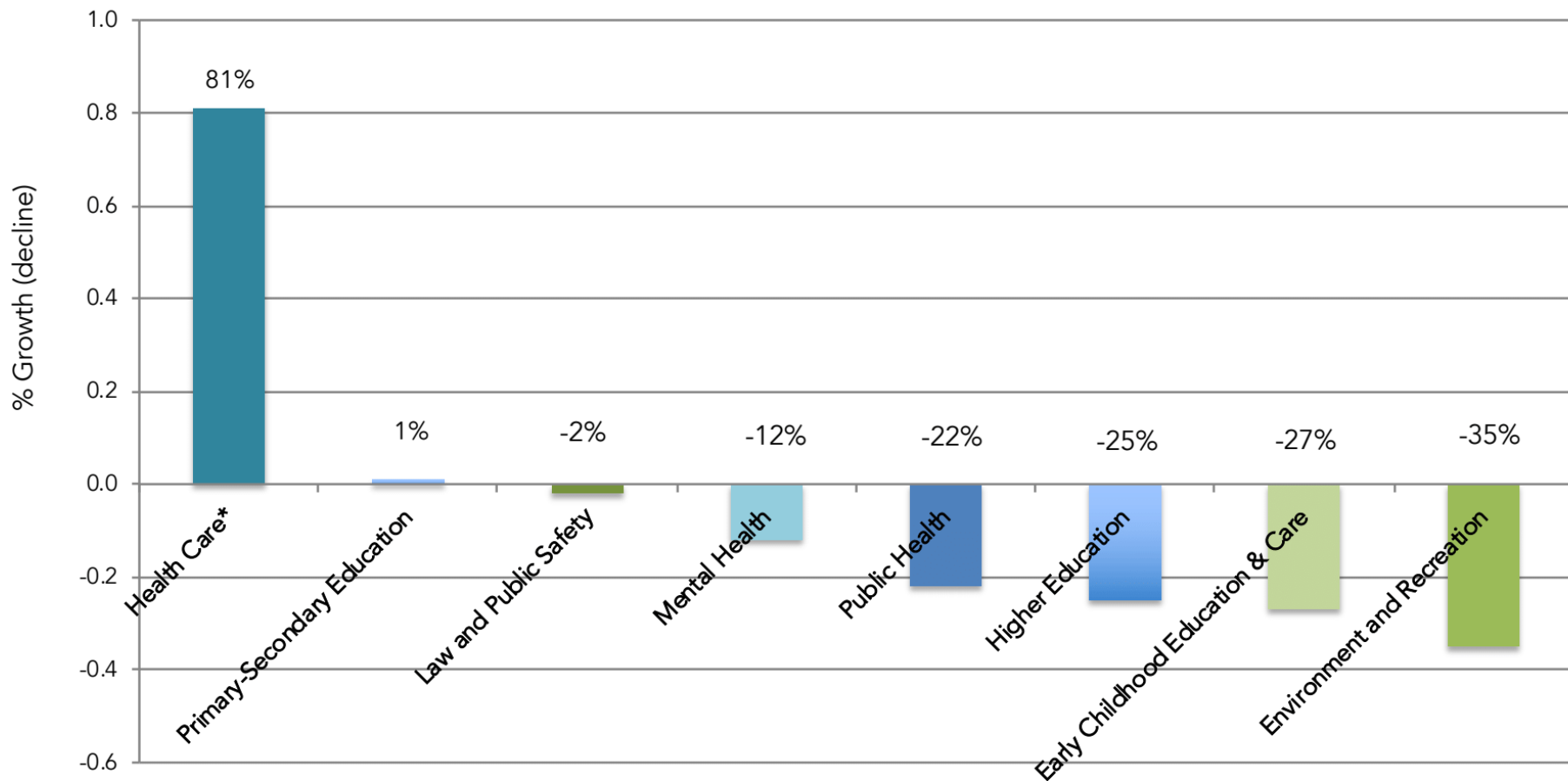
Comparing deaths from social factors to other causes

Social Factor	No. (%)	Cause of Death	No. (%)
Low education	193 626 (8.3)	Acute MI	192 898 (8.0)
Low social support	179 937 (7.7)	Stroke	167 661 (7.0)
Racial segregation	153 796 (6.6)	Lung cancer	155 521 (6.5)
Income inequality	145 388 (6.2)	Chronic lower resp. dis.	122 009 (5.1)
Poverty	102 672 (4.4)	Unintentional injuries	97 900 (4.1)
Area-level poverty	39 553 (1.7)	Renal failure	36 471 (1.5)

Minino et al. Deaths: Final data for 2000. Natl Vital Stat Rep. 2002; 50: 1-120.

Galea S, Tracy M, Hoggatt KJ, DiMaggio C, Karpati A. Estimated deaths attributable to social factors in the United States. American Journal of Public Health. 2011;101(8):1456-65. PMID: 21680937.

Change in Massachusetts State Government spending, FY01-FY14, adjusted for inflation



* Health care expenditure is Group Insurance Commission spending plus MassHealth (Medicaid)

2. Demand health from our politics





<https://gephardtaily.com/national-international/arlington-national-cemetery-closes-after-bomb-threat/>

www.nationalservice

The New York Times

Monday, October 2, 2017 | Today's Paper | Video | 77°F | Shanghai +0.29% ↑

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Style Food Travel Magazine T Magazine Real Estate ALL

ARSENAL FOUND IN LAS VEGAS GUNMAN'S ROOM AS DEATH TOLL GROWS TO 59; MORE THAN 520 HURT

Suspect Found Dead After One of Worst U.S. Mass Shootings

By THE NEW YORK TIMES
7:12 PM ET

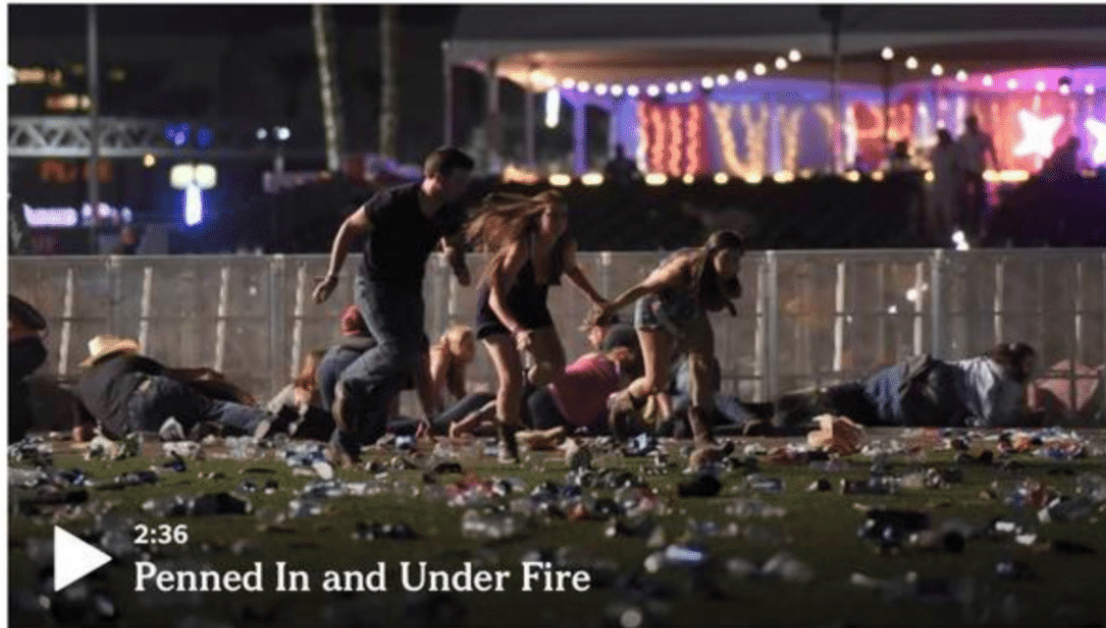
- The police identified the suspect as Stephen Paddock, 64, and said he had killed himself.
- In his hotel room, the suspect had at least 17 firearms, including a handgun, and some were rifles equipped with scopes, an official said.

4566 Comments

THE SCENE

A Burst of Gunfire, a Pause, Then Carnage That Would Not Stop

Thousands of concertgoers found themselves turned into targets, and many lay flat,



Video by CAMILLA SCHICK, DAVE HORN and CHRIS CIRILLO. Photo by David Becker/Getty Images

THE VICTIMS

Mourning the Many Lives 'Gone Too Fast'

By JULIE BOSMAN



Mandalay Bay
Resort and Casino



OPINION

OP-ED CONTRIBUTOR

Nothing Will Change After the Las Vegas Shooting

By STEVE ISRAEL 7:33 PM ET

I used to hope that tragedy would inspire my colleagues in Congress to take action about gun violence. It never does.

98 Comments

OP-ED COLUMNIST

Preventing Mass Shootings Like the Vegas Strip Attack

By NICHOLAS KRISTOF 4:47 PM ET

What we need most of all isn't mourning, but action.

2020 Comments

CONTRIBUTING OP-ED WRITER

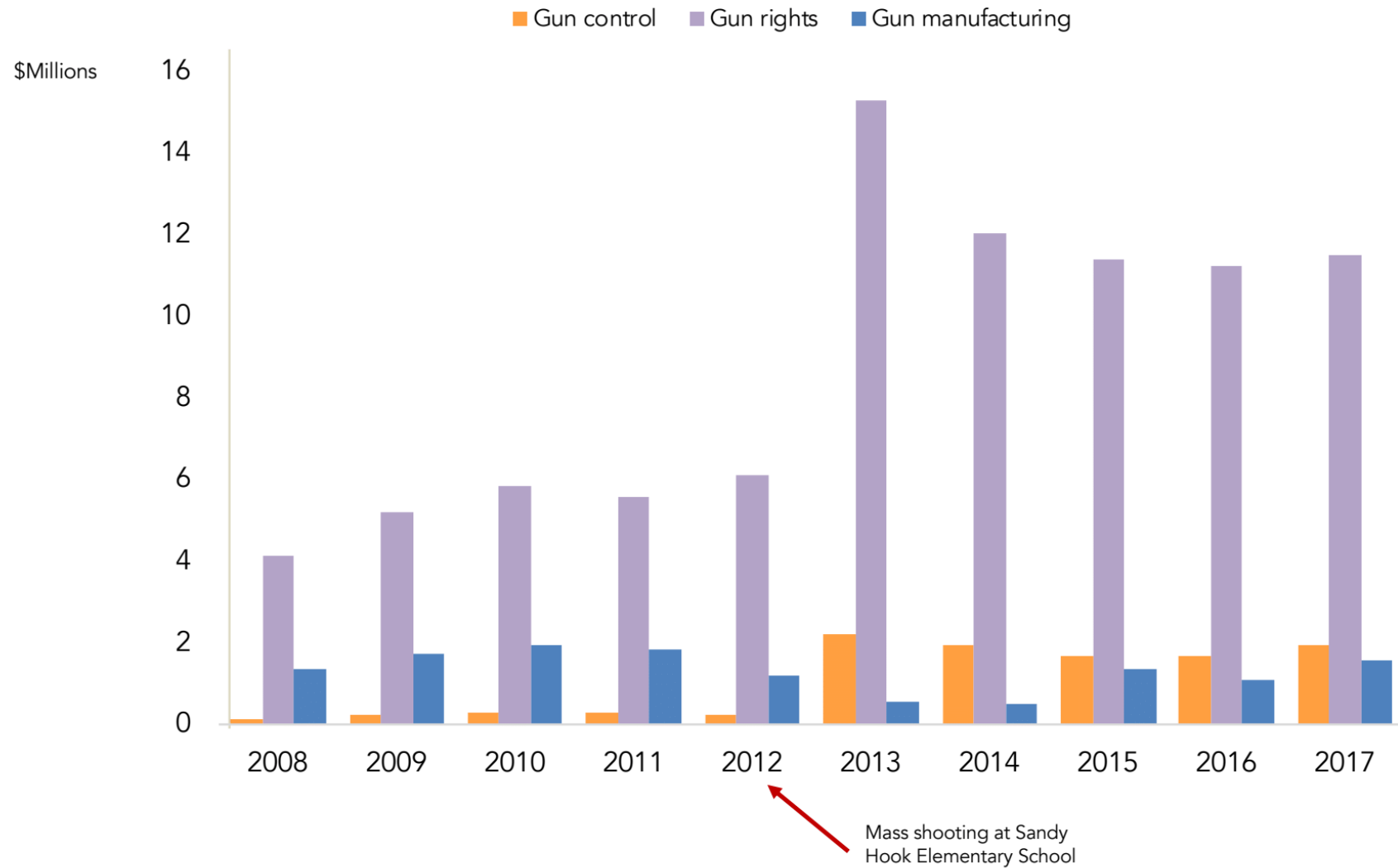
In Las Vegas, We Take Care of People

By BRITTANY BRONSON
5:30 PM ET

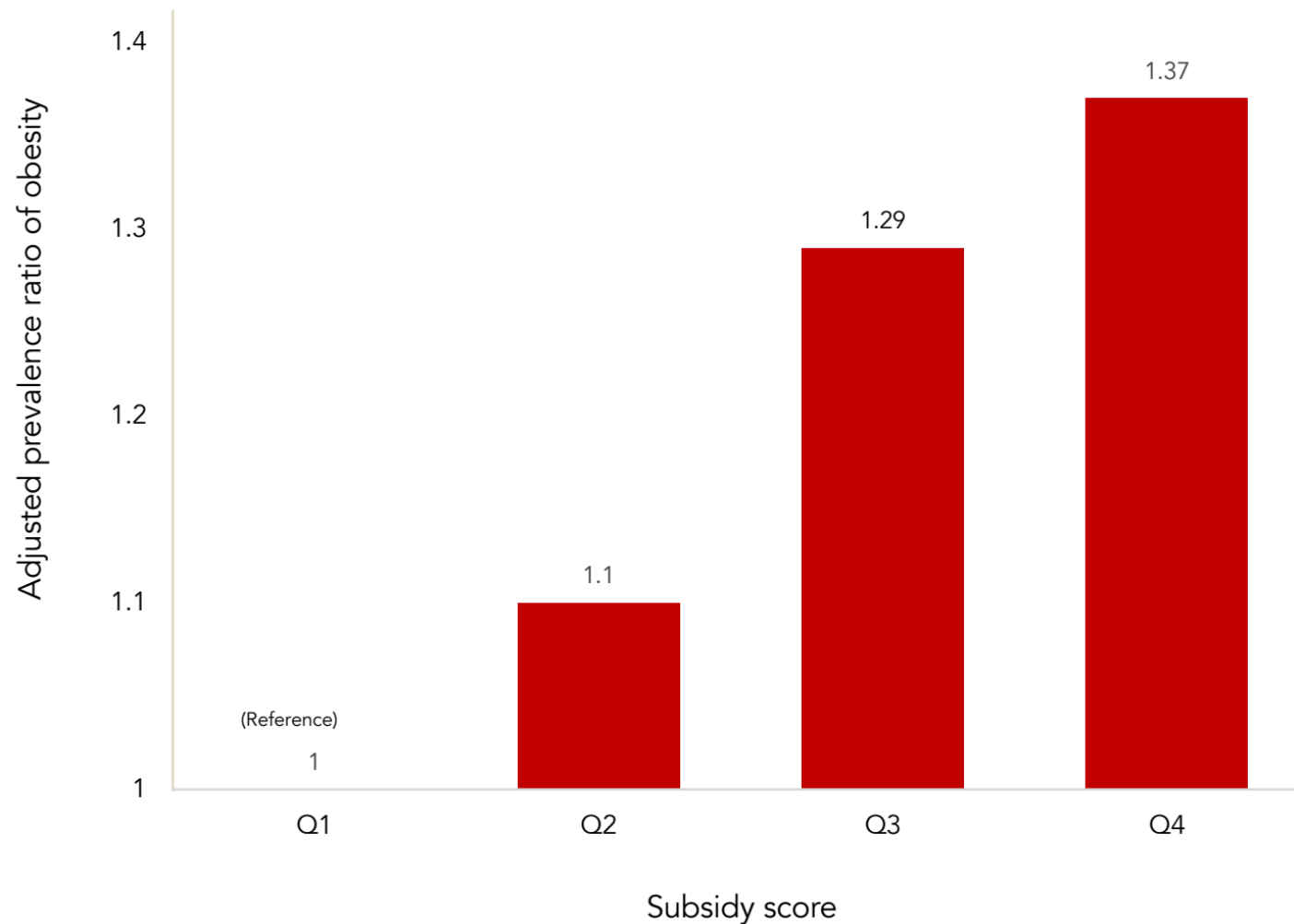
But hospitality and prayers can do only so much to prevent another shooting.

Letters: Pleas for Gun Control

Annual gun lobbying expenditures for different groups, 2008 to 2017



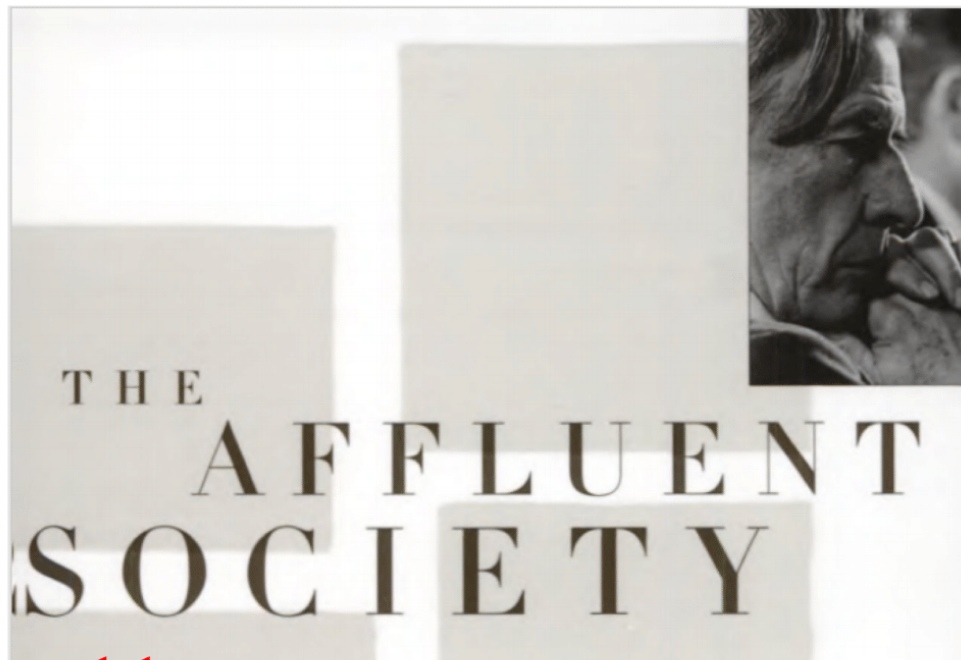
Adjusted prevalence ratio of obesity by subsidy score quartiles, National Health and Nutrition Examination Survey from 2001 to 2006





<https://www.newyorker.com/news/news-desk/medicare-made>

3. Think of health as a public good



“...things [that] do not lend themselves to [market] production, purchase, and sale. They must be provided for everyone if they are to be provided for anyone, and they must be paid for collectively or they cannot be had at all ”



AS SEEN ON 
The Pinnacle List







<https://www.atlasobscura.com/places/jeremy-benthams-auto-icon>



Big Blue's heartbreak

Star running back's career over at 23 **SEE SPORTS**




**CNN
gal
bites
EMTs**

Page Six

EBOLA!

Man tested for disease in NYC



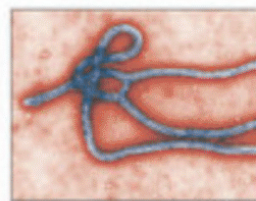
By JAMIE SCHRAM
Fears of an Ebola outbreak in New York City were heightened on Monday when a man who recently returned from West Africa was treated at a Manhattan hospital for symptoms of the deadly disease.

The unidentified patient,

complaining of high fever and gastrointestinal distress, was placed in "strict isolation" at Mount Sinai Hospital (left) while he underwent a battery of tests for the virus (right).

The hospital expects to receive the results either

See **EBOLA** Page 4





Minnesota's measles outbreak is what happens when anti-vaxxers target immigrants

A new study found Minnesota children with foreign-born parent were 25 percent less likely to have their vaccines.

By Julia Belluz | @juliaoftoronto | julia.belluz@voxmedia.com | Oct 26, 2017, 12:59pm EDT

f 🐦  SHARE




Vaccination rates plummeted in Minnesota after anti-vaccine advocates targeted an immigrant group, making its members more susceptible to preventable diseases — such as measles and mumps. | BSIP / Contributor/ Getty

MOST READ



Trump's ties to the Russian mafia go back 3 decades





**10% of children killed by motor vehicles were
pedestrians killed by an alcohol-impaired driver**

https://www.cdc.gov/motorvehiclesafety/impaired_driving/impaired-driv_factsheet.html
<https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812231>

True compassion is more than
flinging a coin to a beggar; it
comes to see that an edifice
which produces beggars needs
restructuring





Marco Rubio ✓

@marcorubio

Follow

Saddened by the deadly shooting in Virginia this morning. My thoughts and prayers are with the family and friends of the victims.

11:29 AM - 26 Aug 2015

228 414



John Faso ✓

@RepJohnFaso

Follow

This senseless shooting in Las Vegas is absolutely heart breaking. My thoughts and prayers go out to all of the victims and their families.

6:06 AM - Oct 2, 2017

376 7 30



Marco Rubio ✓

@marcorubio

Follow

Our prayers are with those injured and killed early this morning in horrifying act of terror in Orlando.

8:15 AM - 12 Jun 2016

2,849 5,959



Speaker John Boehner ✓

@SpeakerBoehner

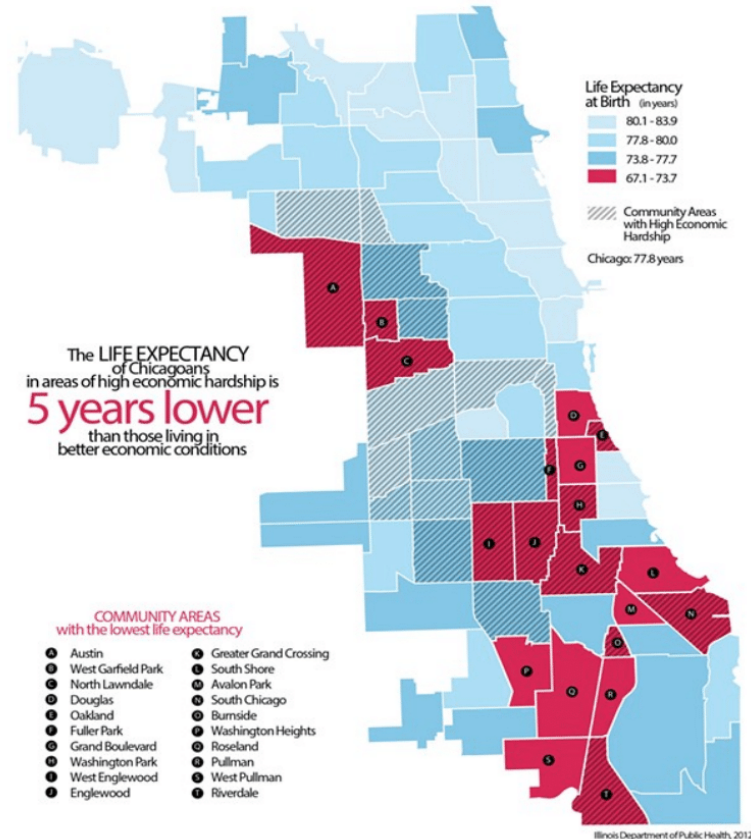
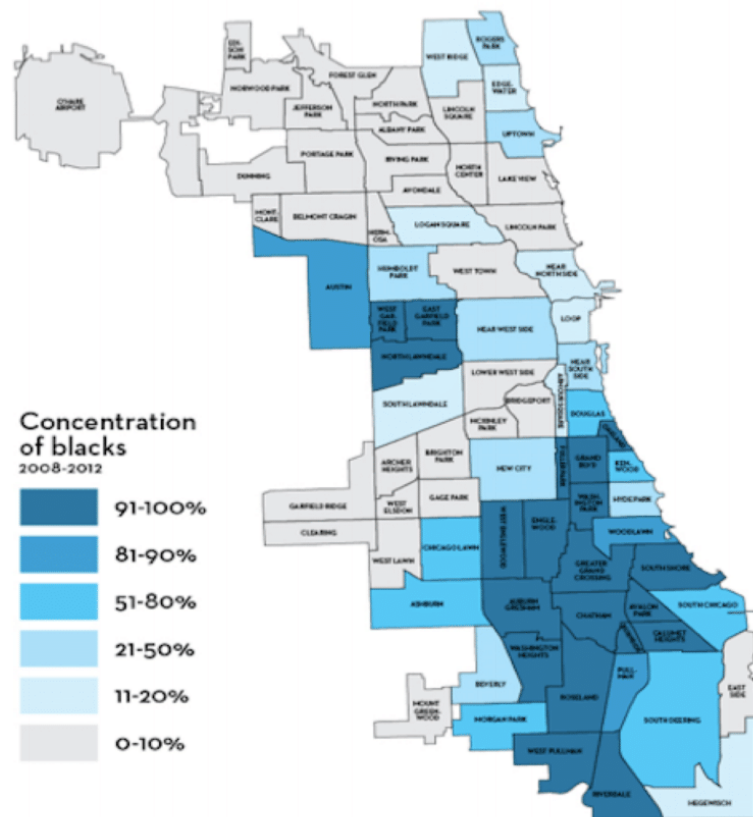
Follow

Prayers for the victims, families, students, & faculty at Umpqua Community College, & the community of Roseburg, Oregon.

11:47 AM - 1 Oct 2015

125 141

Racial segregation is associated with lower life expectancy



4. Recognize health as a means, not an end

“ Health is a state of complete physical, mental, and social well being, and not merely the absence of disease or infirmity. ”

FEBRUARY 23 / MARCH 2, 2015

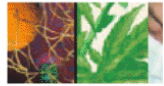
SPECIAL
HEALTH
DOUBLE
ISSUE

TIME

THIS
BABY
COULD
LIVE
TO BE
142
YEARS
OLD

Dispatches From the
Frontiers of Longevity

time.com



The NE



Personalized medicine: inevitable

Perspective
JULY 22, 2010

The Path to Personalized Medicine

Margaret A. Hamburg, M.D., and Francis S. Collins, M.D., Ph.D.

Major investments in basic science have created the NIH and the FDA will invest in advancing translational and

clinic
hund

Journal of Diabetes Science and Technology

Volume 3, Issue 4, July 2009

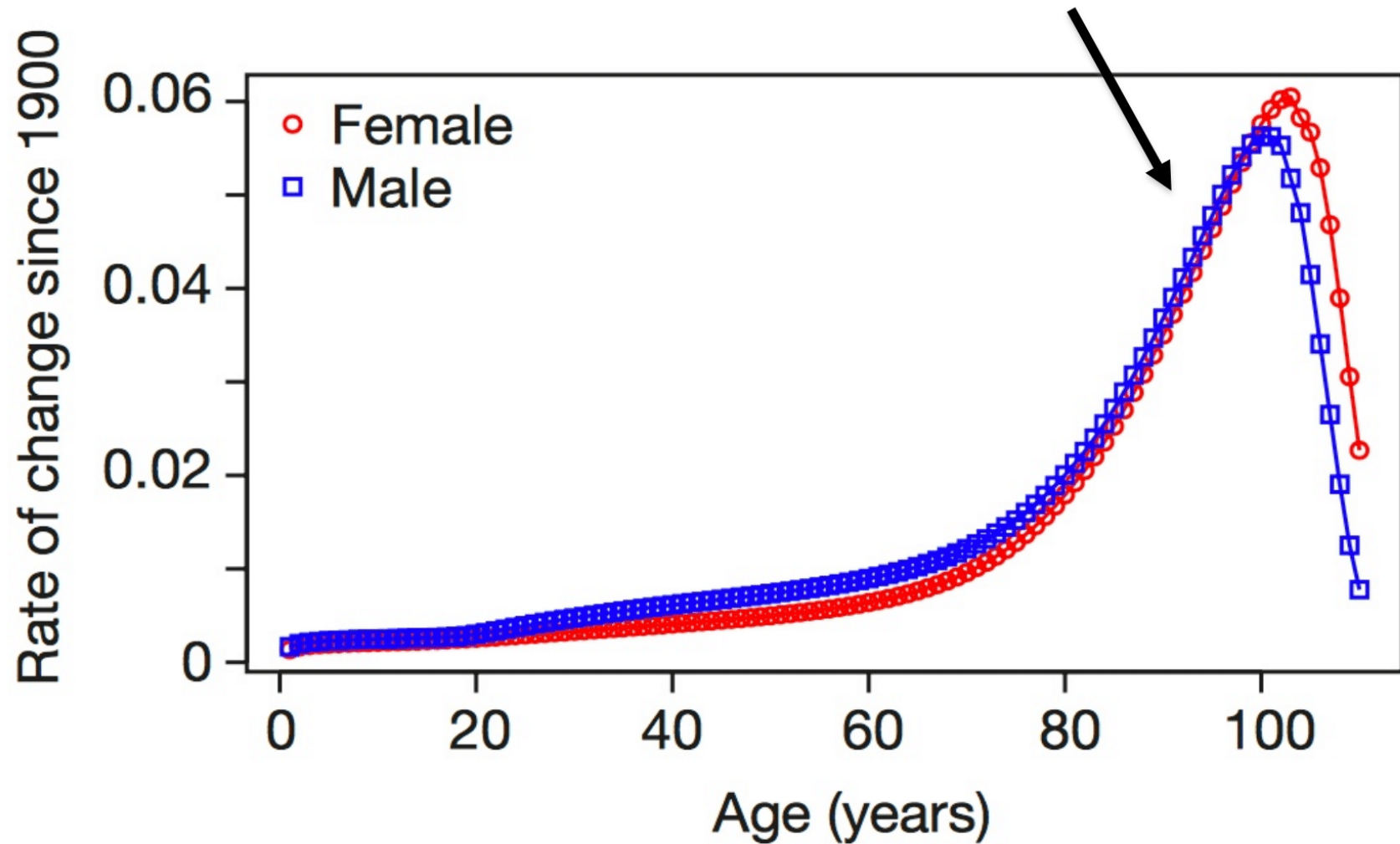
© Diabetes Technology Society

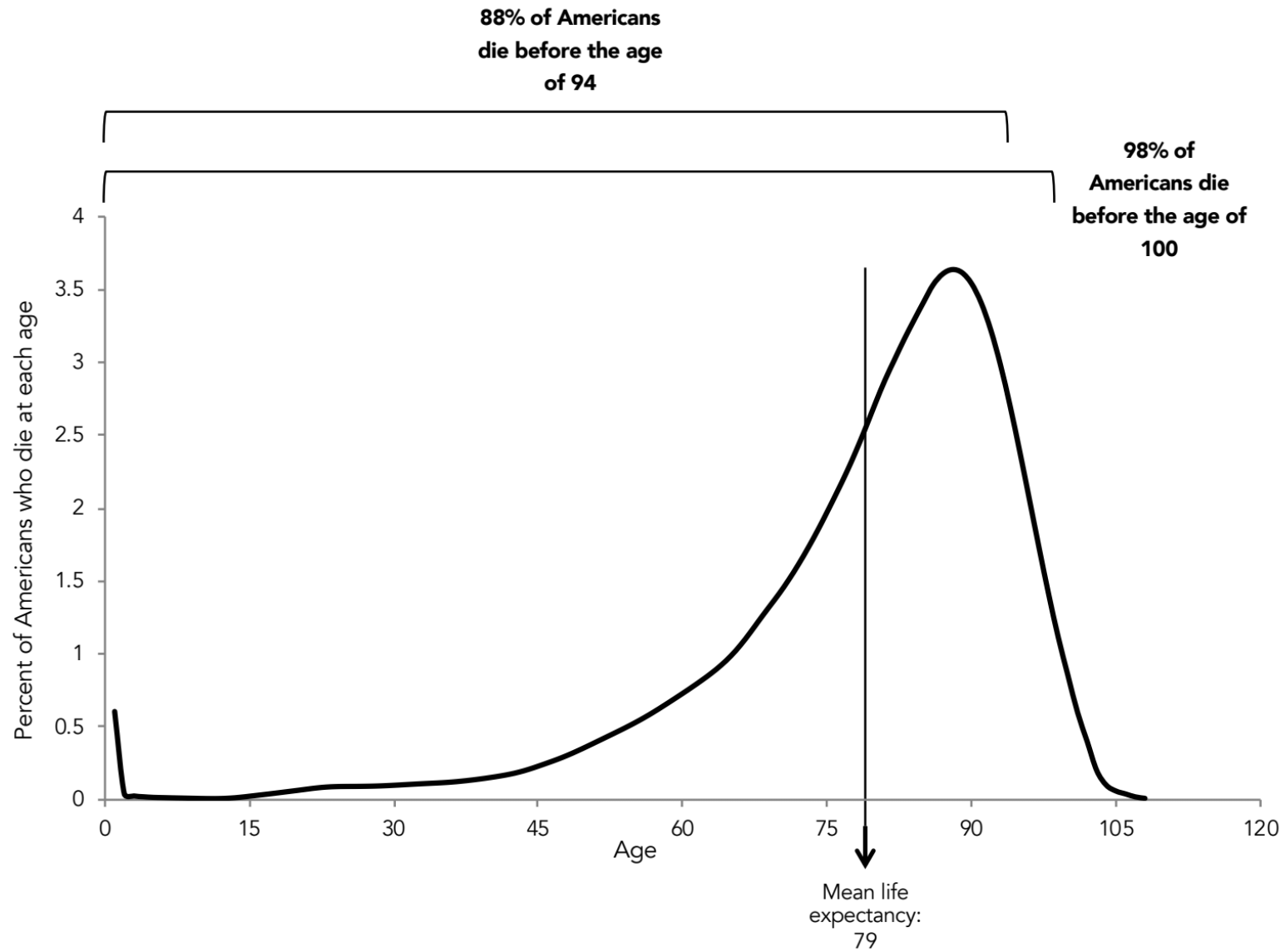
SYMPOSIUM

The Case for Personalized Medicine

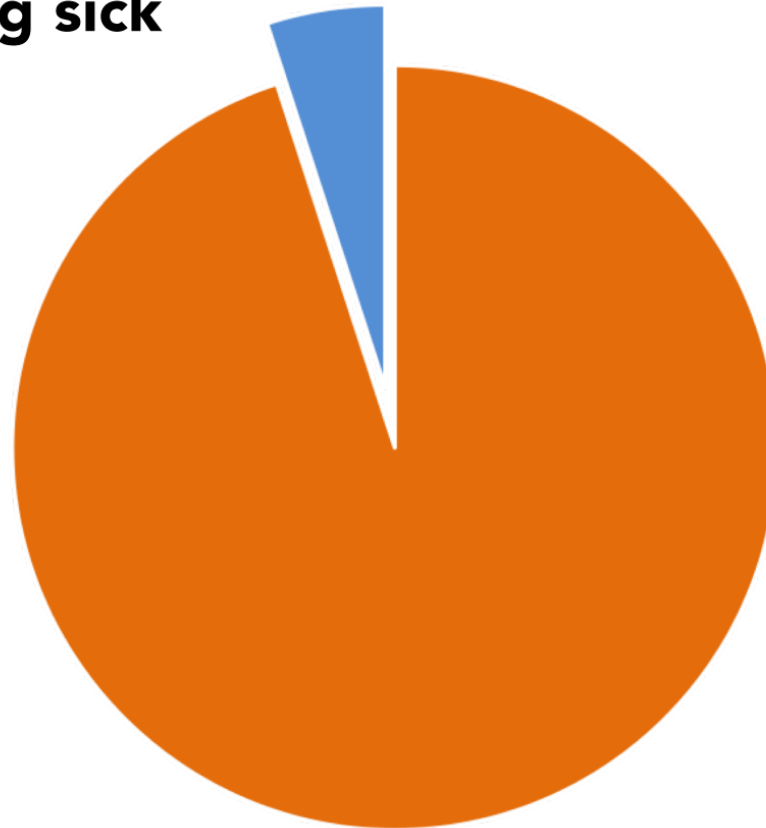
Edward Abrahams, Ph.D.,¹ and Mike Silver, Ph.D.²

Potential gain in survival peaks at ~100; then rapid decline till ~115





**Prevention,
keeping us from
getting sick**



**Treatment,
curing us
once we get
sick**

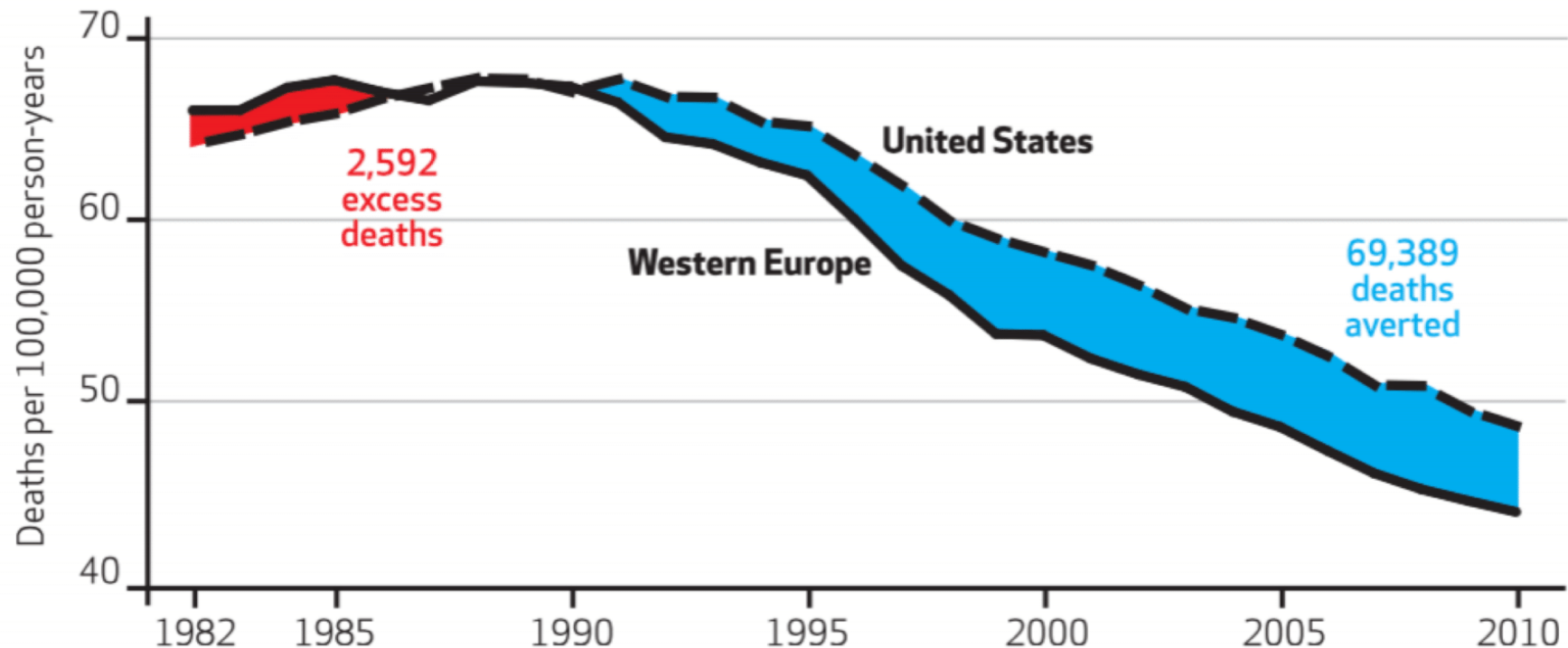
"Healthy People/Healthy Economy: An Initiative to Make Massachusetts the National Leader in Health and Wellness." 2015. Data from NEHI 2013.

<<http://www.tbf.org/tbf/56/hphe/Health-Crisis>>

Tarlov A. Social determinants of health: the sociobiological translation. In: Blane D, Brunner E, Wilkinson R, editors. Health and social organization: towards a health policy for the 21st century. London: Routledge; 1996 pp. 71-93.

EXHIBIT 1

Excess And Averted Breast Cancer Deaths In The United States, Compared To Western Europe, 1982-2010



SOURCE Authors' analysis of data from the World Health Organization Cancer Mortality Database and the Human Mortality Database (see Note 13 in text).

5. Choose the freedom to be healthy

In CONGRESS, July 4, 1776.

DECLARATION,

By the REPRESENTATIVES of the
UNITED STATES OF AMERICA,
In GENERAL CONGRESS Assembled.

WHEN in the course of human events, it becomes necessary for one people to dissolve the Political Bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are Life, Liberty, and the Pursuit of Happiness.—That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed, that whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it, and to institute new government, laying its foundation on such principles, and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes, and accordingly all experience hath shewn, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government, and to provide new guards for their future security. Such has been the patient sufferance of these Colonies, and such is now the necessity which constrains them to alter their former system of government. The history of the present King of Great-Britain is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute Tyranny over these States. To prove this, let facts be submitted to a candid

For protecting them by a mock Trial, from punishment for any Murders which they should commit on the Inhabitants of these States :

For cutting off our Trade with all parts of the World :

For imposing Taxes on us without our consent :

For depriving us, in many Cases of the benefits of Trial by Jury :

For transporting us beyond Seas to be tried for pretended Offences :

For abolishing the free System of English Laws, in a neighbouring Province, establishing therein an arbitrary Government, and enlarging its Boundaries, so as to render it at once an example and fit instrument for introducing the same absolute rule into these Colonies :

For taking away our Charters, abolishing our most valuable Laws, and altering fundamentally the Forms of our Governments :

For suspending our own Legislatures, and declaring themselves invested with power to legislate for us in all Cases whatsoever.

He has abdicated Government here, by declaring us out of his protection, and waging War against us.

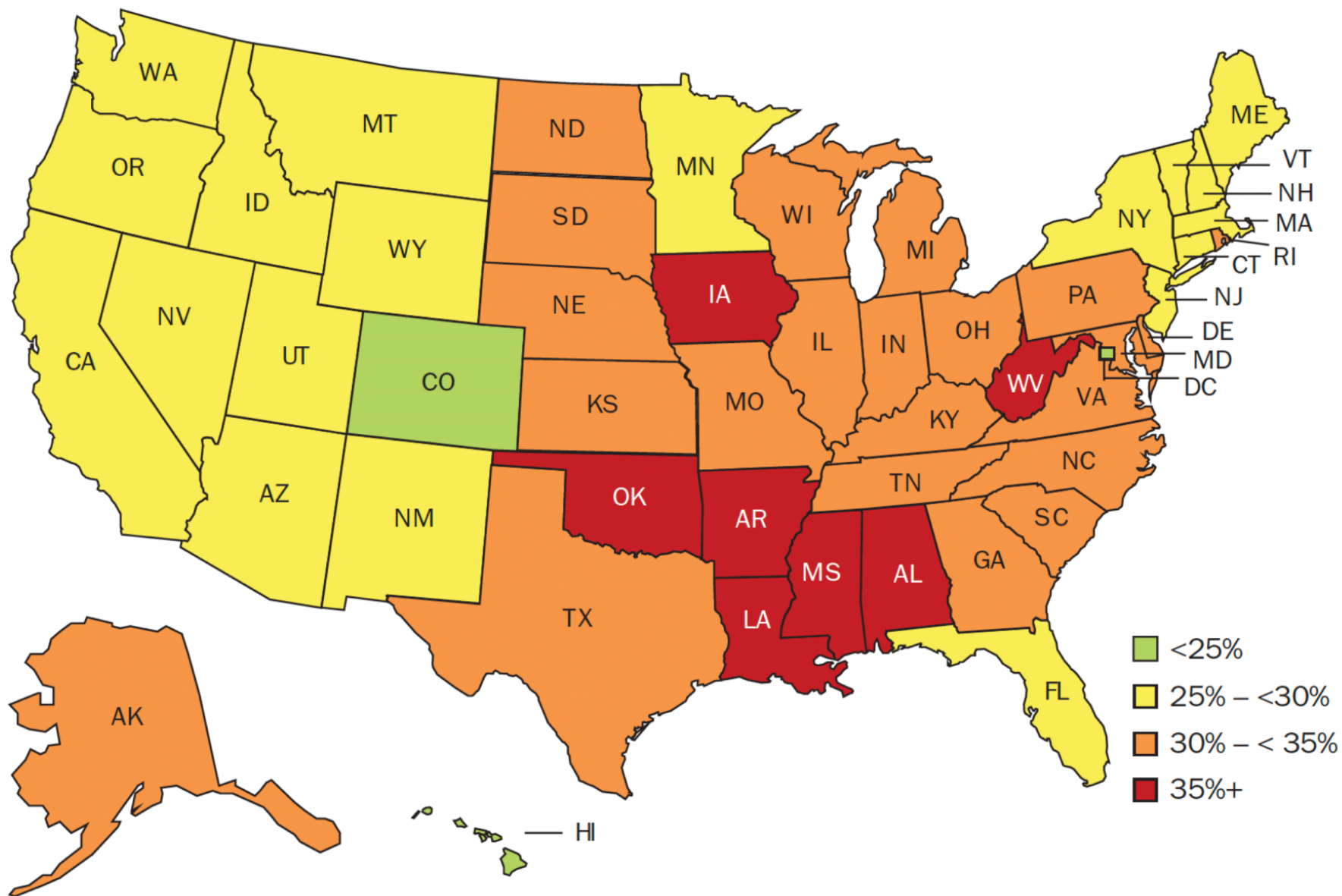
He has plundered our Seas, ravaged our Coasts, burnt our Towns, and destroyed the lives of our people.

He is at this time, transporting large Armies of foreign Mercenaries to complete the works of Death, Desolation and Tyranny, already begun with circumstances of Cruelty and Perfidy scarcely paralleled in the most barbarous Ages, and totally unworthy the Head of a civilized Nation.

He has constrained our fellow Citizens taken Captive on the high Seas to bear Arms against their Country, to become the Executioners of their Friends and Brethren, or to fall themselves by their hands.

He has excited Domestic Insurrections among us, and has endeavored to bring on

Adult Obesity Rates by State, 2017



SOURCE: BRFSS

New soda wars: infringement on freedoms?

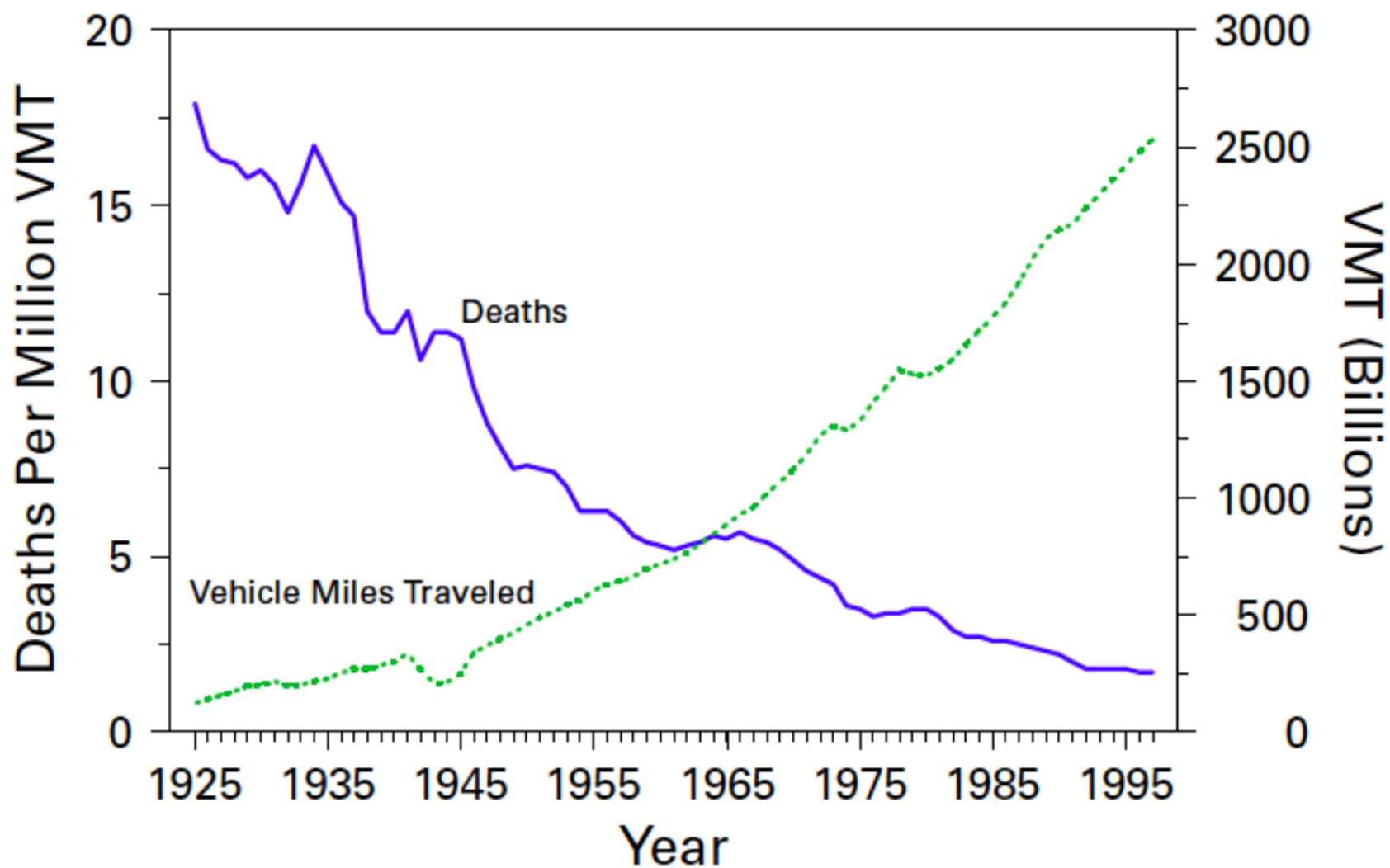
June 06, 2012 | Daily News Editorial

SHENEMAN THRU MEDIA SERVICES



Food		20 Years Ago	Today
Bagel		140 calories (3" diameter)	350 calories (6" diameter)
Muffin		210 calories (1.5 oz)	500 calories (4 oz)
Cheeseburger		333 calories	590 calories
Pasta (Spaghetti & Meatballs)		500 calories	1025 calories
French Fries		210 calories (2.4 oz)	610 calories (6.9 oz)
Soda		85 calories (6.5 oz)	250 calories (20 oz)
Theater Popcorn		270 calories (5 cups)	630 calories (1 tub)
Turkey Sandwich		320 calories	820 calories
Pizza		500 calories (2 slices)	850 calories (2 calories)

FIGURE 1. Motor-vehicle-related deaths per million vehicle miles traveled (VMT) and annual VMT, by year — United States, 1925–1997



A concluding metaphor



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