



Public Health Metamorphosis: *on the road to butterfly*

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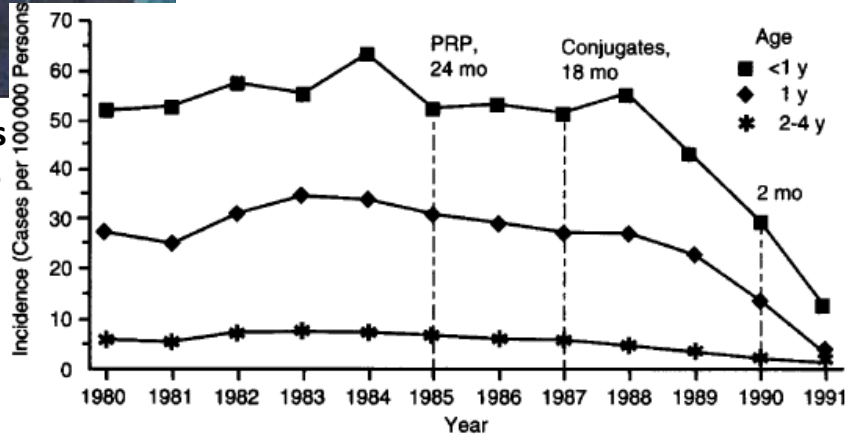
Rochester, NY, October 14, 2016



1996 Lasker Laureates
Hib conjugate vaccine

1996 Albert Lasker Clinical Medical Research Award

Vaccine for preventing meningitis in children



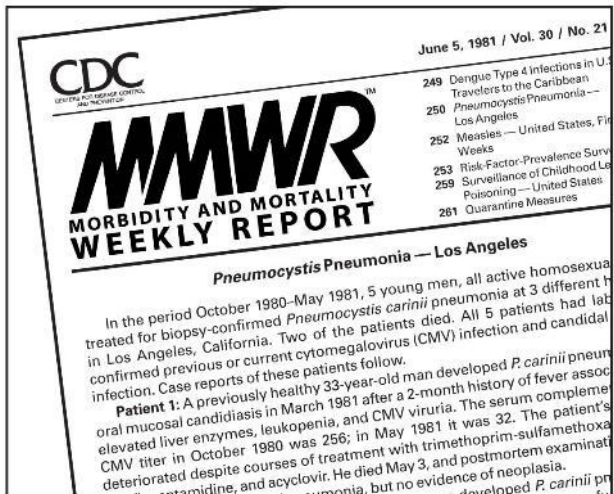
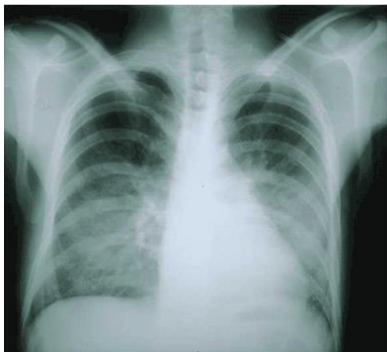
**CHILDHOOD VACCINE WITH ROCHESTER ROOTS
RECOGNIZED**



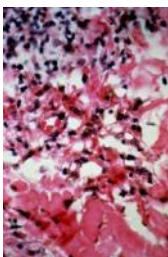
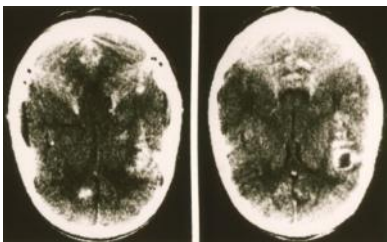
2007 National Medal of Technology
Pneumococcal conj. vaccine



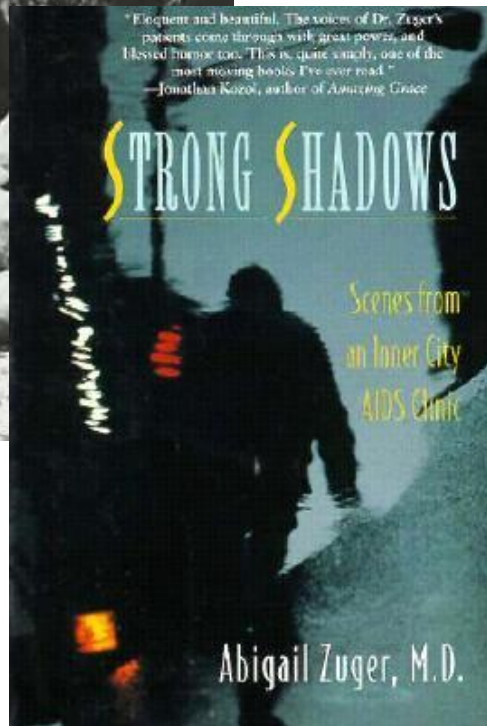
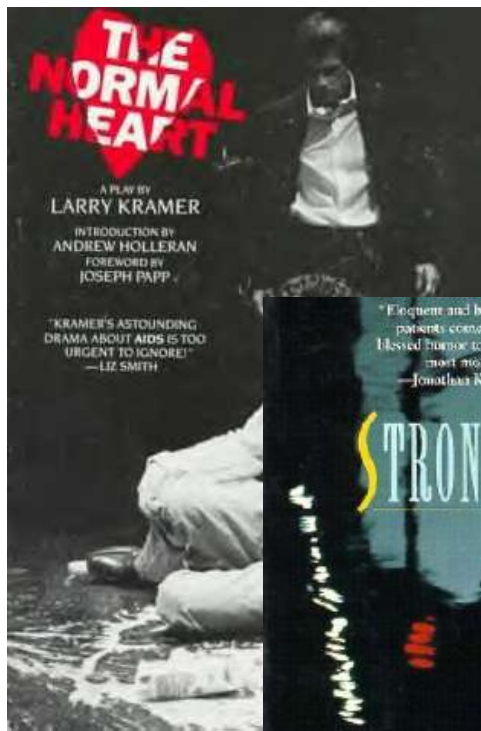
PCP pneumonia



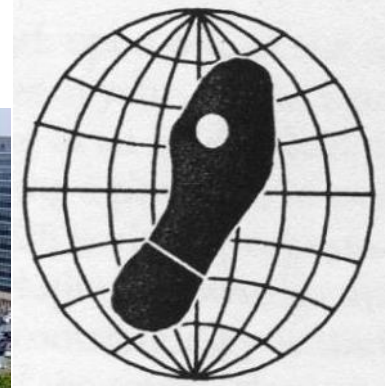
Cerebral toxoplasmosis



Kaposi's Sarcoma



Epidemic Intelligence Service



- 2-year applied epi training
- Post-grad (e.g., MD, PhD, DVM, RN)
- Atlanta HQ or Field positions
- Outbreaks, analytic work, community and global opportunities



AJPH PERSPECTIVES

Public Health 3.0: Time for an Upgrade

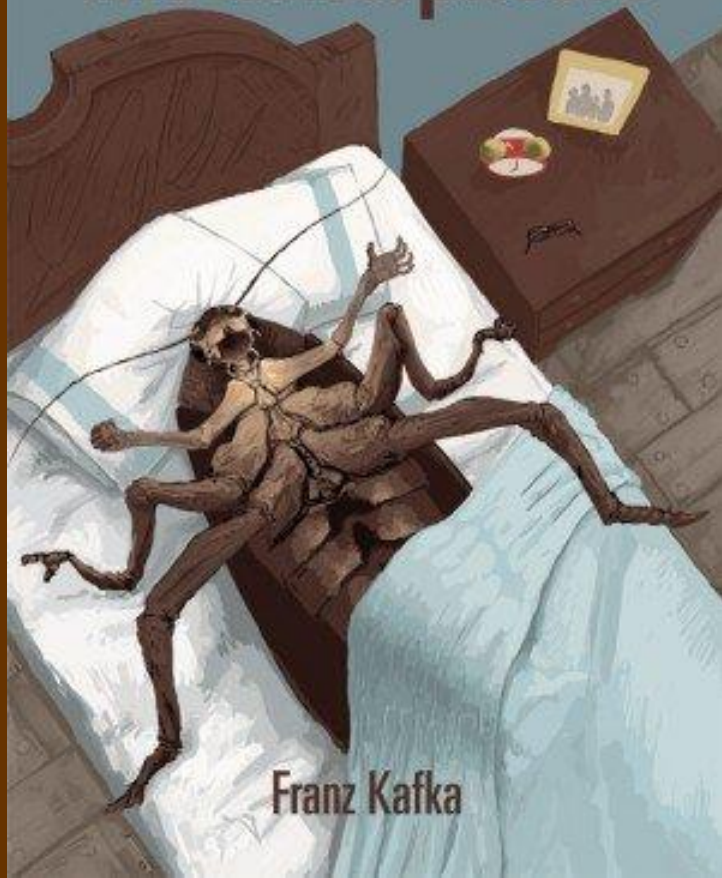
value-based payments, potentiating innovative prevention and health-promoting care models.⁶

American Journal of Public Health: April 2016, Vol. 106, No. 4, pp. 621–622.



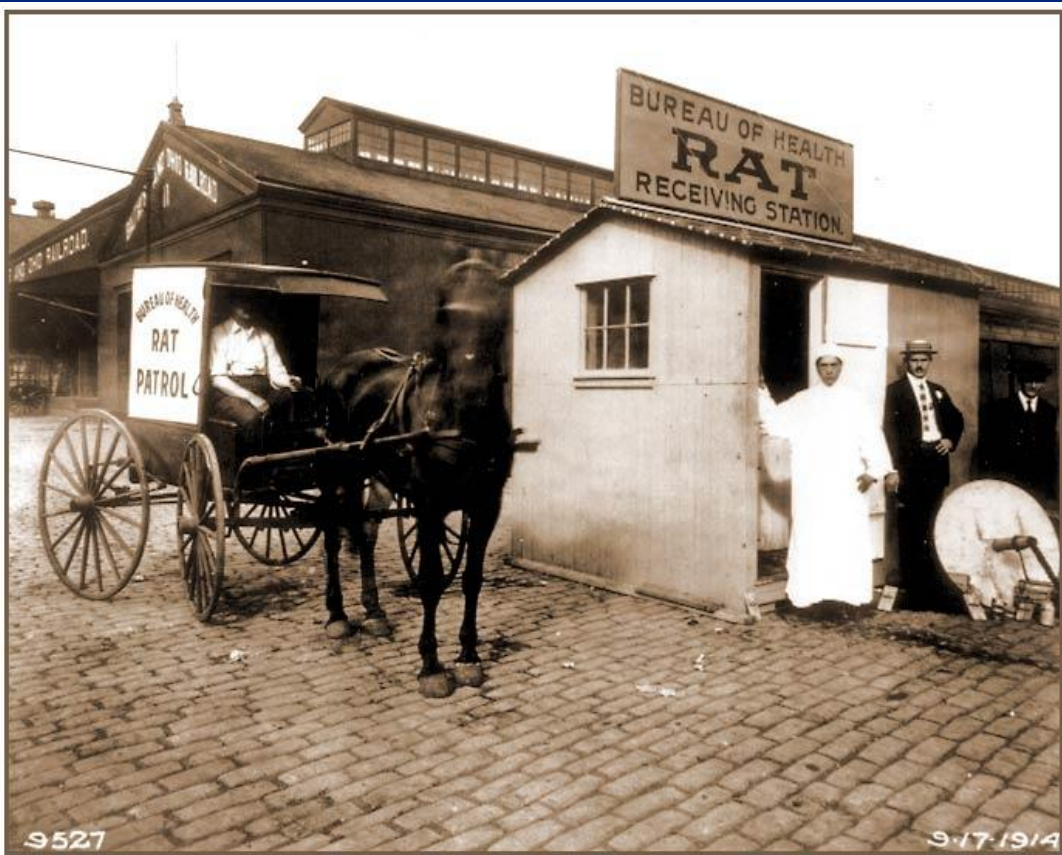


The Metamorphosis



Franz Kafka



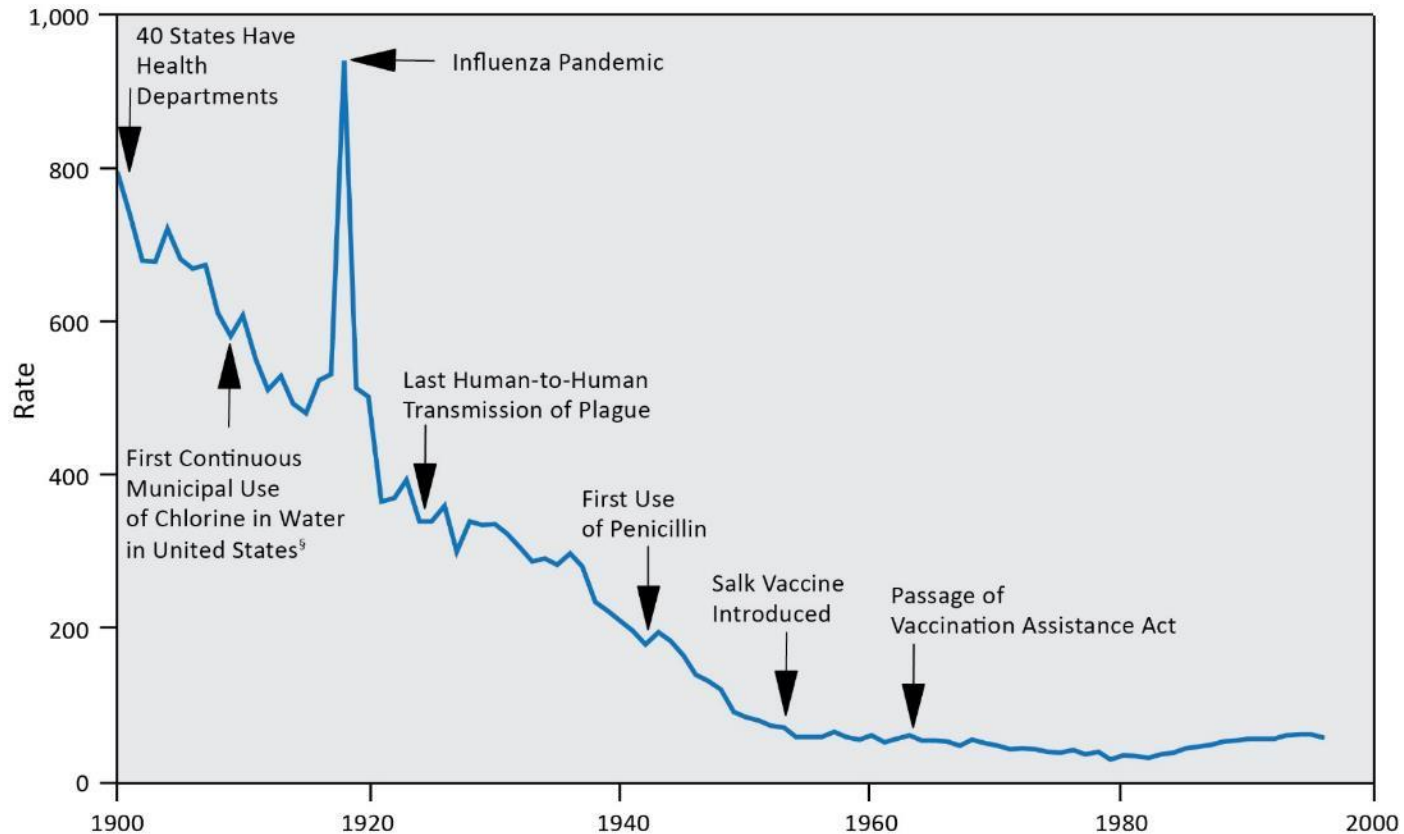


Causes of Death, 1900

1. **Pneumonia and influenza**
2. **Tuberculosis**
3. **Diarrhea, enteritis**
4. Diseases of the heart
5. Intracranial lesions of vascular origin
6. Nephritis/kidney disease
7. All accidents
8. Cancer and other malignant tumors
9. Senility
10. **Diphtheria**



Crude death rate for infectious disease — United States, 1900–1996†

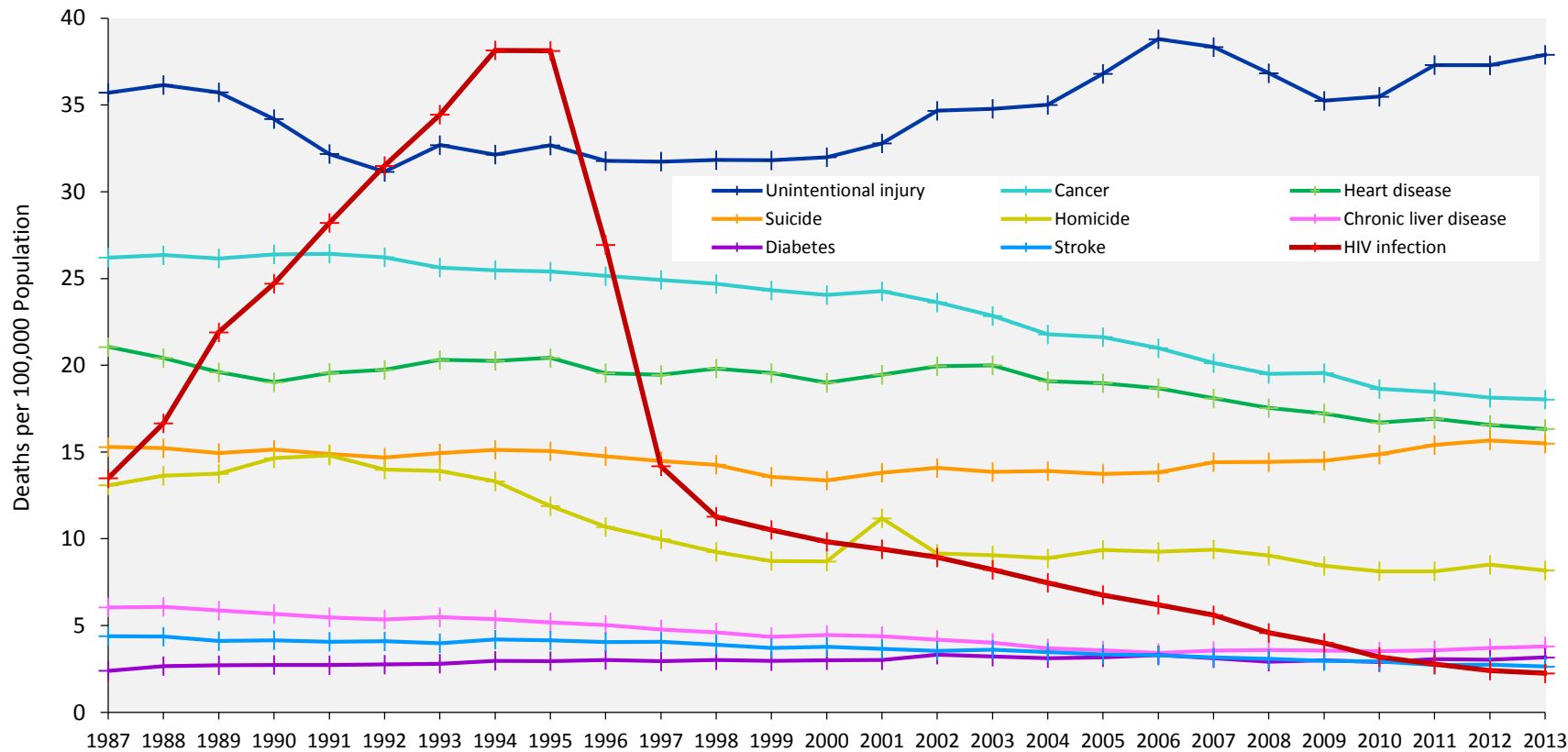


* Per 100,000 population per year

† Adapted from Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. *JAMA* 1999;281:61–6.

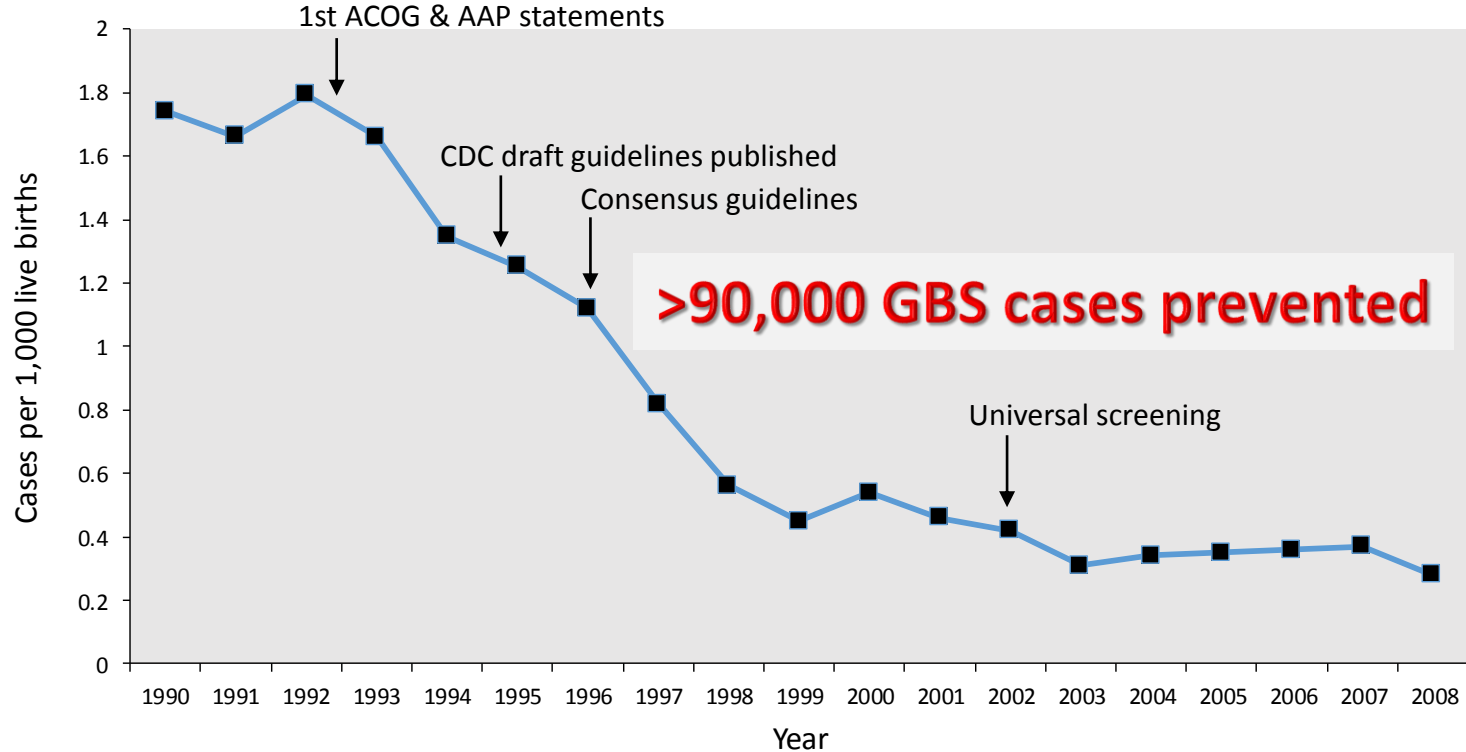
§ American Water Works Association. Water chlorination principles and practices: AWWA manual M20. Denver, Colorado: American Water Works Association, 1973.

Trends in Annual Rates of Death due to the 9 Leading Causes among Persons 25–44 Years Old, United States, 1987–2013



Note: For comparison with data for 1999 and later years, data for 1987–1998 were modified to account for ICD-10 rules instead of ICD-9 rules.

Early-onset Group B Streptococcal disease, US



Source: ABCs/Emerging Infections Program Network, CDC
www.cdc.gov/abcs

Vaccines for Children

20 years of protecting America's children

The Vaccines for Children program was established in 1994 to make vaccines available to uninsured children. VFC has helped prevent disease and save lives...big time!



CDC estimates that vaccination of children born between 1994 and 2013 will:

prevent **322 million** illnesses



help avoid **732,000** deaths



save nearly **\$1.4 trillion** in total societal costs
(that includes \$295 billion in direct costs)



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

MMWR: Benefits from Immunization During the Vaccines for Children Program Era — United States, 1994–2013 NCIRD-404 | 04.23.2014

www.cdc.gov/features/vfcprogram

Ten Great Achievements in Public Health, 1900–1999



- Vaccination



- Motor-vehicle safety



- Safer workplaces



- Control of infectious diseases



- Decline in deaths from heart disease and stroke



- Safer and healthier foods



- Healthier mothers and babies



- Family planning



- Fluoridation of drinking water



- Recognition of tobacco as a health hazard

Ten Great Achievements in Public Health, continuing...



- Vaccination



- Motor-vehicle safety



- Safer workplaces



- Control of infectious diseases



- Decline in deaths from heart disease and stroke



- Safer and healthier foods



- Healthier mothers and babies



- Family planning



- Fluoridation of drinking water



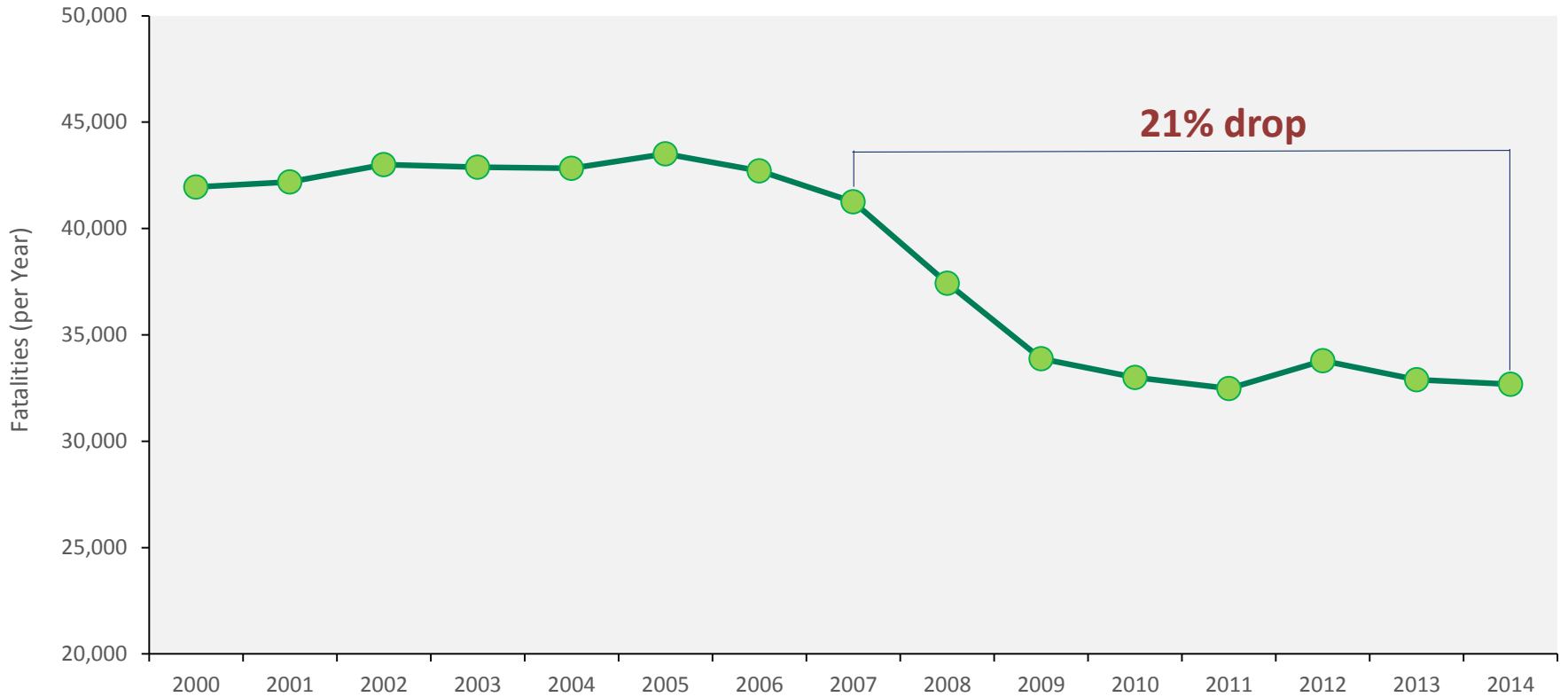
- Recognition of tobacco as a health hazard

MMWR™

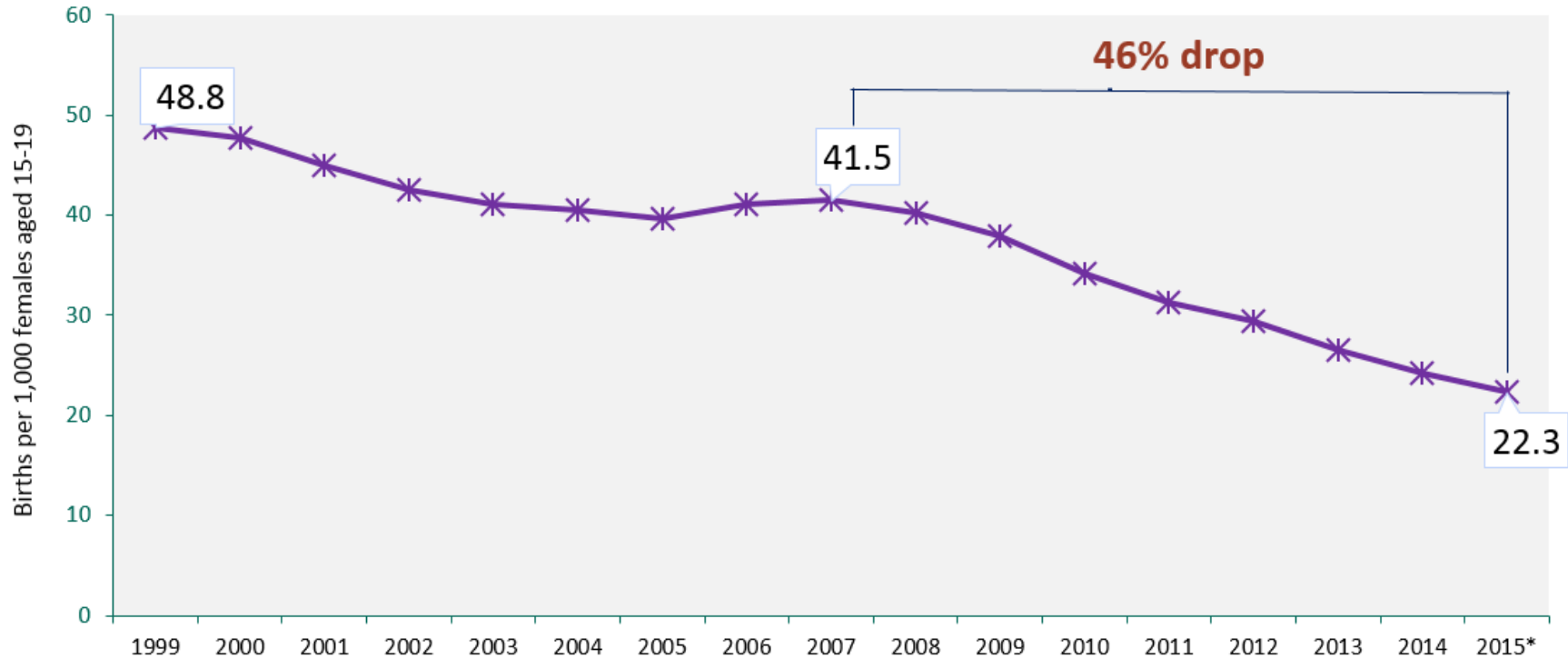
Weekly

December 24, 1999 / 48(50);1141

Motor vehicle-related deaths decreased between 2007–2014



Major decrease in teen births between 2007–2015

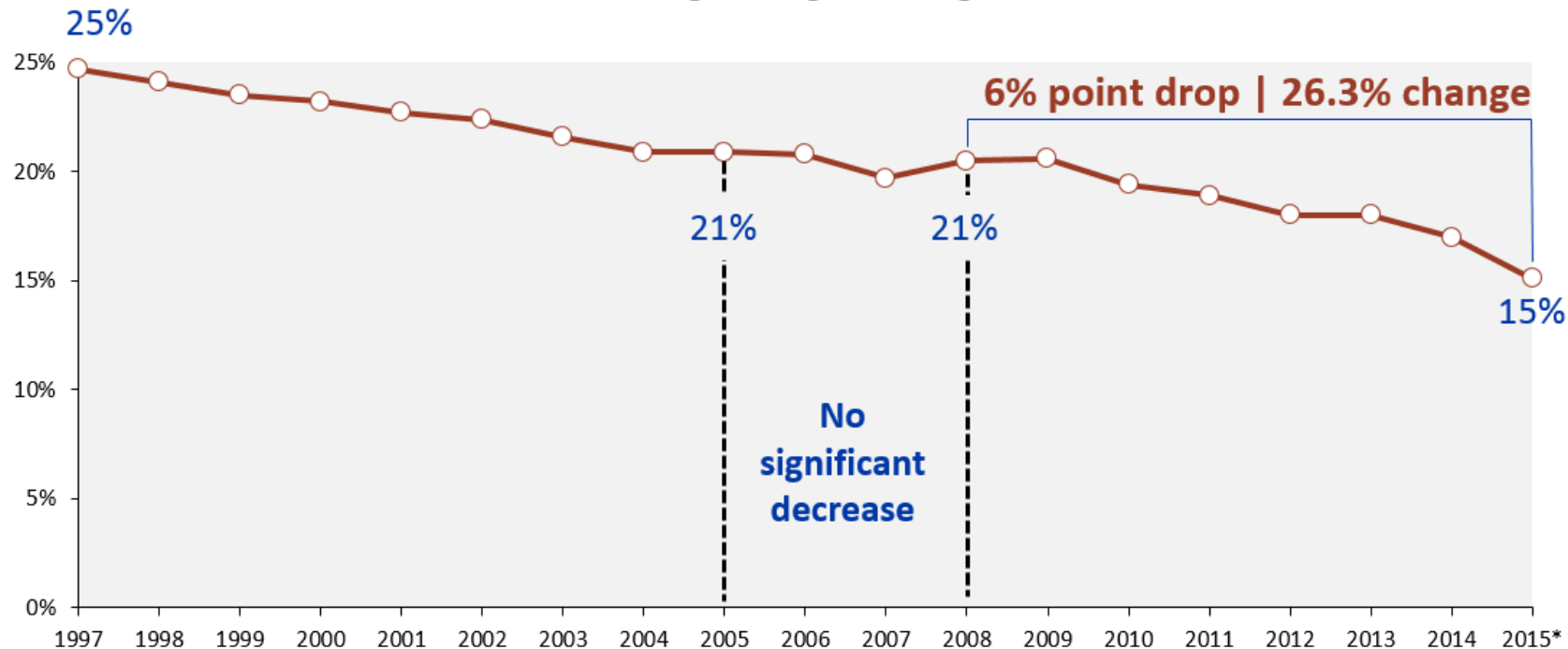


CDC/NCHS, National Vital Statistics System (NVSS)* 2015 data are preliminary

QuickStats: Birth Rates Among Teens Aged 15–19 Years, by Race/Hispanic Ethnicity — NVSS, United States, 2007 and 2015. *MMWR*. Rep 2016;65:832.

Adult cigarette smoking rates have fallen in recent years

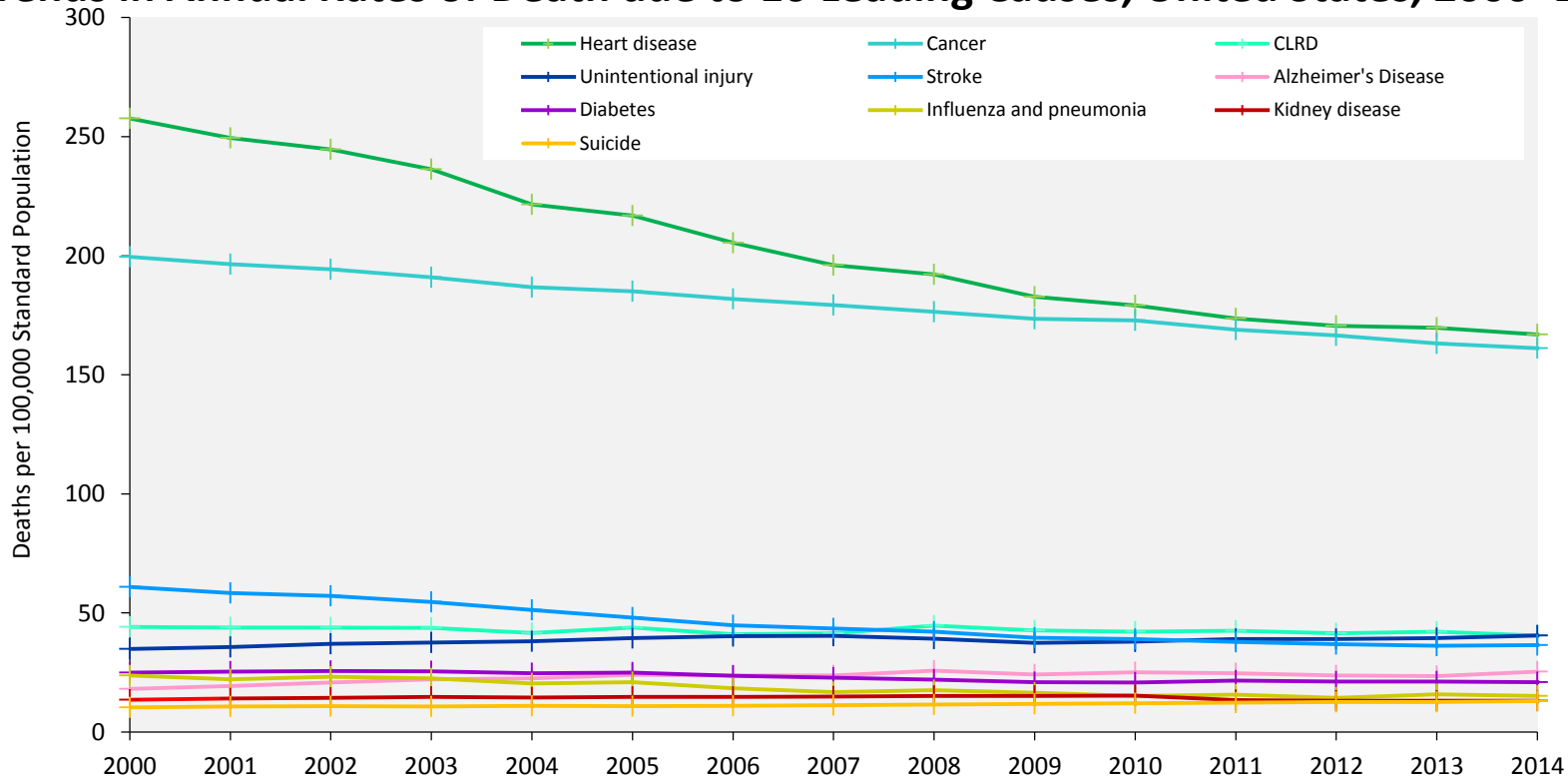
Prevalence of current smoking among adults age ≥18, U.S., 1997–2015



CDC/NCHS, National Health Interview Survey, 1997–2015, Sample Adult Core component; *2015 data are preliminary; http://www.cdc.gov/nchs/data/nhis/earlyrelease/earlyrelease201605_08.pdf

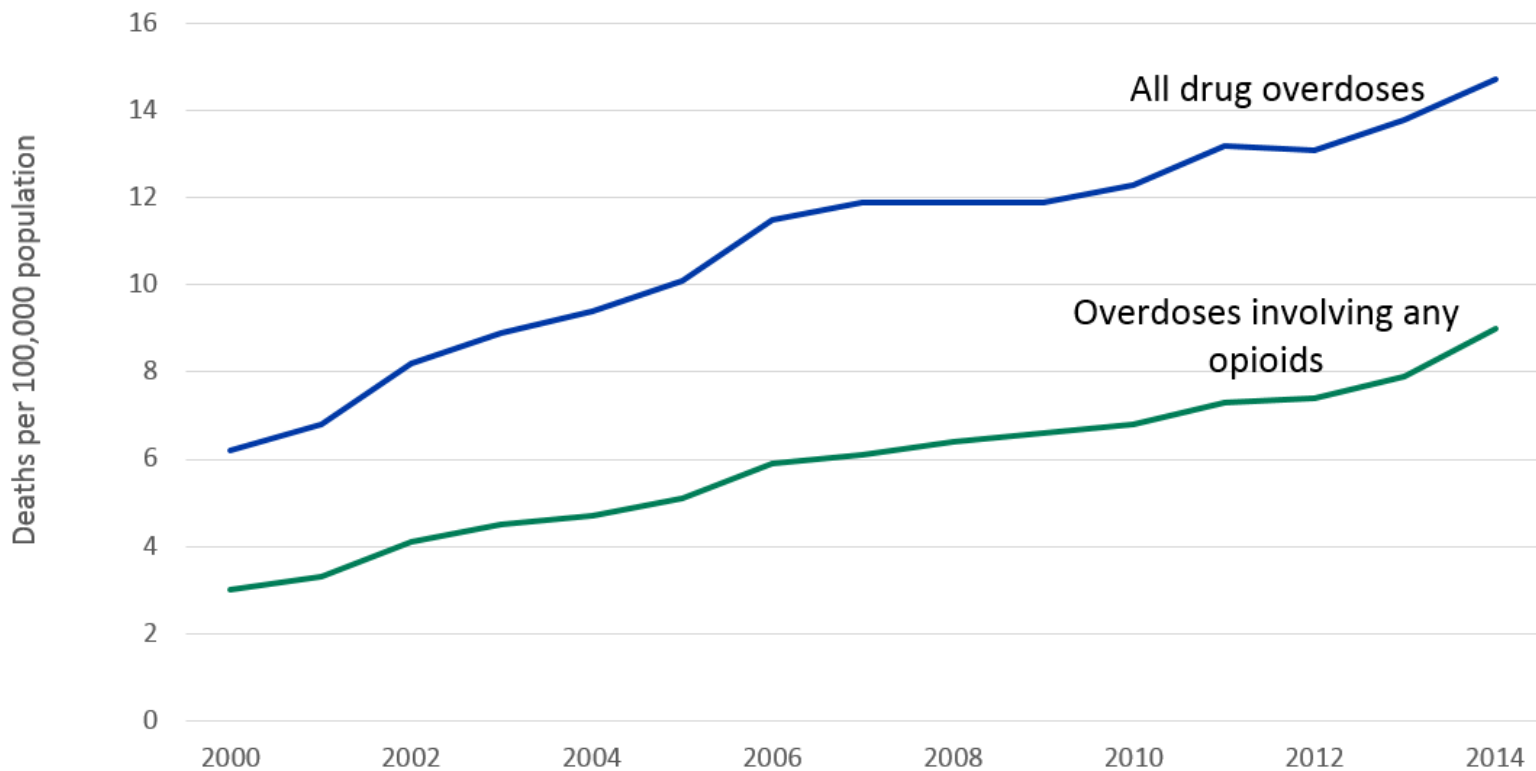
*By 2000, infectious disease accounted for only one of top ten causes
Continued progress in heart disease, cancer and stroke*

Trends in Annual Rates of Death due to 10 Leading Causes, United States, 2000–2014



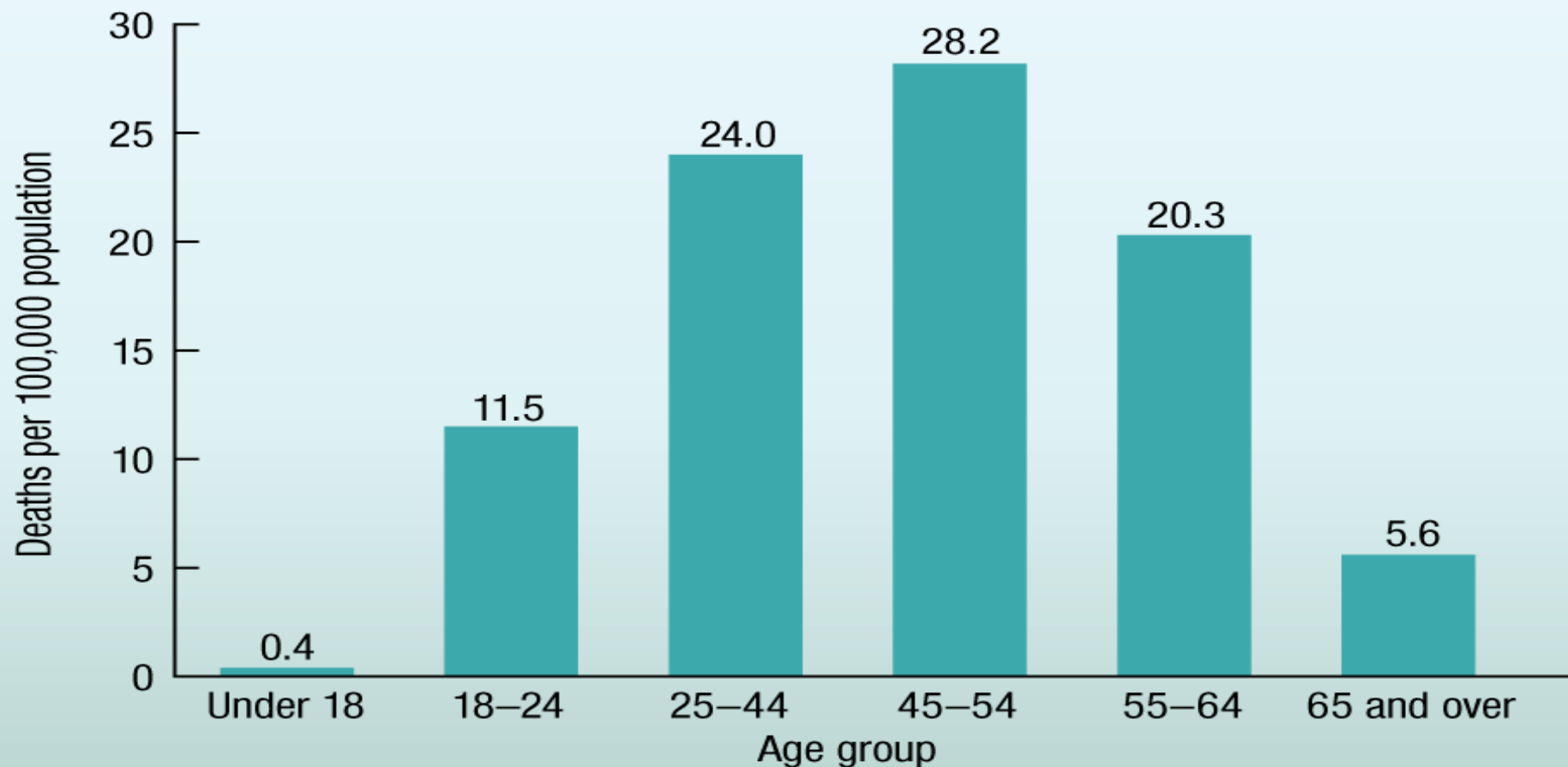
SOURCE: National Vital Statistics System Mortality File.

Age-adjusted rate of drug overdose deaths and drug overdose deaths involving opioids, United States, 2000-2014



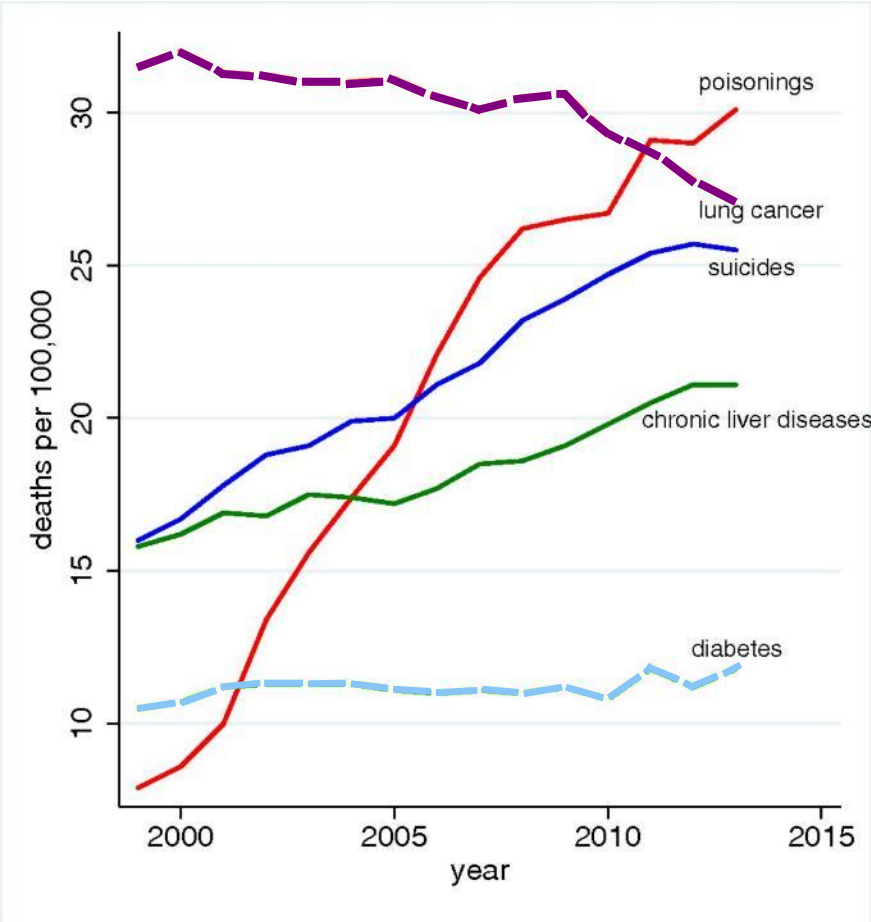
SOURCE: National Vital Statistics System Mortality File.

Drug-poisoning death rates, by age: United States, 2014



SOURCE: CDC/NCHS, National Vital Statistics System, 2014.

Mortality by cause, white non-Hispanic ages 45-54

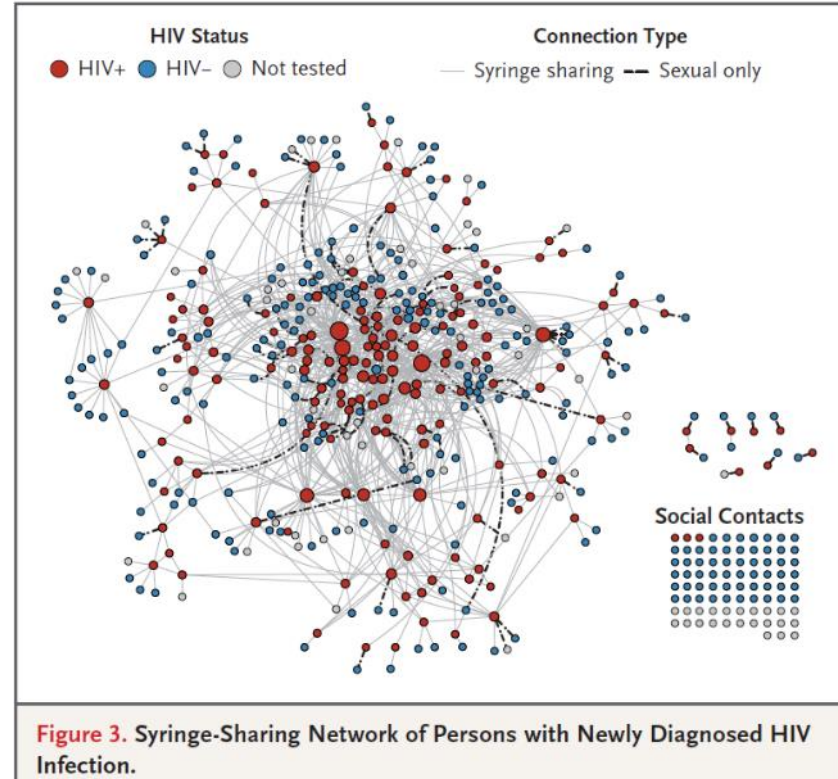


Anne Case, and Angus Deaton PNAS 2015;112:15078-15083

Rapid spread of HIV associated with injecting prescription opioids - Indiana – 2014-15

- 205 new HIV infections in Scott County
 - 4% vs. 0.6% nat'l prevalence
- ~ 500 adults (1/5 local pop.) actively injecting prescription opioids
- Multicomponent response including:
 - Testing for HIV, HCV
 - Treatment for HIV
 - Services for substance-use
 - State's 1st syringe exchange program (April 4, 2015)

Vulnerability not unique



Peters PJ, Pontones P, Hoover KW, et al. HIV Infection Linked to Injection Use of Oxymorphone in Indiana, 2014–2015. *NEJM*. 2016;375(3):229-239.



The NEW ENGLAND JOURNAL of MEDICINE

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FOR AUTHORS ▾

CME ▸



Perspective

From AIDS to Opioids — How to Combat an Epidemic

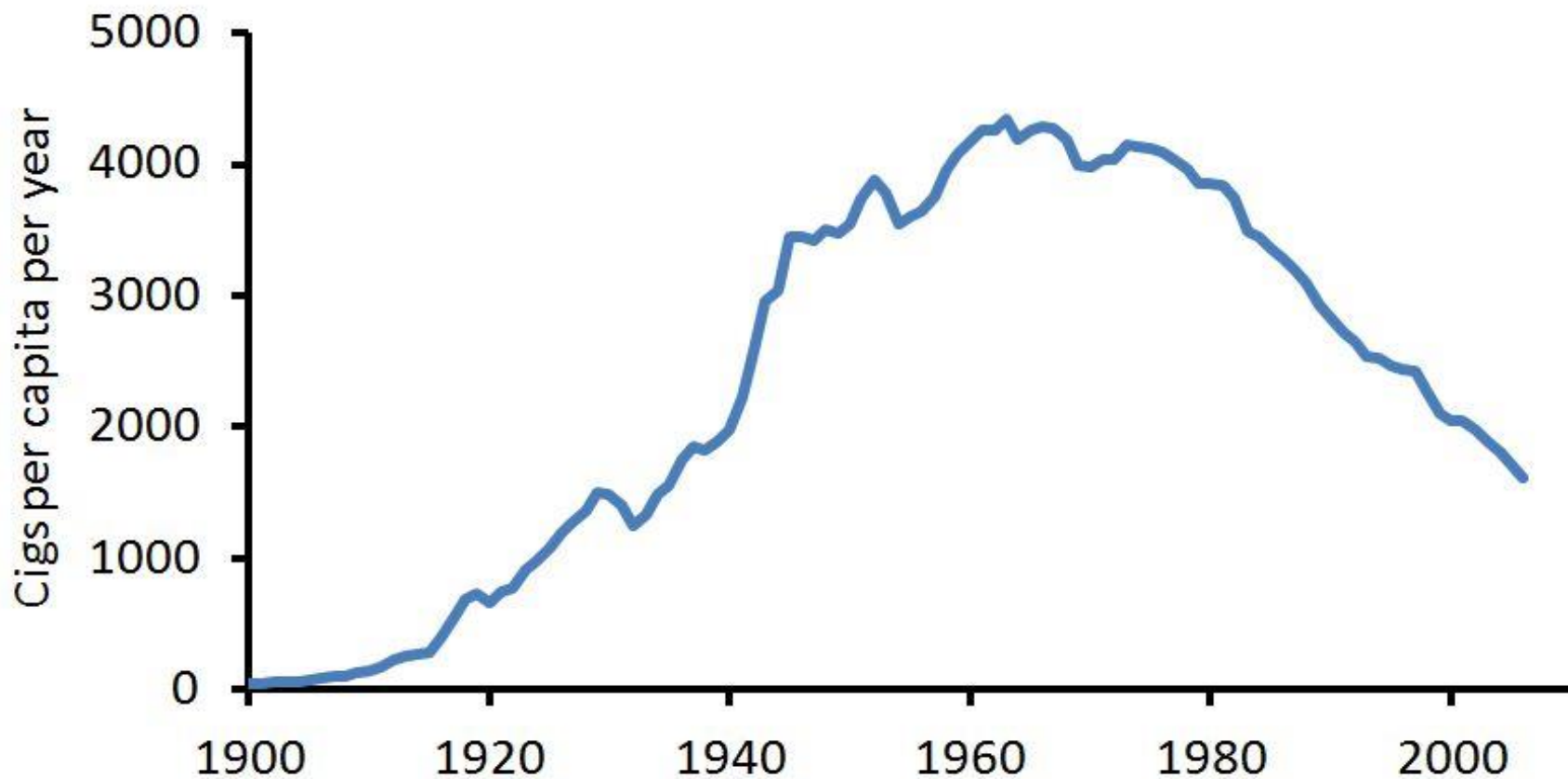
Arthur R. Williams, M.D., M.B.E., and Adam Bisaga, M.D.

N Engl J Med 2016; 375:813-815 | [September 1, 2016](#) | DOI: 10.1056/NEJMp1604223

CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016



US Cigarette Consumption, 1900-2006



latte 4
latte 4.5
mocha coffee 5
espresso 4.5
iced coffee 5
with extras:
milk
cream
chocolate

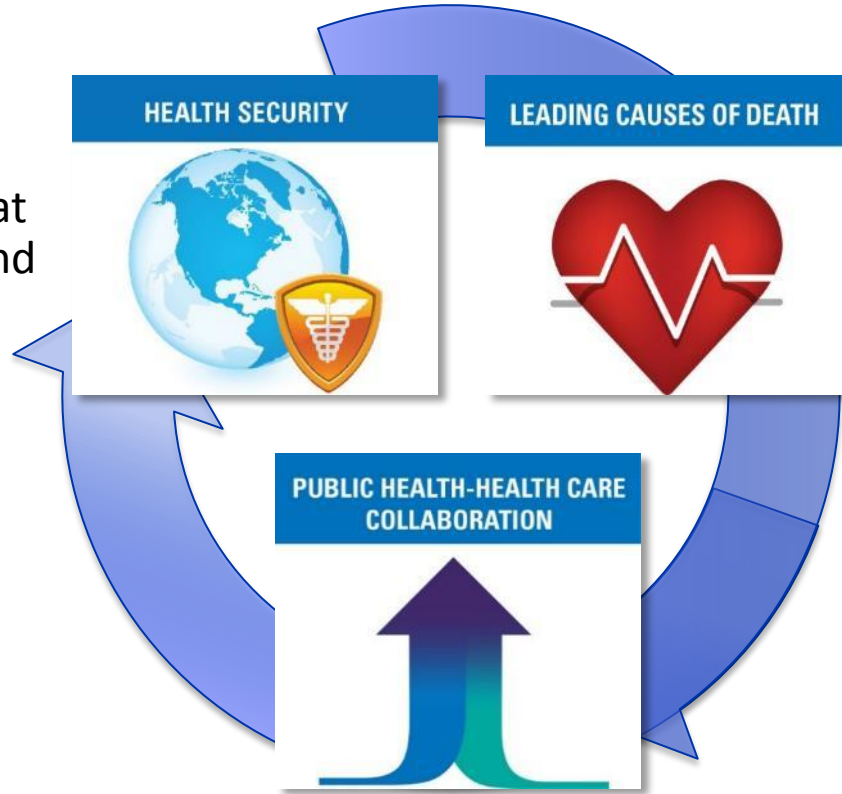
tea 3.5
sweet tea 4
chai latte 4.5
green tea 4
iced tea 5

with boosters:
Flu
Tdap
Varicella
HPV
Zoster
MMR
PCV13
Hib



CDC Strategic Directions

Improve health security at home and around the world



Better prevent the leading causes of illness, injury, disability, and death

Strengthen public health/health care collaboration



CDC Ebola response by the numbers



OVERALL

3,234 Total CDC deployments

>3,940 CDC staff involved in the response

>36,600 Questions answered by CDC's national contact center



DOMESTIC

>32,700 Travelers monitored by health departments

1,423 Domestic clinical inquiries

55 US hospitals designated as Ebola treatment centers

57 US labs approved to test for Ebola



INTERNATIONAL

1,387 CDC staff have deployed to West Africa

>66,000 CDC person work-days in West Africa

>27,000 Samples tested at CDC's lab in Bo, Sierra Leone

24,655 Health workers trained in West Africa

>455,300 Travelers leaving West Africa screened for Ebola

>600 US health workers trained to work in West Africa (Anniston)

8,680 Health and frontline workers enrolled in Ebola vaccine trial

Microcephaly cases linked to Zika virus rise in Brazil

Most of the cases of microcephaly brain defect remain concentrated in Brazil's poor northeastern region

The Associated Press | Posted: Jan 20, 2016 2:08 PM ET | Last Updated: Jan 20, 2016 5:14 PM ET



A health agent from Sao Paulo's public health secretary shows a soldier Aedes aegypti mosquito larvae that she found during clean up operations against the insect that transmits Zika virus. (Andre Penner/Associated Press)



A therapist teaching a mother in Recife, Brazil, last month how to massage her baby, who has microcephaly.

New York Times January 2016

Build a more integrated, effective health system through collaboration between clinical care and public health

High-burden
health conditions

6 | 18

Evidence-based
interventions that can
improve health and
save money

cdc.gov/sixeighteen



SIX WAYS TO SPEND SMARTER FOR HEALTHIER PEOPLE

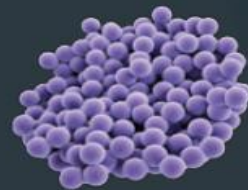
cdc.gov/sixeighteen



**REDUCE
TOBACCO USE**



**CONTROL
BLOOD PRESSURE**



**PREVENT HEALTHCARE-
ASSOCIATED INFECTIONS (HAI)**



CONTROL ASTHMA



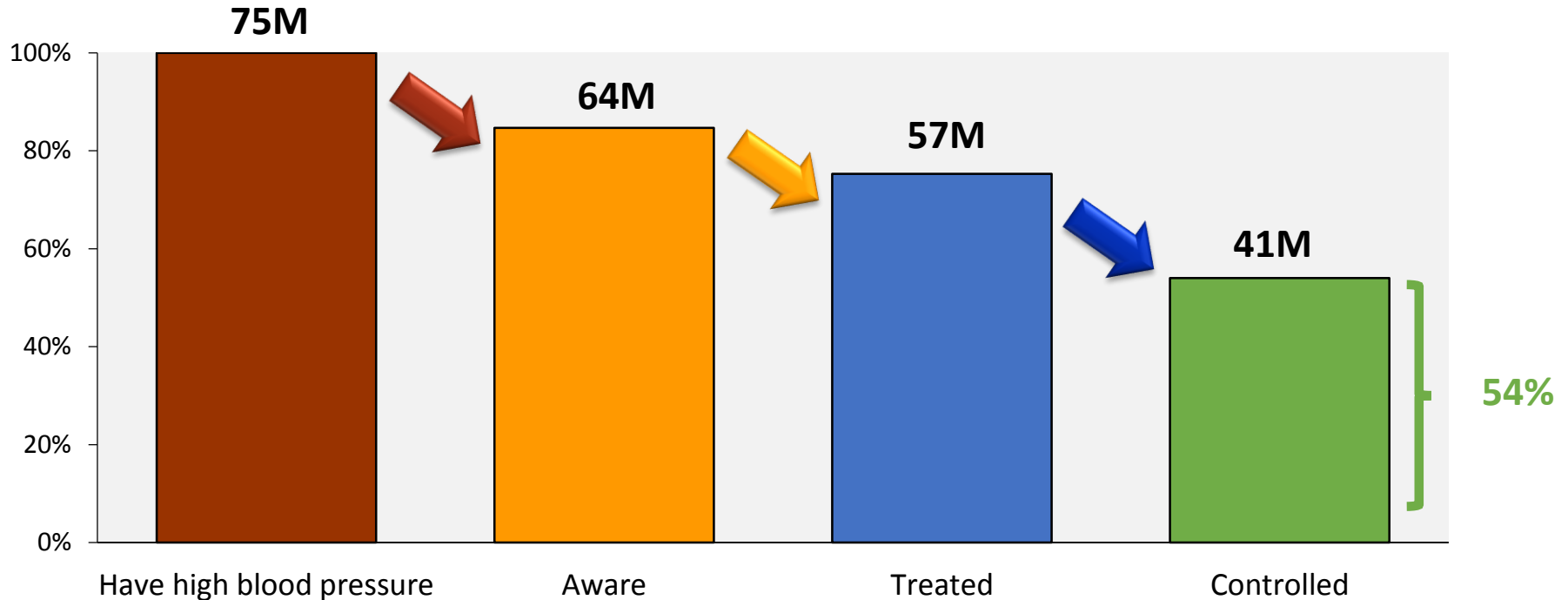
**PREVENT UNINTENDED
PREGNANCY**



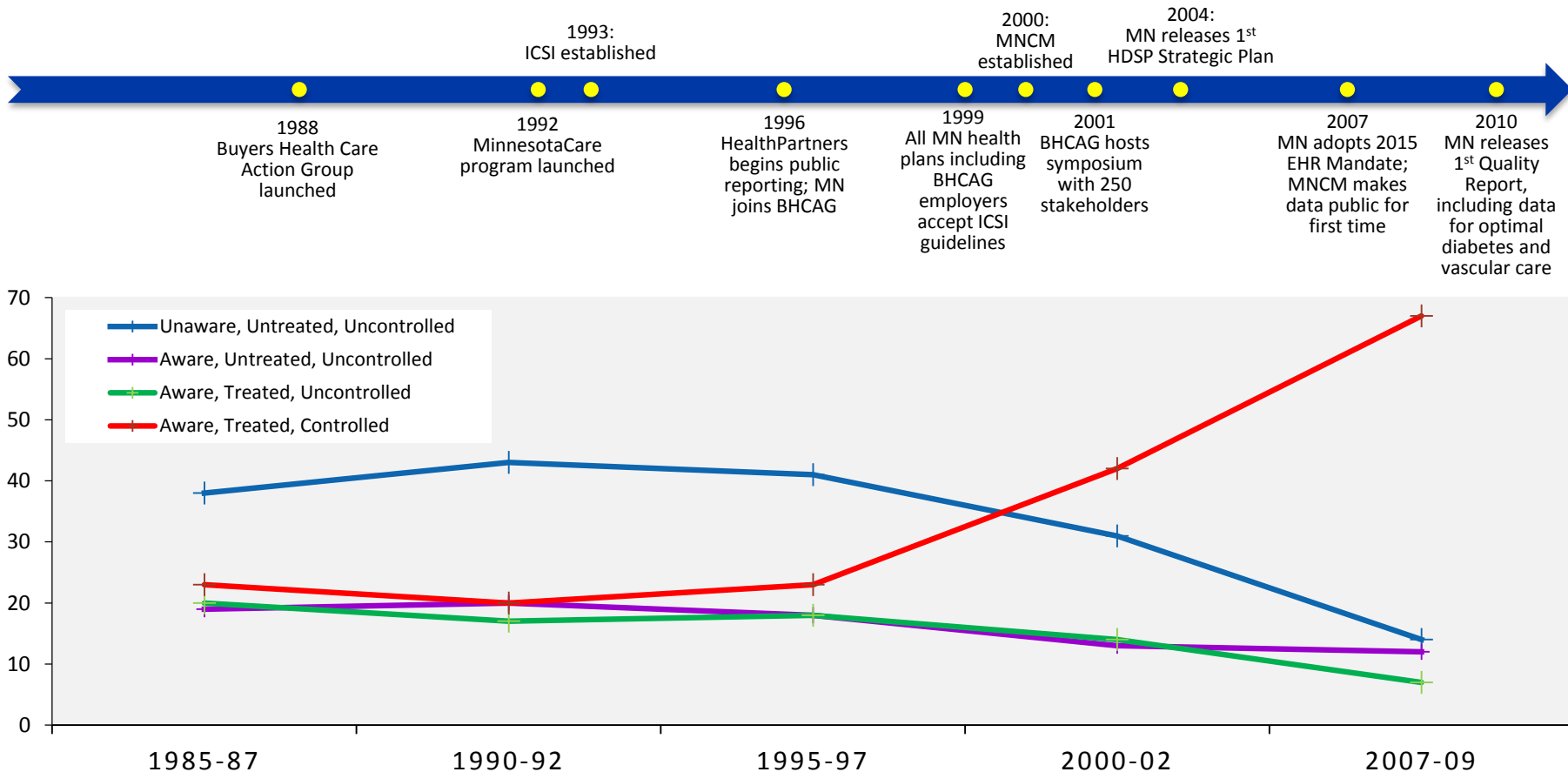
**CONTROL AND
PREVENT DIABETES**

75 million US adults have hypertension

But many are not aware or treated (hiding in plain sight) and only about half have it controlled



Prevalence of Awareness, Treatment, and BP Control, MN Heart Survey (Men 25–74)



Completing the metamorphosis

- **From innovation . . . to implementation**
- **From where it's easy . . . to everyone**
- **From denominators . . . to democracy**
- **From invisible . . . to unforgettable**

