



The Opioid Crisis

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Washington, D.C.

19 January 2018

Yuma Pacific—Southwest Section
43rd Annual Meeting
Bay Club Hotel and Marina
San Diego, California

Papaver somniferum

- **Opiates** are so named because they are constituents or derivatives of constituents found in *opium*, which is processed from the latex sap of the opium poppy, *Papaver somniferum*.
- The major biologically active opiates found in opium are morphine, codeine, heroin, thebaine, and papaverine.



Opiate or Opioid?

- **Opiates**

- Opiates are chemical compounds that are extracted or refined from natural plant matter (poppy sap and fibers).
 - Opium, Morphine, Codeine, Heroin

- **Opioids**

- Opioids are chemical compounds that generally are not derived from natural plant matter. Most opioids are "made in the lab" or "synthesized."
 - Hydrocodone (e.g., Vicodin), Hydromorphone (e.g., Dilaudid), Oxycodone (e.g., Oxycontin, Percocet)
- When people wish to refer to all of drugs derived from opium poppy, they often use the term "opioid."

Categories of Opioid Analgesics

- **Natural opioids**

- Including morphine and codeine



- **Semi-synthetic opioids**

- Including drugs such as oxycodone, hydrocodone, oxycodone, and hydromorphone.

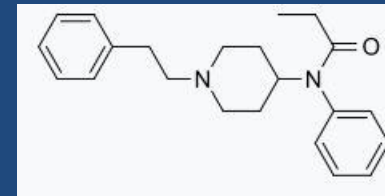
- **Synthetic opioids**

- Methadone

- Synthetic opioid analgesics other than methadone

- Including drugs such as demerol, tramadol, fentanyl, carfentanil

- Carfentanil (Wildnil) used as a general anesthetic agent for large animals, such as elephants.



Mechanism of Action

- Opioid chemicals (endogenous like endorphins or exogenous like oxycodone) interact with one or more subtypes of opioid receptors.
 - Mu (μ), kappa (κ), and delta (δ) opioid receptors represent the originally classified receptor subtypes. Particularly potent agonist activity at the Mu receptor.
- All four receptors are **G-protein** coupled, and activate inhibitory G-proteins to cause analgesia at the level of the the brain, spinal cord, and possible direct effect on peripheral tissue.
 - G-proteins, also known as guanine nucleotide-binding proteins, are a family of proteins that act as molecular switches inside cells, and are involved in transmitting signals from a variety of stimuli outside a cell to its interior.
- Opioid chemicals act by causing pre-synaptic inhibition of neurotransmitter release from C-fibre terminals, post-synaptic inhibition of evoked activity in nociceptive pathways, or disinhibition of other circuits regulating nociceptive transmission.

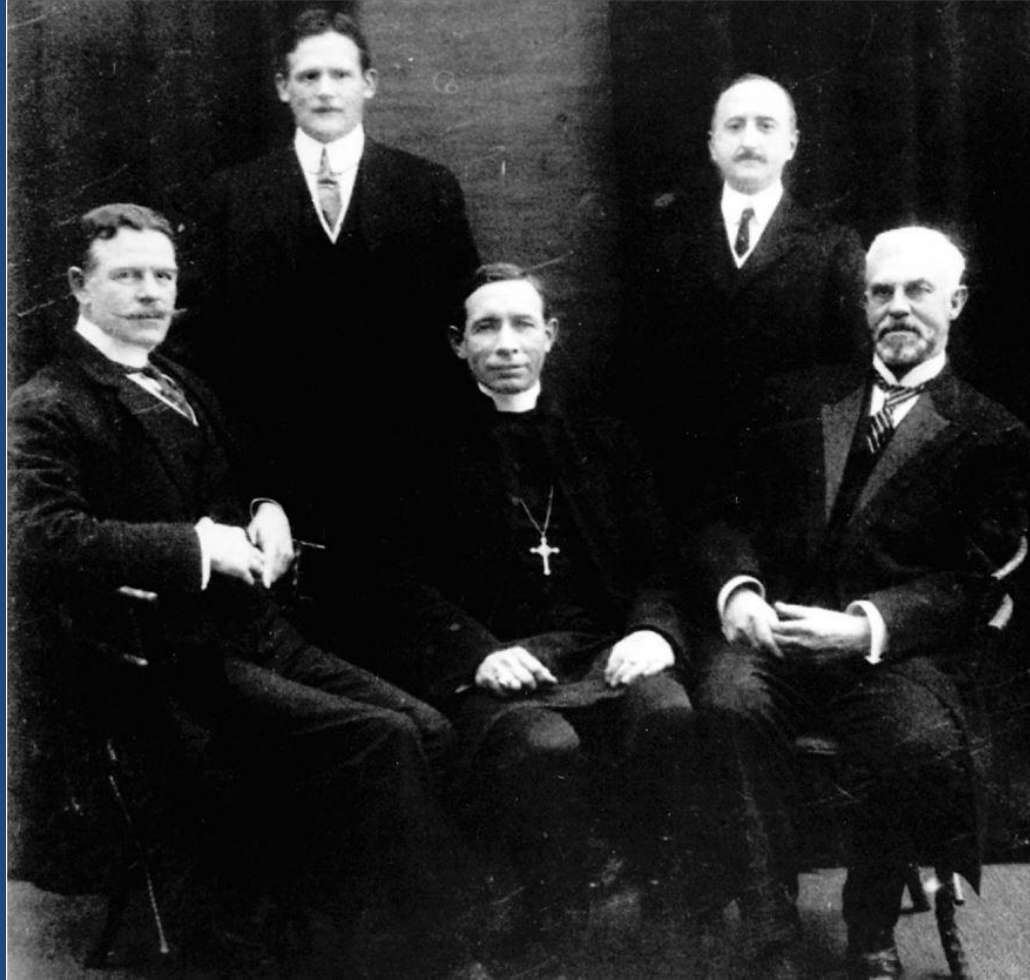
History of Opioids in U.S.

- In decades after Civil War, U.S. developed a narcotics habit when anguished veterans were hooked on morphine.
- Also, genteel “society ladies” dosed up with *Laudanum* — a tincture of alcohol and opium.
- This “wonder drug” was widely used as a cough suppressant
- And it proved very effective at treating diarrhea in children until deaths occurred.



“The Greatest Drug Fiends in the World”

Miroff, N. *Washington Post* (2017) quoting Hamilton Wright in 1908

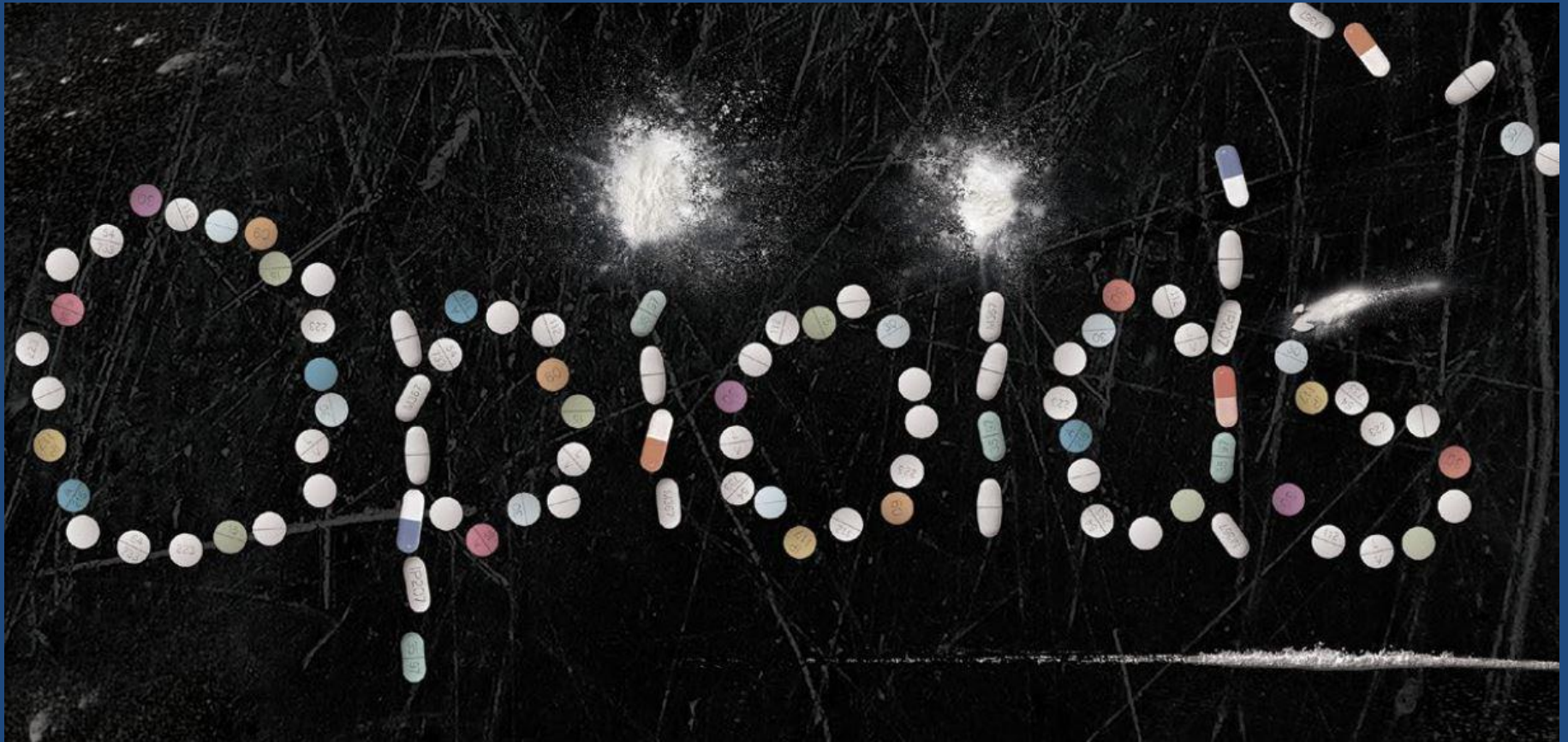


U.S. delegation to the *International Opium Conference* at The Hague in 1912.
America's first Opium Commissioner Hamilton Wright is at left.

Government Reactions

- 1890
 - U.S. government began taxing opium in 1890
- 1906
 - *Pure Food and Drug Act* forced manufacturers to disclose the contents of their products, so consumers wary of the drug would know if it was lurking in their kids' cough syrup or not.
- 1909
 - Congress passed the *Opium Exclusion Act*, banning its import for the purpose of smoking.
- 1914
 - *Harrison Narcotics Tax Act* taxed and tightly regulated the sale and distribution of opium and cocaine-based products, the first broad crackdown
- 1970
 - Controlled Substances Act created 5 Schedules in a hierarchy of production, prescribing and dispensing controls.
 - Tetrahydrocannabinol (THC, **marijuana**) is still considered a **Schedule 1** drug by the DEA, even though some U.S. states have legalized **marijuana** for personal, recreational use or for medical use.

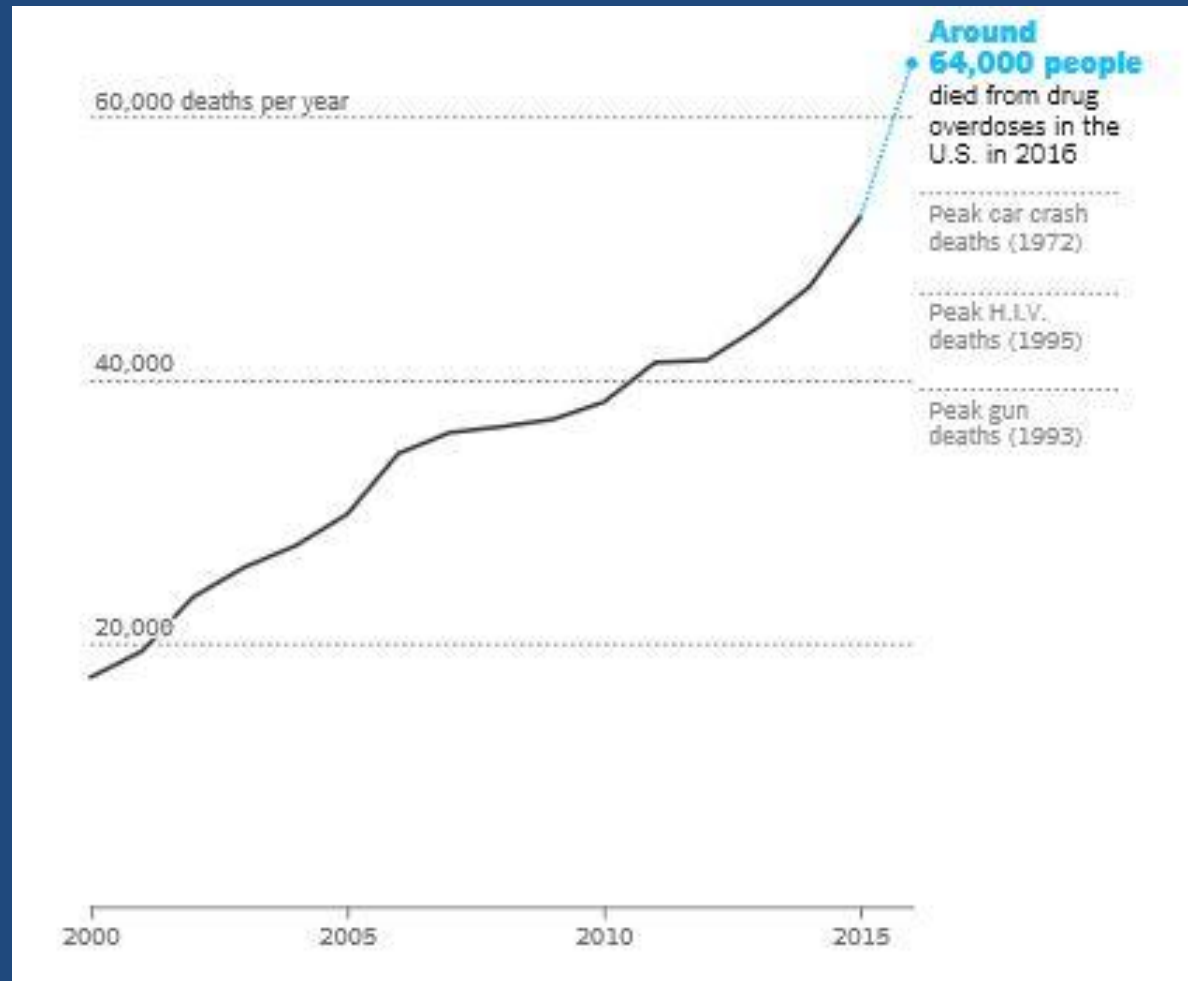
Current Crisis



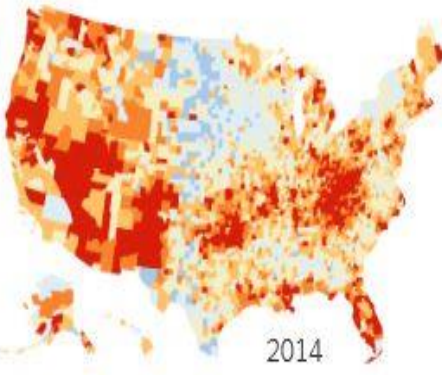
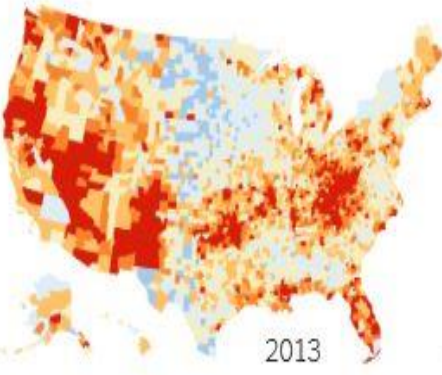
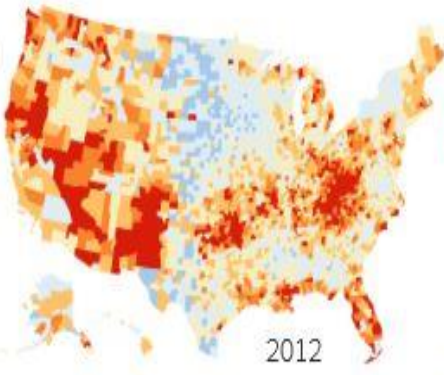
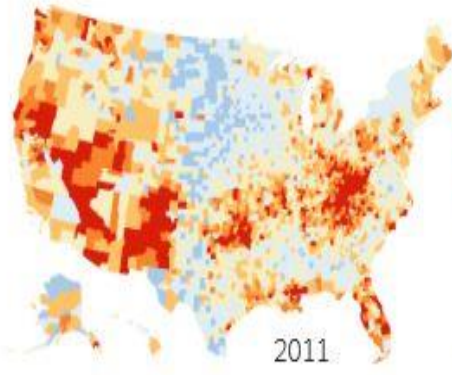
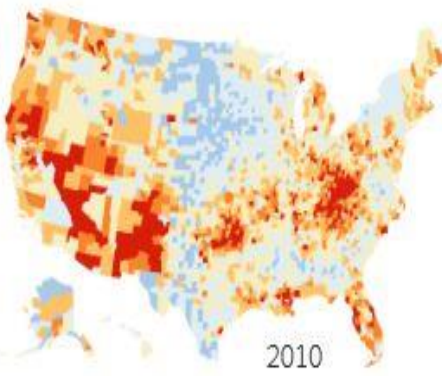
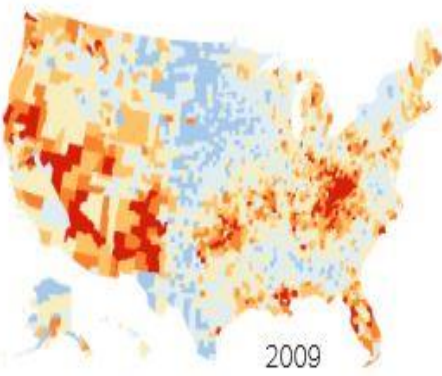
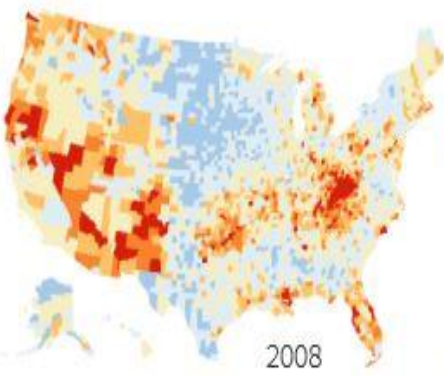
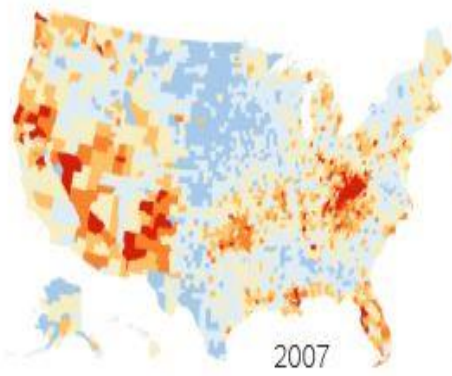
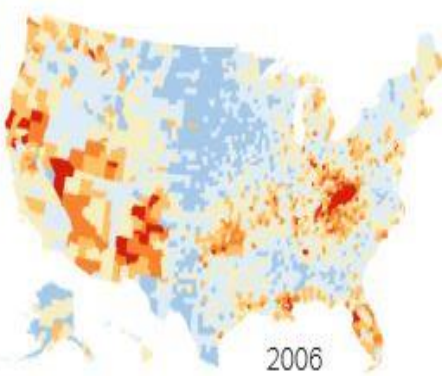
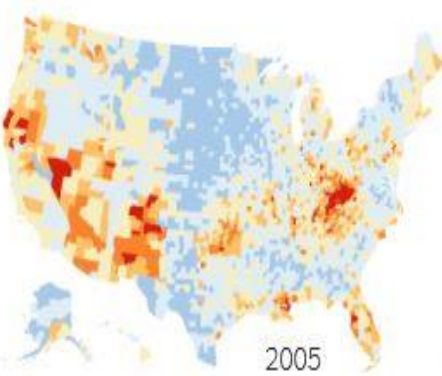
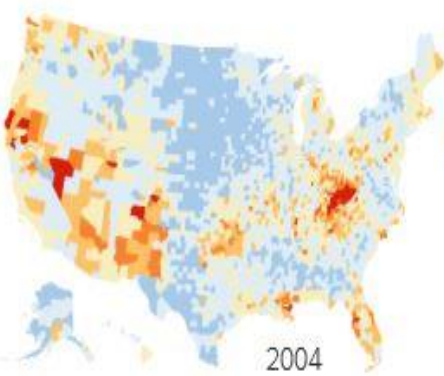
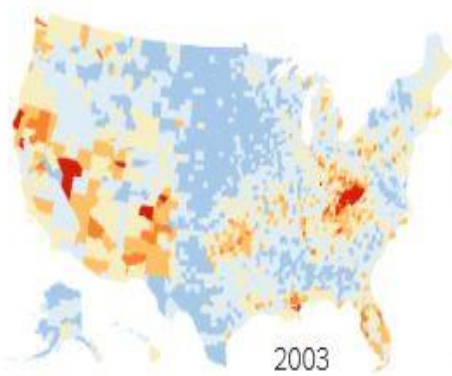
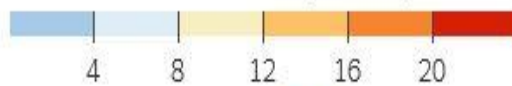
Drug Deaths in America Are Rising Faster Than Ever

Katz, J. *Washington Post* (2017)

- 59,000 to 65,000 people died from drug overdoses in US in 2016.
- Death count is the latest consequence of an escalating public health crisis: opioid addiction.
- Made more deadly by an influx of illicitly manufactured fentanyl and similar drugs.
- Drug overdoses are now the leading cause of death among Americans under 50.

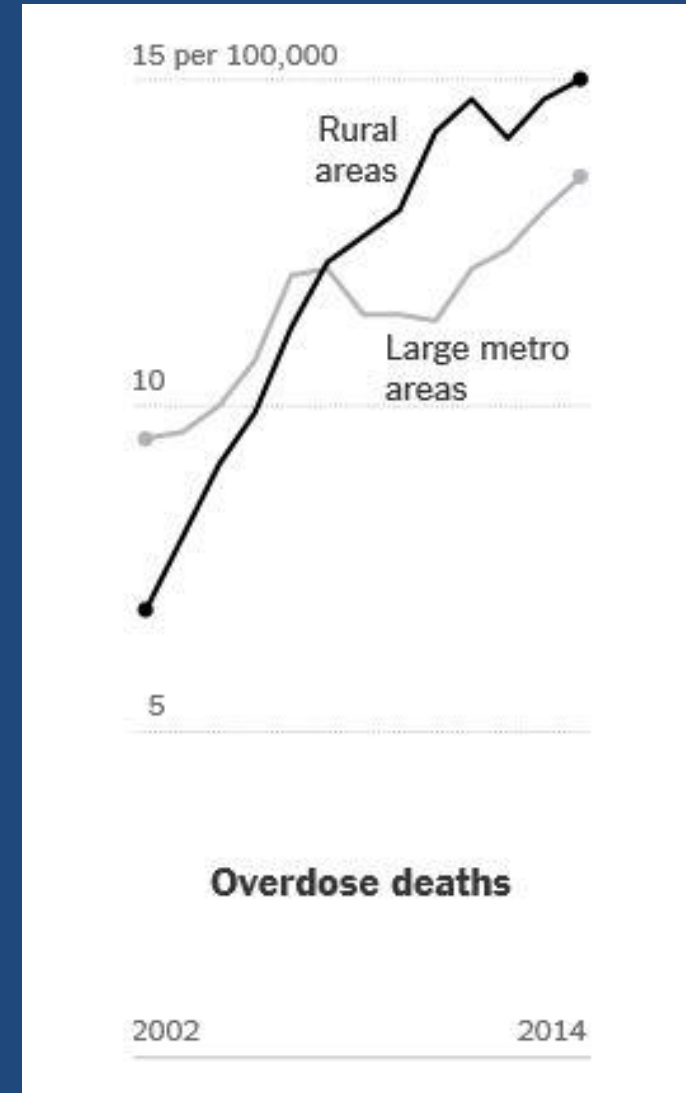


Overdose deaths per 100,000

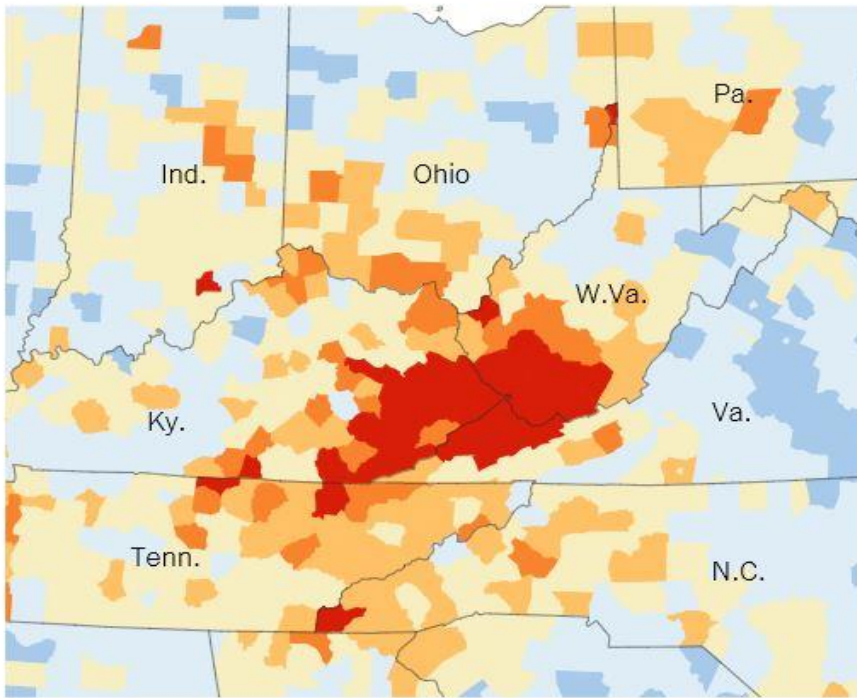


Drug Overdose Deaths— Rural vs. Urban

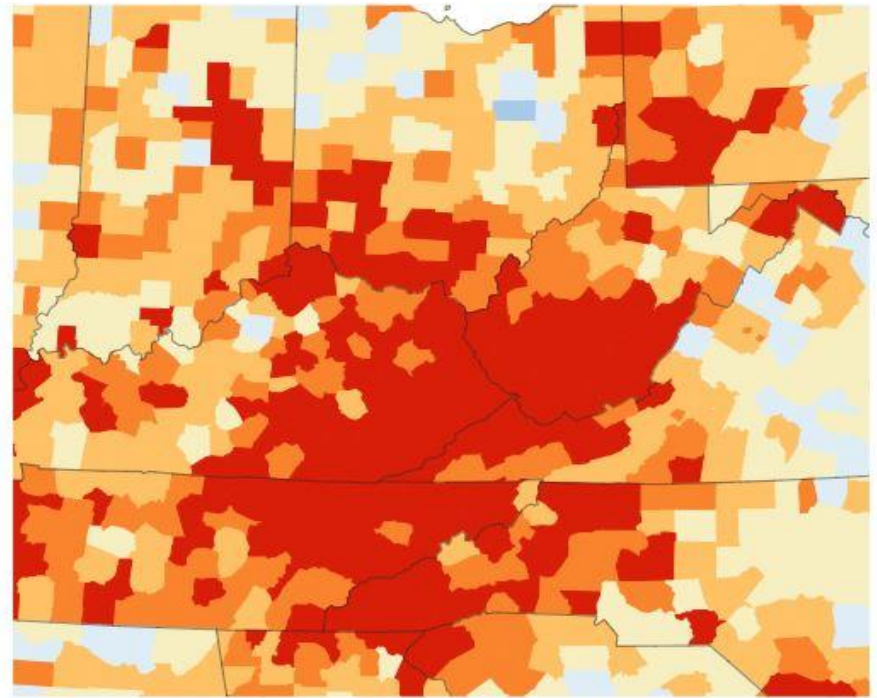
- Death rates from overdoses in rural areas now outpace the rate in large metropolitan areas, which historically had higher rates.
 - Sources: “Drug Poisoning Mortality: United States, 2002–2014” by Lauren M. Rossen, Brigham Bastian, Margaret Warner, Diba Khan and Yinong Chong, National Center for Health Statistics, Centers for Disease Control and Prevention



Workplace injuries may drive rising addiction in Appalachia.



2003

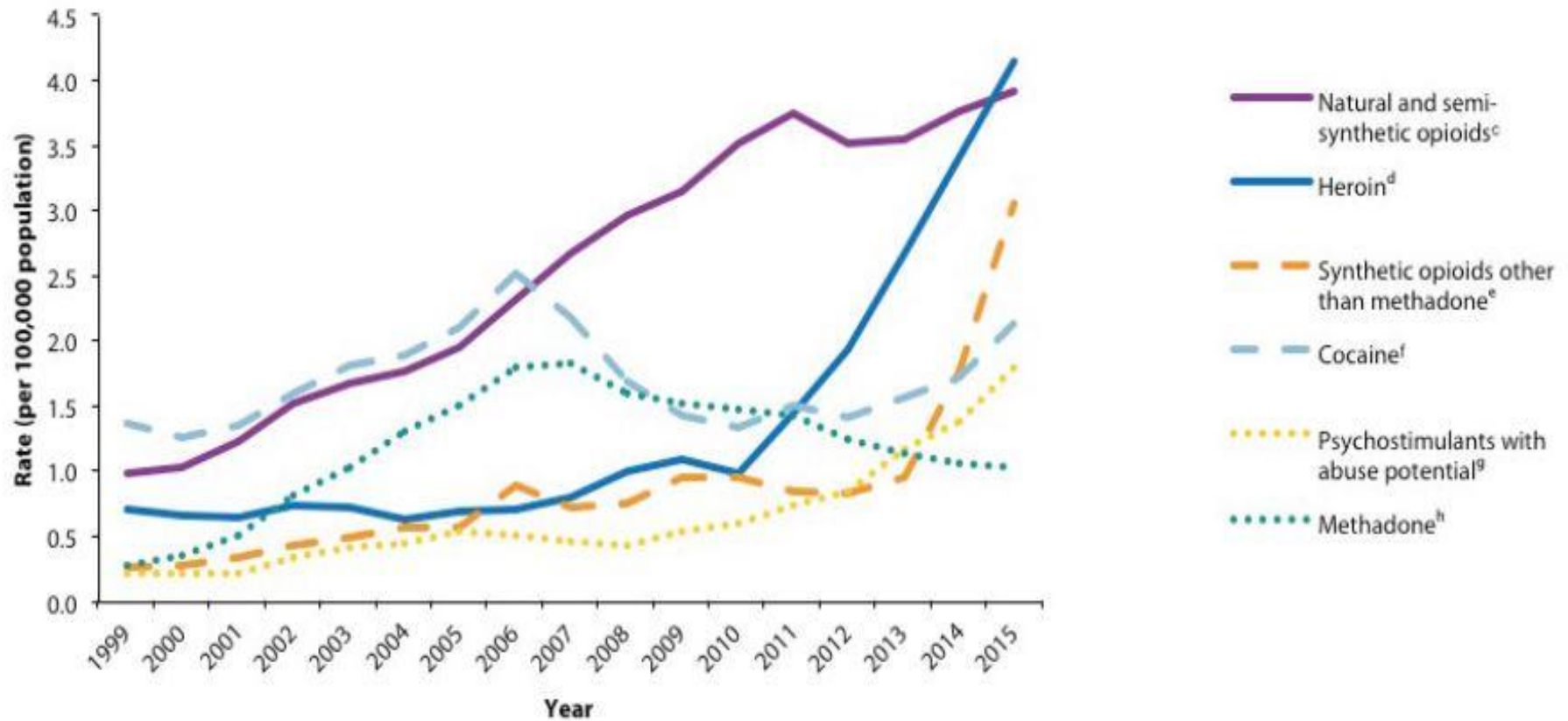


2014

- Appalachia has been stricken with overdose deaths for more than a decade, in many ways because of prescription drug addiction among blue-collar workers with work-related injuries.

- Carl Sullivan, M.D., Director Addiction Services, WVU School of Medicine

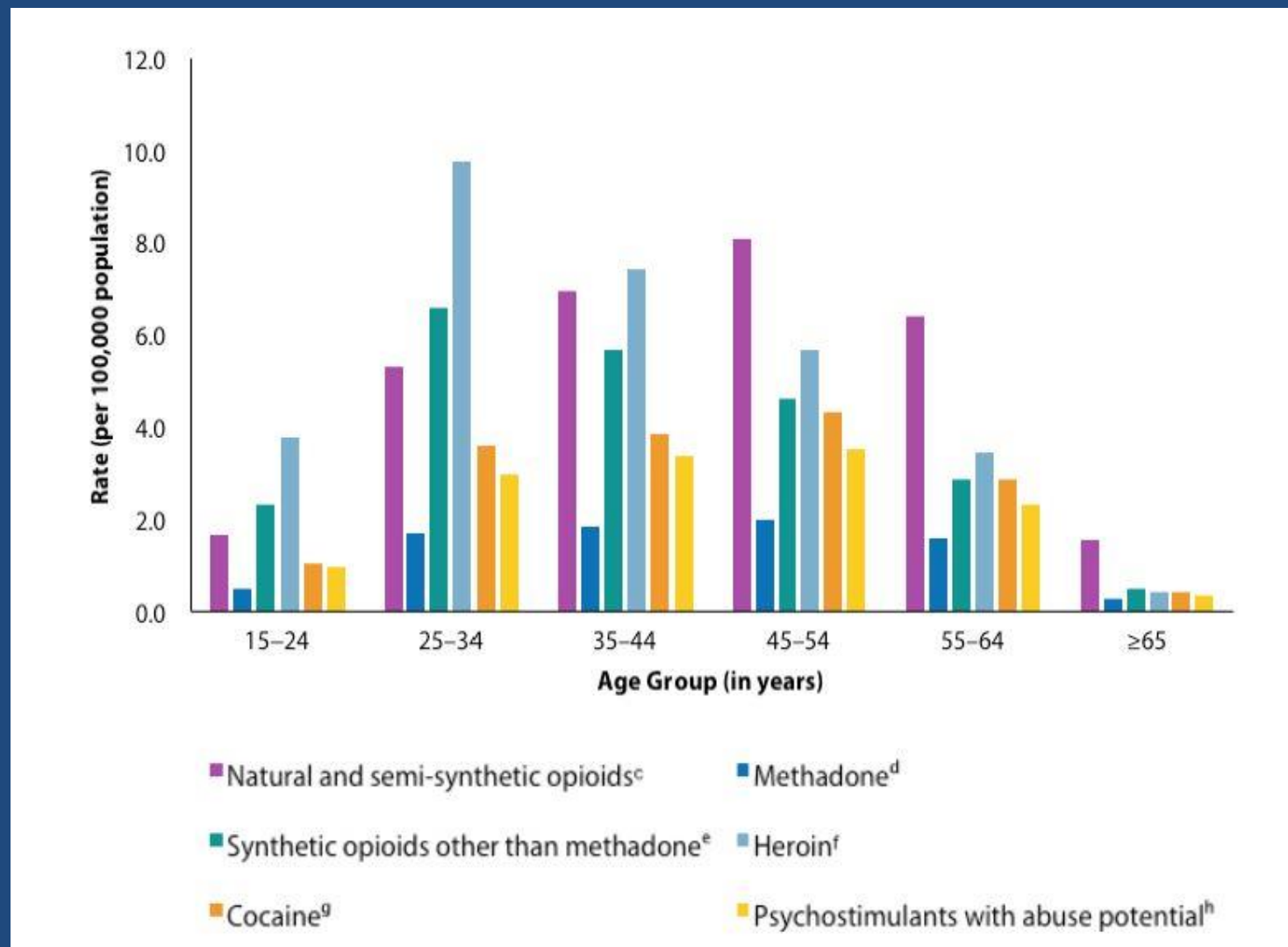
Age-adjusted Rates of Drug Overdose Deaths, by drug or drug class and year — United States, 1999–2015



- CDC Annual Surveillance Report of Drug-Related Risks and Outcomes — United States, 2017. Surveillance Special Report 1.

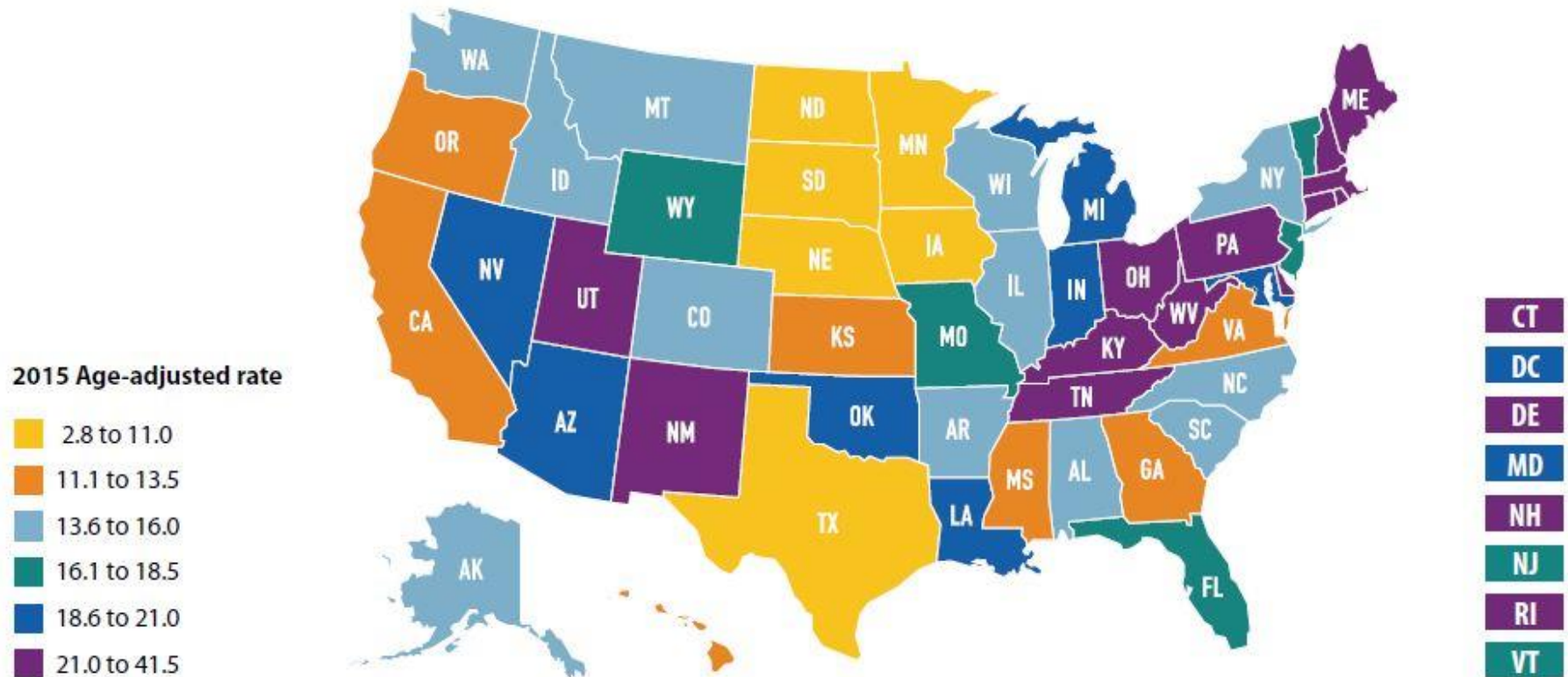
Age-adjusted Rates of Drug Overdose Death,

by drug or drug class and age category — United States, 2015



— CDC Annual Surveillance Report of Drug-Related Risks and Outcomes — United States, 2017. Surveillance Special Report 1.

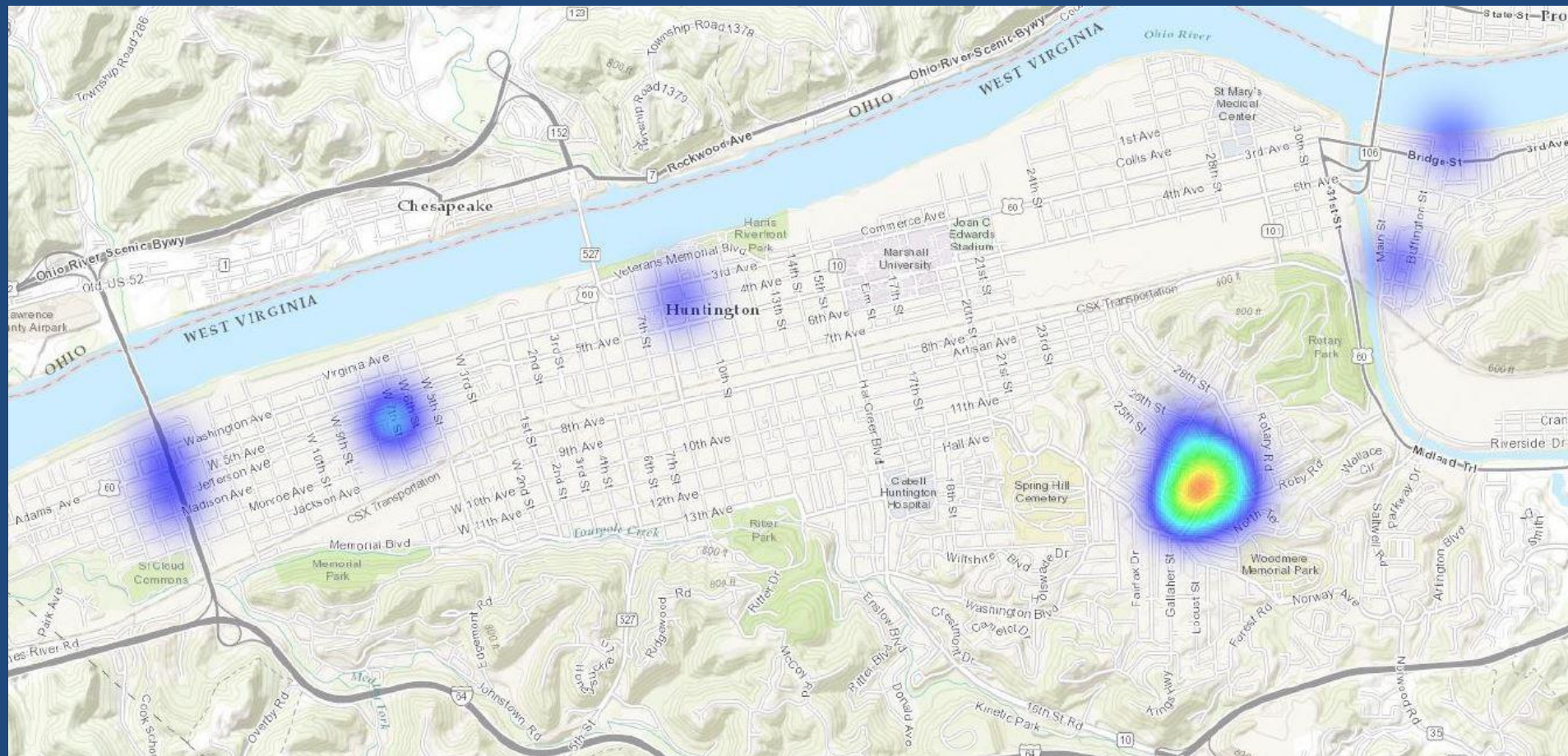
Age-adjusted Rates of Drug Overdose Deaths, by state — United States, 2015



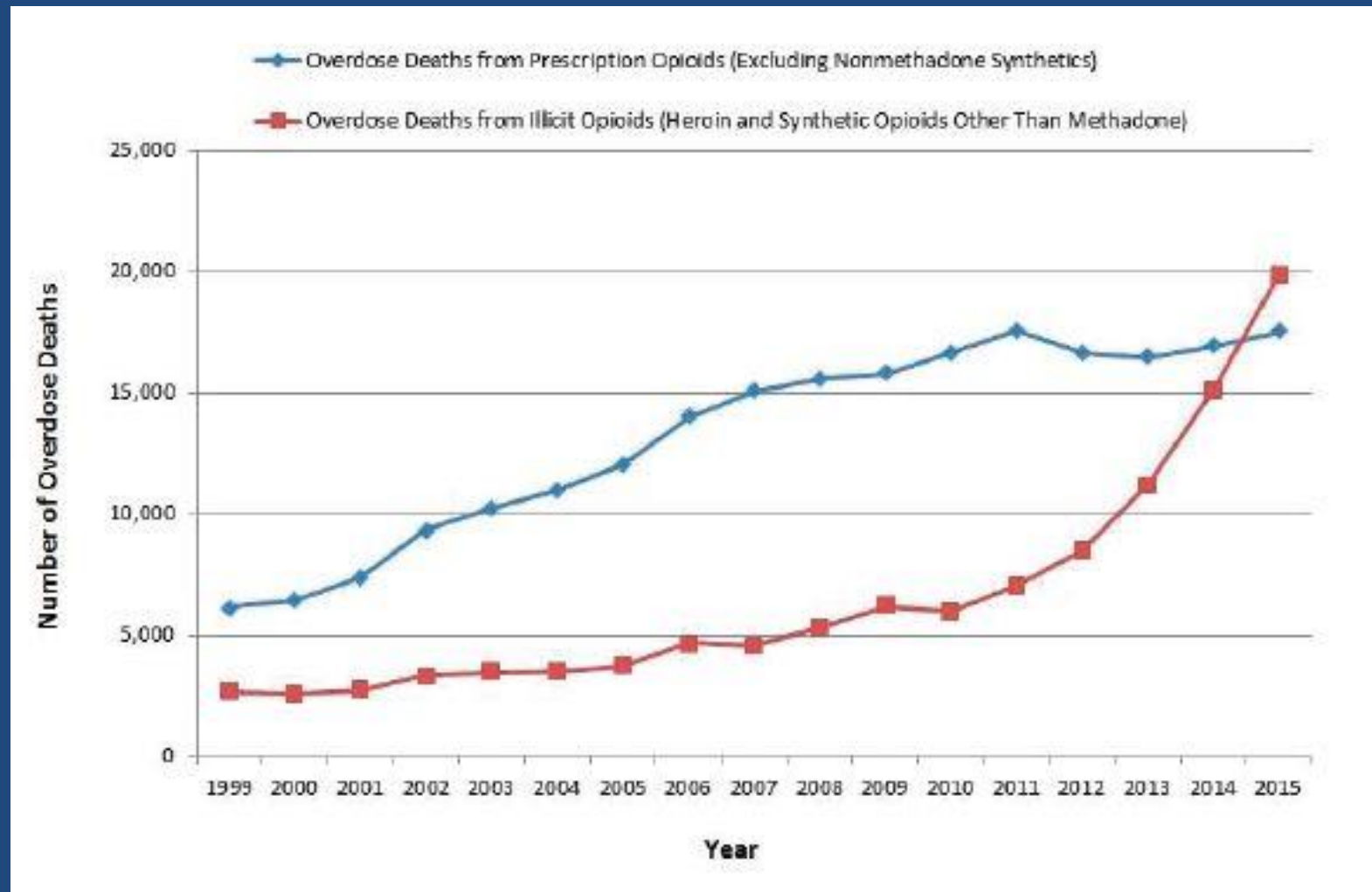
— CDC Annual Surveillance Report of Drug-Related Risks and Outcomes — United States, 2017. Surveillance Special Report 1.

Cabell County, West Virginia

- On August 16, 2016, there were 26 opioid-related overdoses within five hours in Cabell County, and later reports attributed two deaths to the event related to heroin adulterated with high-potency opioids like fentanyl.



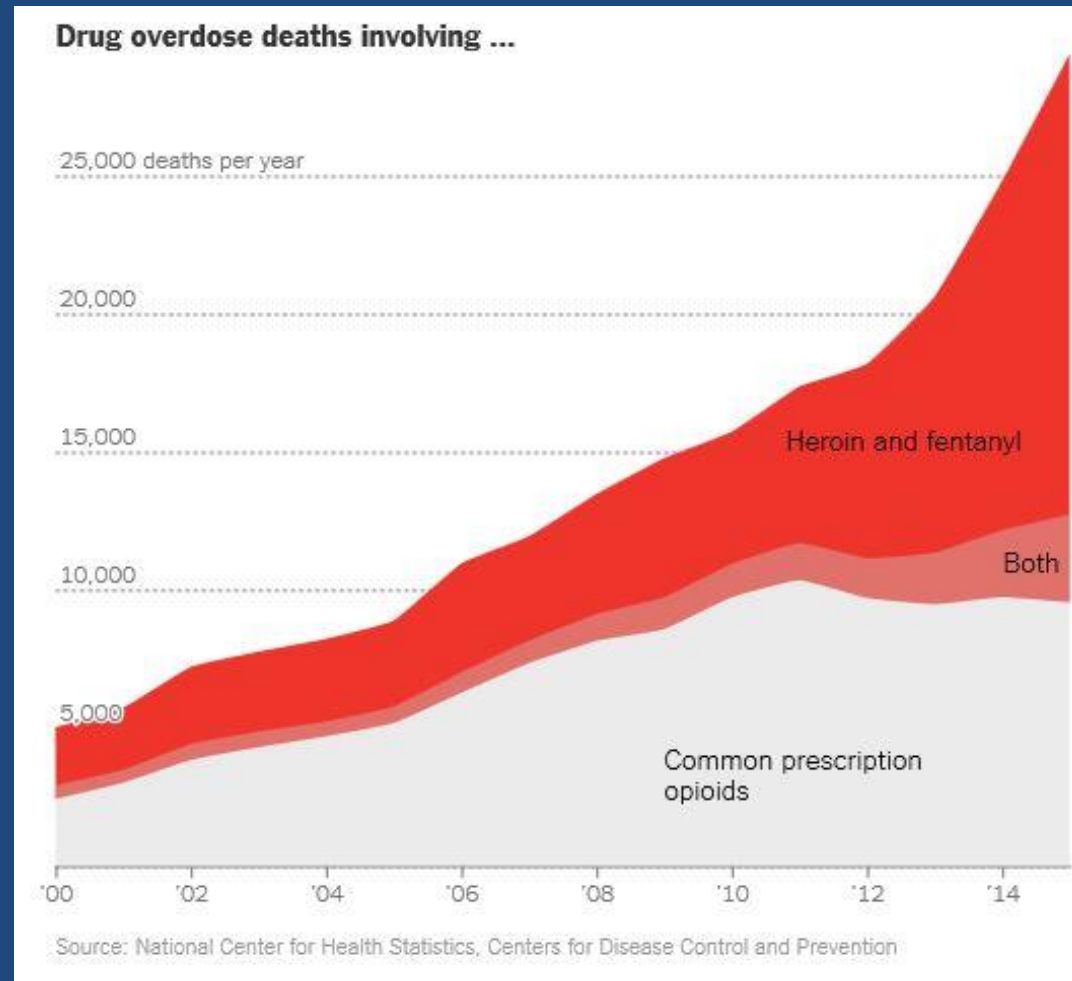
Is it a Prescription or Illicit Drug Crisis?



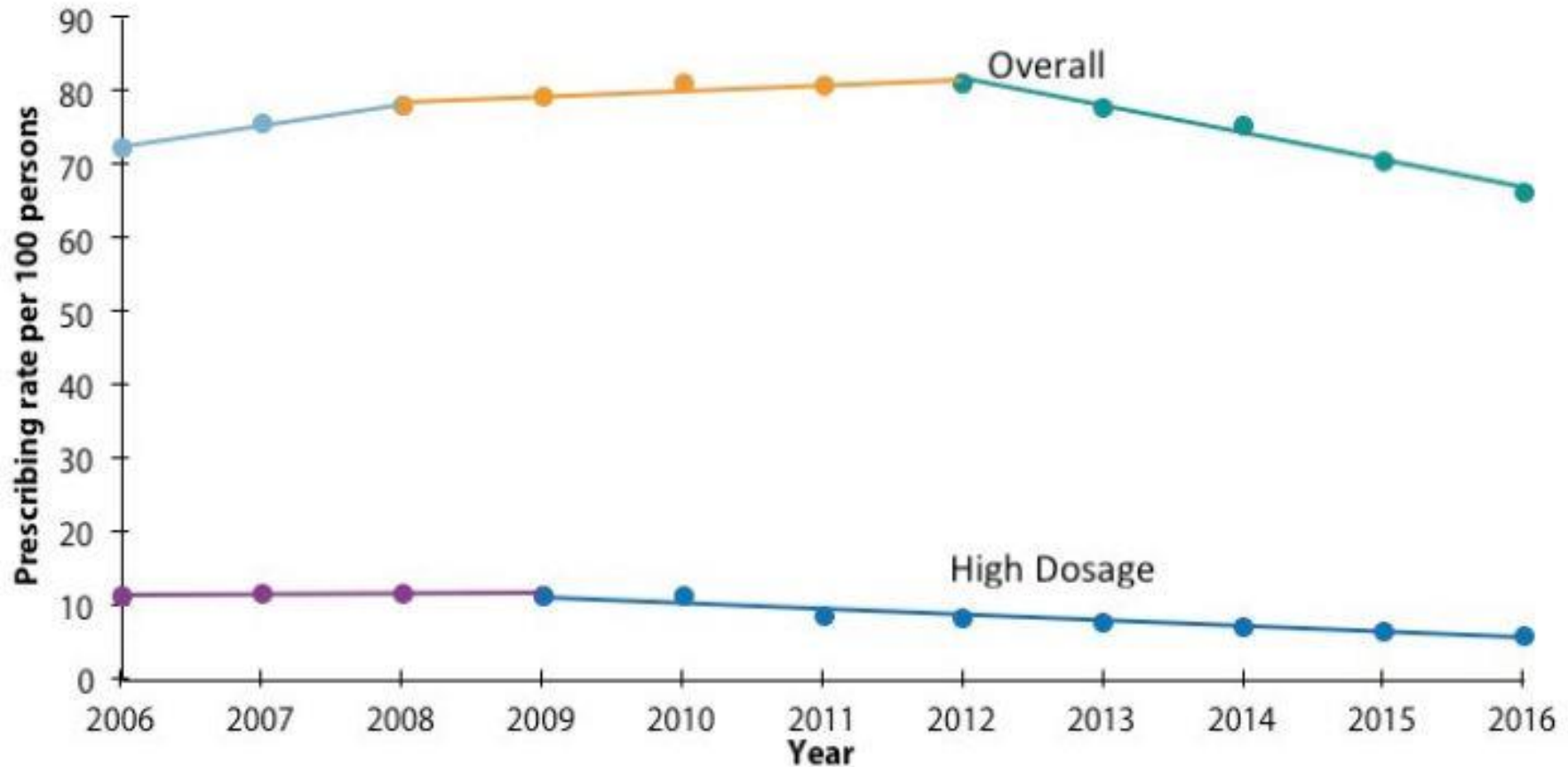
- National Academies of Sciences, Engineering, and Medicine. 2017. *Pain management and the opioid epidemic: Balancing societal and individual benefits and risks of prescription opioid use*. Washington, DC: The National Academies Press. doi: <https://doi.org/10.17226/24781>.

Prescription or Illicit?

- The crisis has its roots in the over-prescription of opioid painkillers, but since 2011 overdose deaths from prescription opioids have leveled off.
- Deaths from heroin and fentanyl, on the other hand, are rising fast.
- In several states where the drug crisis is particularly severe fentanyl is now involved in over half of all overdose fatalities.



Opioid Prescribing Down



— CDC Annual Surveillance Report of Drug-Related Risks and Outcomes — United States, 2017. Surveillance Special Report 1.

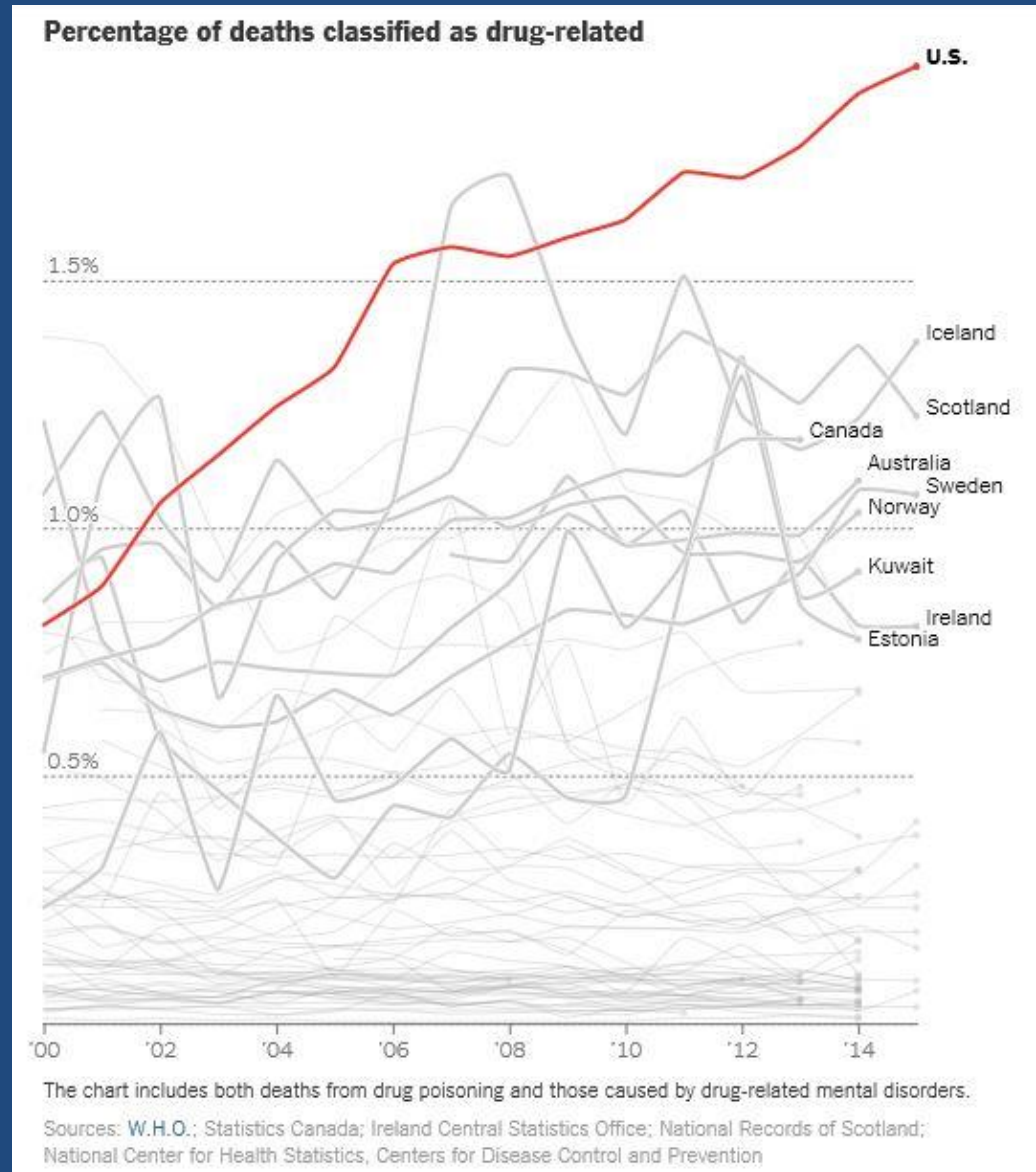
U.S. vs Other Countries

International Comparisons

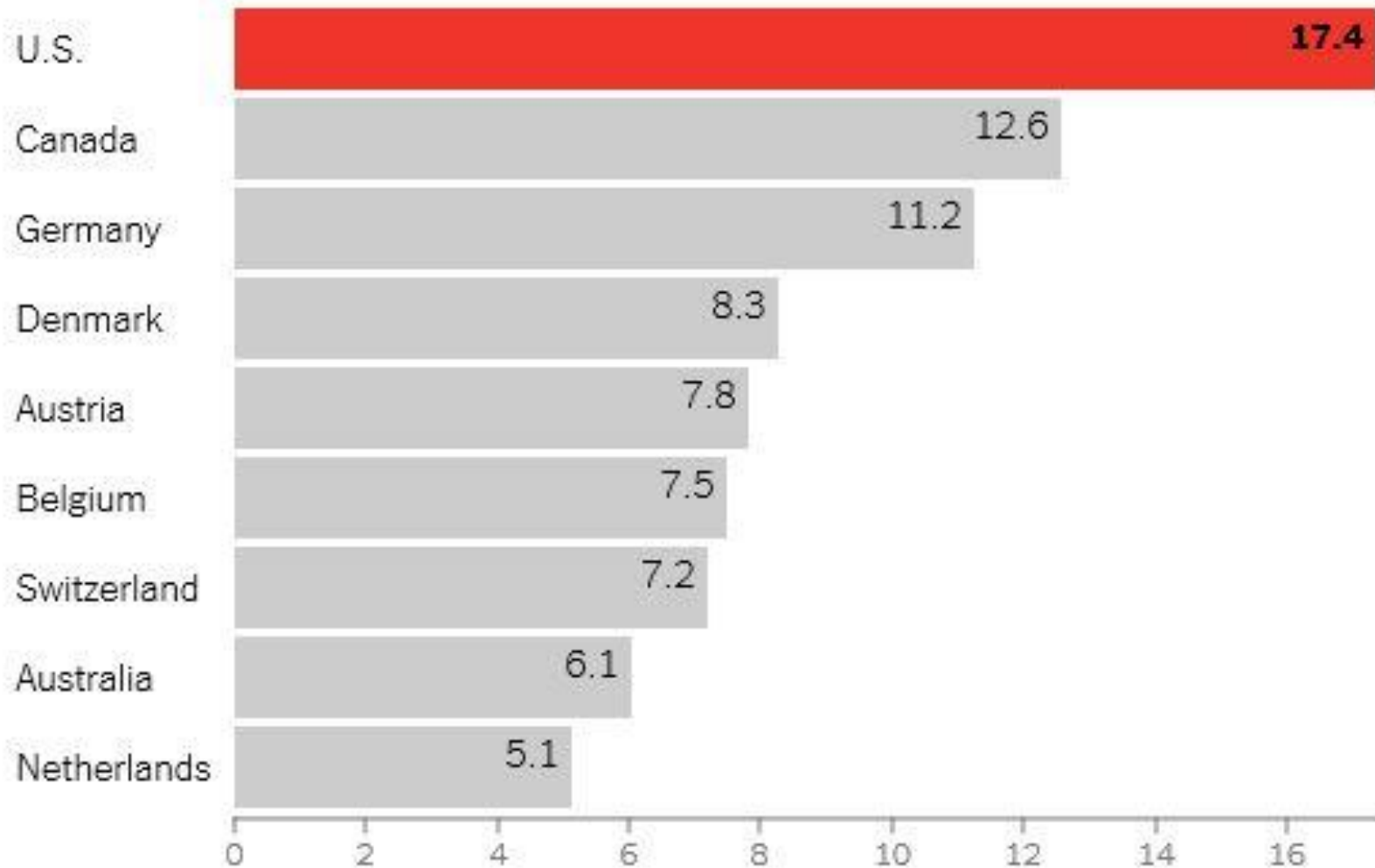
- Historically, U.S. has consumed a large majority of the world's supply of opioid drugs.
 - 80 percent of the world's supply of opioid drugs (Manchikanti and Singh, 2008).
 - 90 percent of the world's supply of morphine, fentanyl, and oxycodone was used in the United States, Canada, Australia, and New Zealand in 2009, and in that same year, the United States consumed 83 and 99 percent of the world's oxycodone and hydrocodone, respectively (Hauser et al., 2016).
- Based on available data (UNODC, 2017), other countries, including Mexico and countries in Central and South America, Africa, and Asia, appear to have a considerably lower prevalence of past-year use of both prescription and illicit opioids, although this does not necessarily mean that these countries are free of problems related to opioids.

International Comparisons

- How bad is it?
- Drug overdoses are the leading cause of death for Americans under 50, and deaths are rising faster than ever, primarily because of opioids.
- Overdoses killed more people last year than guns or car accidents, and are doing so at a pace faster than the AIDS epidemic at its peak.
- In 2015, roughly 2 percent of deaths — one in 50 — in the United States were drug-related.



Average Days of Opioid Use Per Resident



Values are three-year rolling averages for 2013 to 2015.

Source: International Narcotics Control Board

Life Expectancy

Rising Morbidity and Mortality

Case & Deaton, PNAS (2015)

- Marked increase in the all-cause mortality of middle-aged white non-Hispanic men and women in the United States between 1999 and 2013.
- This change reversed decades of progress in mortality and was unique to the US.
- The midlife mortality reversal was confined to white non-Hispanics; black non-Hispanics and Hispanics at midlife, and those aged 65 and above in every racial and ethnic group, continued to see mortality rates fall.

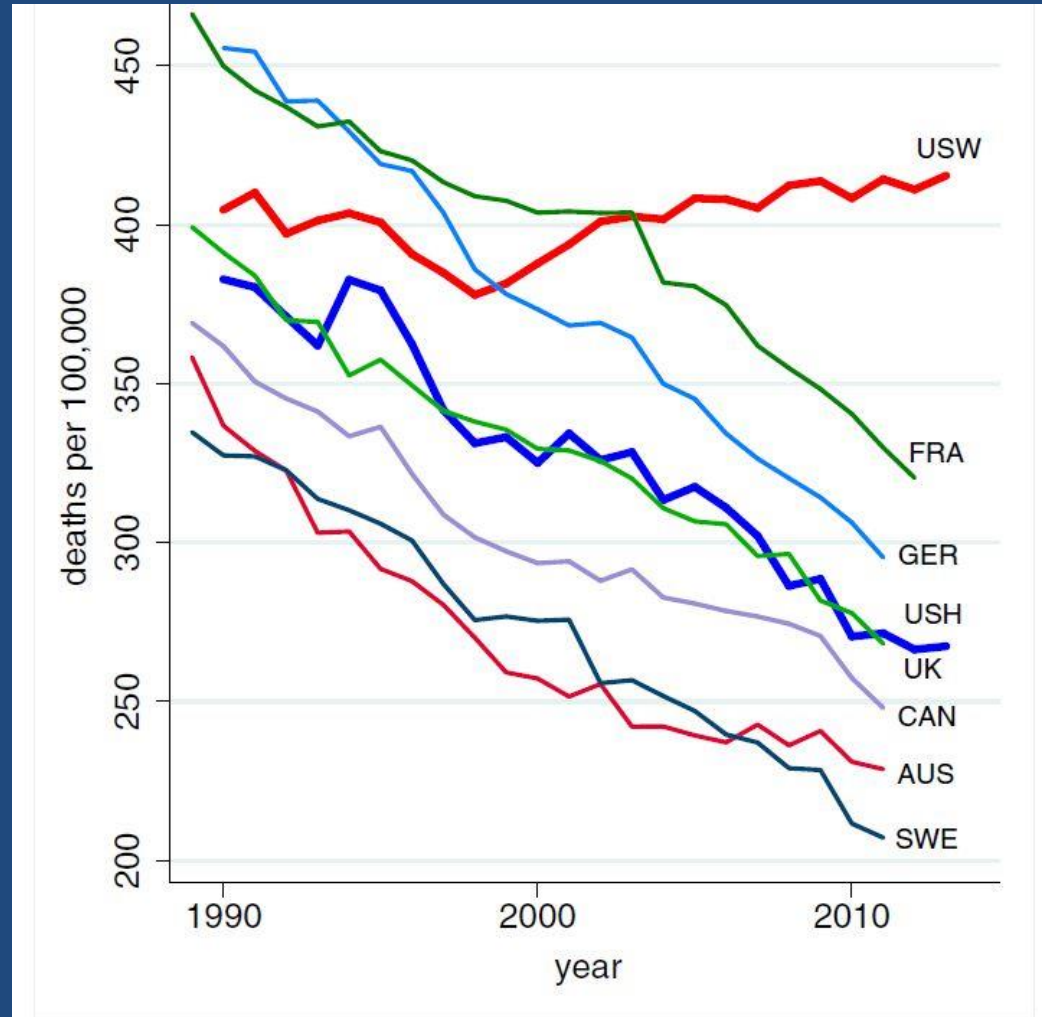
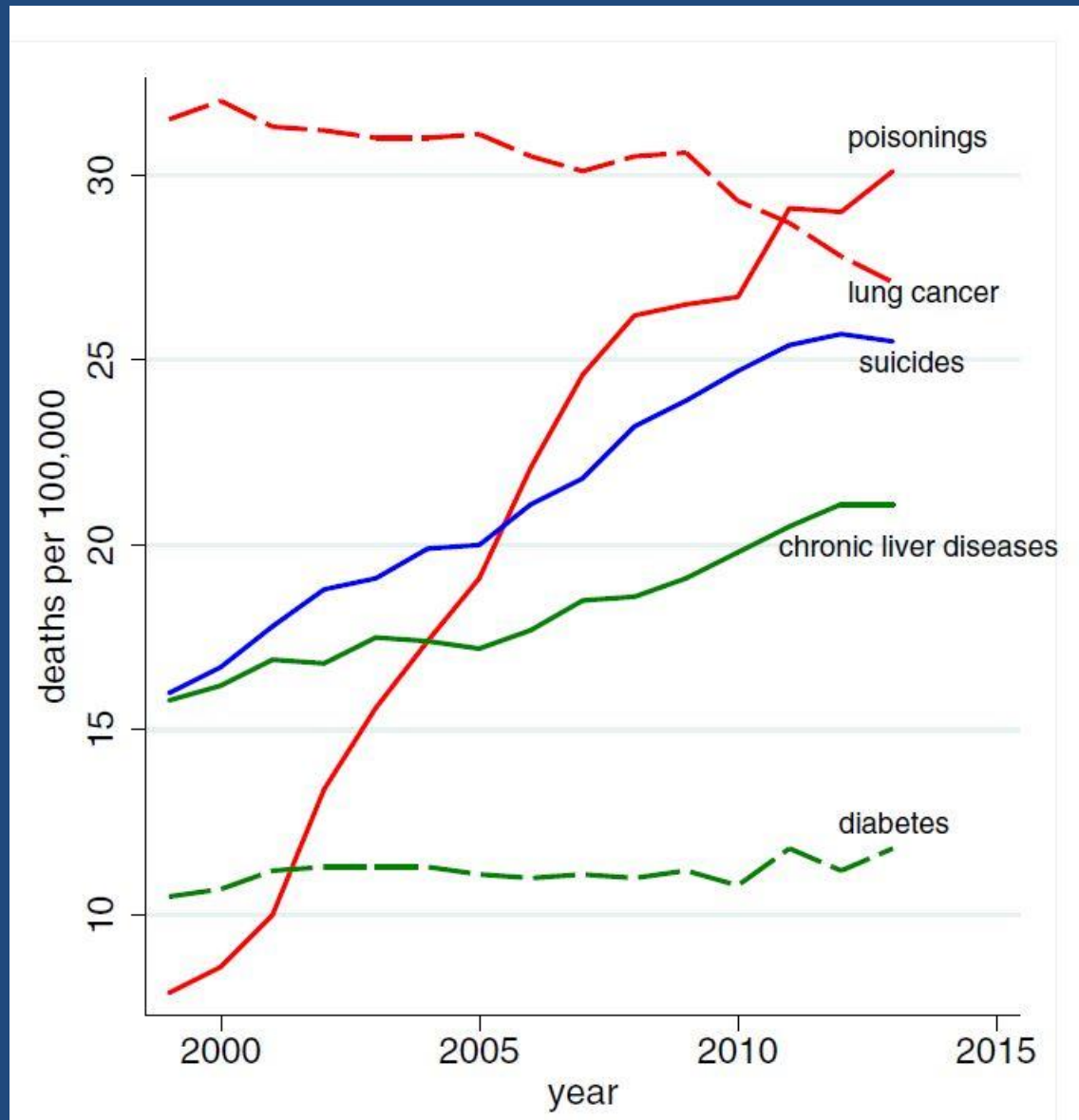


Fig. 1. All-cause mortality, ages 45–54 for US White non-Hispanics (USW), US Hispanics (USH), and six comparison countries: France (FRA), Germany (GER), the United Kingdom (UK), Canada (CAN), Australia (AUS), and Sweden (SWE).

Rising Morbidity and Mortality

- Mortality increase for whites was largely accounted for by increasing death rates from drug and alcohol poisonings, suicide, and chronic liver diseases and cirrhosis



Change in Life Expectancy: U.S. 2000-2015

Dowell, D. et al. JAMA (2017)

- Drug poisoning mortality more than doubled in the United States from 2000 to 2015 and poisoning mortality involving opioids more than tripled.
- Increases in poisonings have been reported to have reduced life expectancy for non-Hispanic white individuals in the U.S. from 2000 to 2014.

Change in Life Expectancy: U.S. 2000-2015

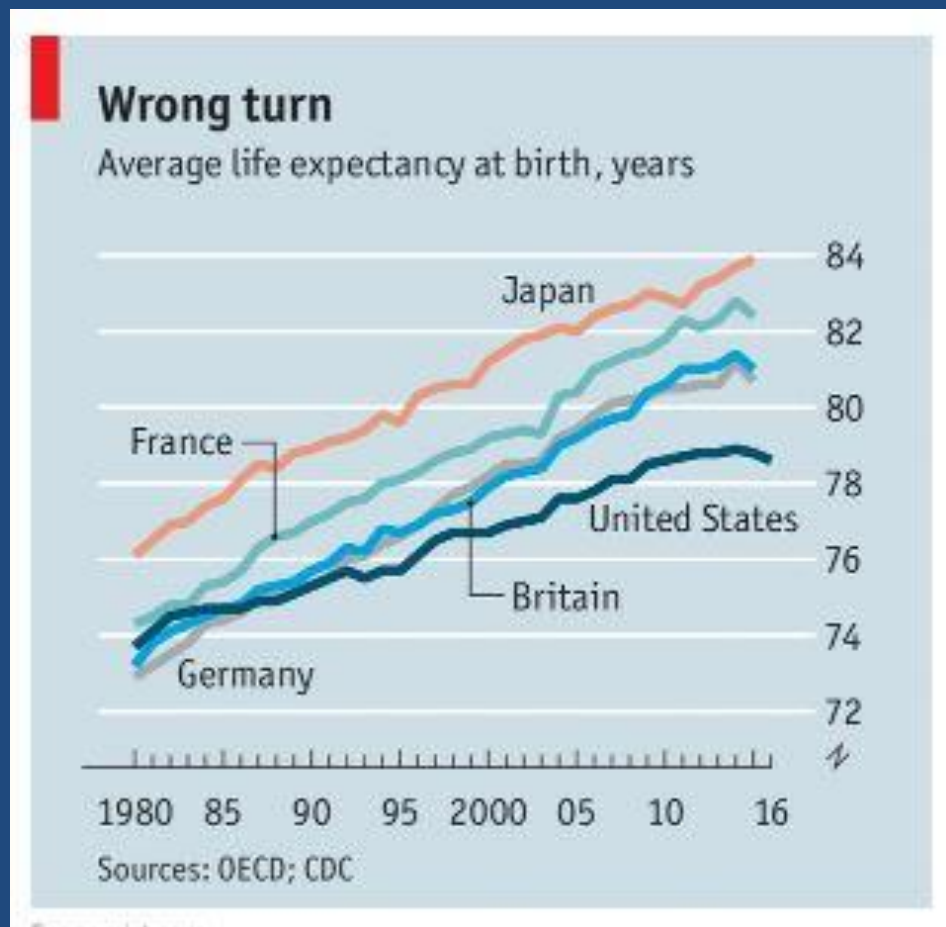
Dowell, D. et al. JAMA (2017)

- Increases in U.S. life expectancy at birth have
 - from a mean of 0.20 years gained annually from 1970 to 2000
 - to 0.15 years gained annually from 2000 to 2014.
- U.S life expectancy is now lower than in most high-income countries, with this gap projected to increase.
- Preventing opioid-related poisoning deaths will be important to achieving more robust increases in life expectancy once again.

U.S. Life Expectancy Declines Again

CDC, Mortality in U.S. in 2016 (December 2017)

- An American baby born in 2016 can expect to live on average 78.6 years, down from 78.9 in 2014.
- Leading causes of death in 2016 remained heart disease and cancer. But a category called “unintentional injuries”, which includes drug overdoses, climbed to third place—from fourth place in 2015 and fifth place in 2012.
- Although unintentional injuries caused just 6% of deaths in 2016, they claim mostly people in the prime of their lives. A young person’s death cuts average life expectancy by more than the death of an older person.



How Did This Crisis Happen?

- Drug companies reassured doctors that patients would not become addicted to prescription opioid pain relievers, and healthcare providers began to prescribe them at greater rates.
 - Purdue Pharma heavily promoted *OxyContin* to doctors like general practitioners, who had often had little training in the treatment of serious pain or in recognizing signs of drug abuse in patients
 - Even scientists asserted narcotics were not addictive when used correctly (Porter & Jick, 1980).
- Led to widespread diversion and misuse of these medications before it became clear that these medications could indeed be highly addictive (Van Zee, 2009).
- In 2007, manufacturer of *OxyContin* pleaded guilty to federal criminal charges that they misled regulators, doctors and patients about the drug's risk of addiction and its potential to be abused and agreed to pay some \$600 million in fines.
 - <http://www.nytimes.com/2007/05/10/business/11drug-web.html>

How Did This Crisis Happen?

- What we know now:
 - Roughly 21 to 29 percent of patients prescribed opioids for chronic pain misuse them.
 - Between 8 and 12 percent develop an opioid use disorder.
 - An estimated 4 to 6 percent who misuse prescription opioids transition to heroin.
 - About 80 percent of people who use heroin first misused prescription opioids.
- National Institute on Drug Abuse at <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-crisis>

Economic Cost of Opioid Crisis

- **Medical Costs**

- Direct treatment of opioid overdoses
- Diseases related to opioid use, e.g., Hepatitis C
- Medicaid 636K enrollees with opioid addiction in 2013

- **Criminal Justice Costs**

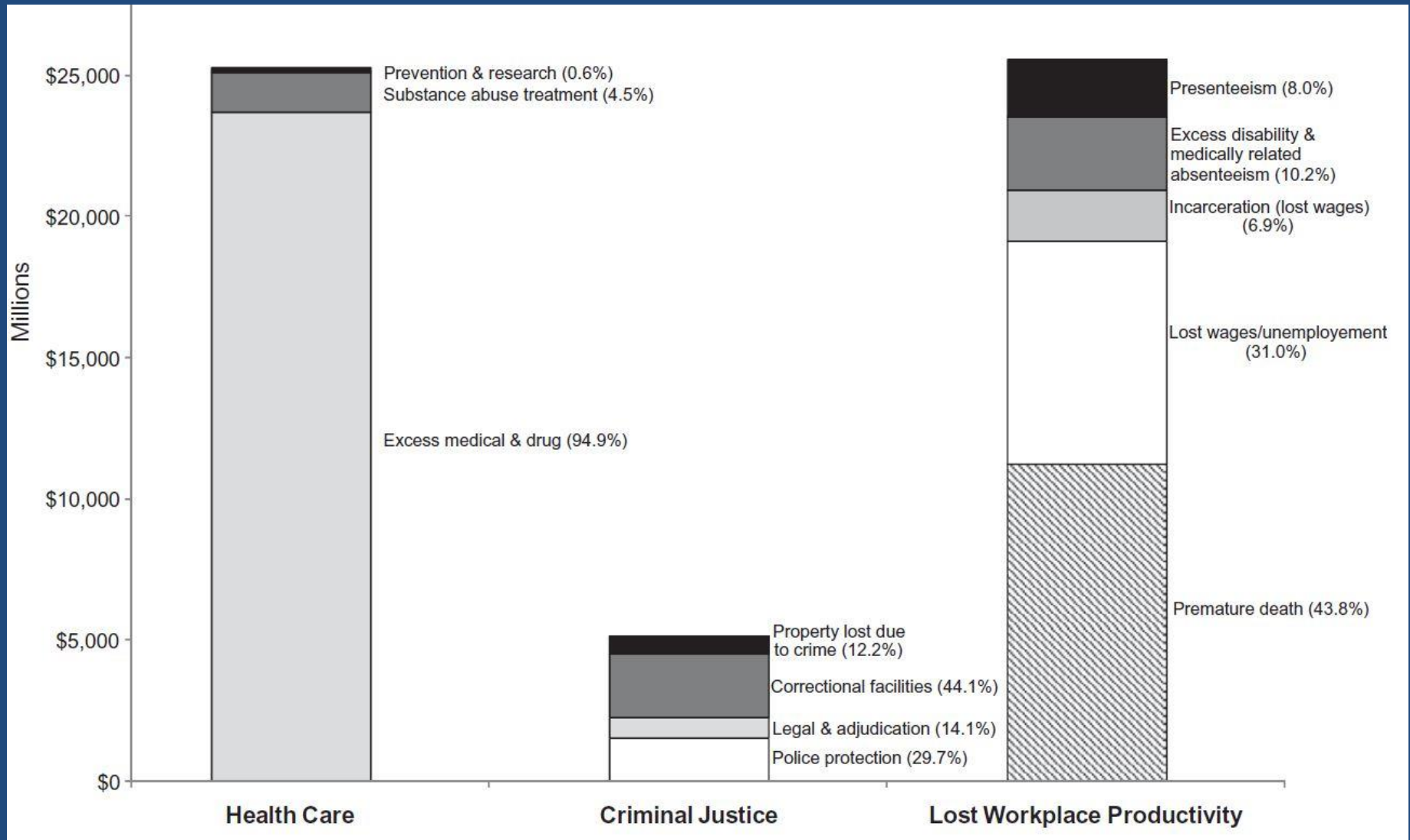
- Police/EMTs +2.8B
- Courts +1.2B
- Incarceration +3.2B

- **Production Costs**

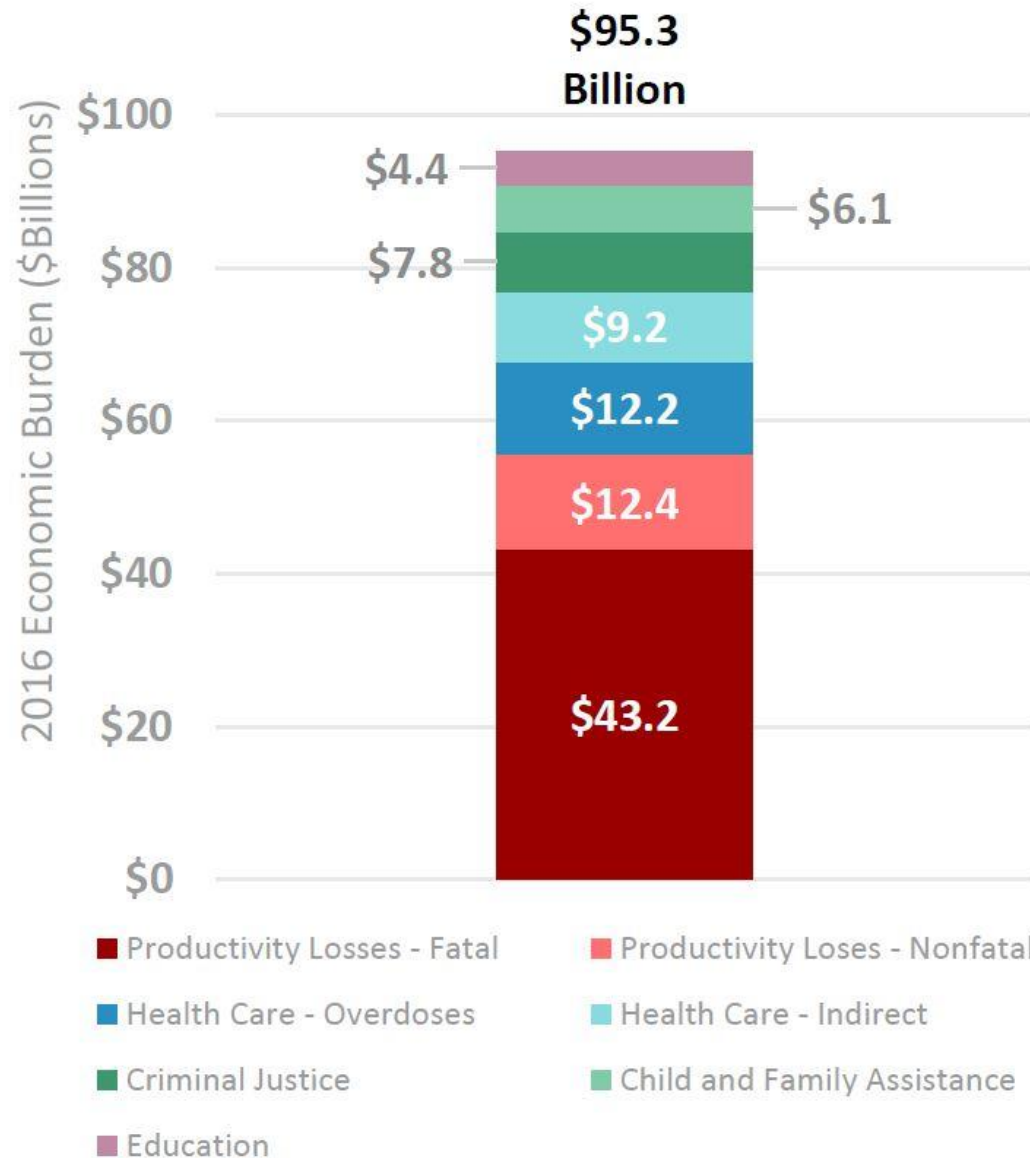
- ↑ Mortality
- ↓ Participation rate
- ↑ On-the-job injuries
- ↑ Non-compensation costs (drug screening)

Economic Costs of Opioid Crisis

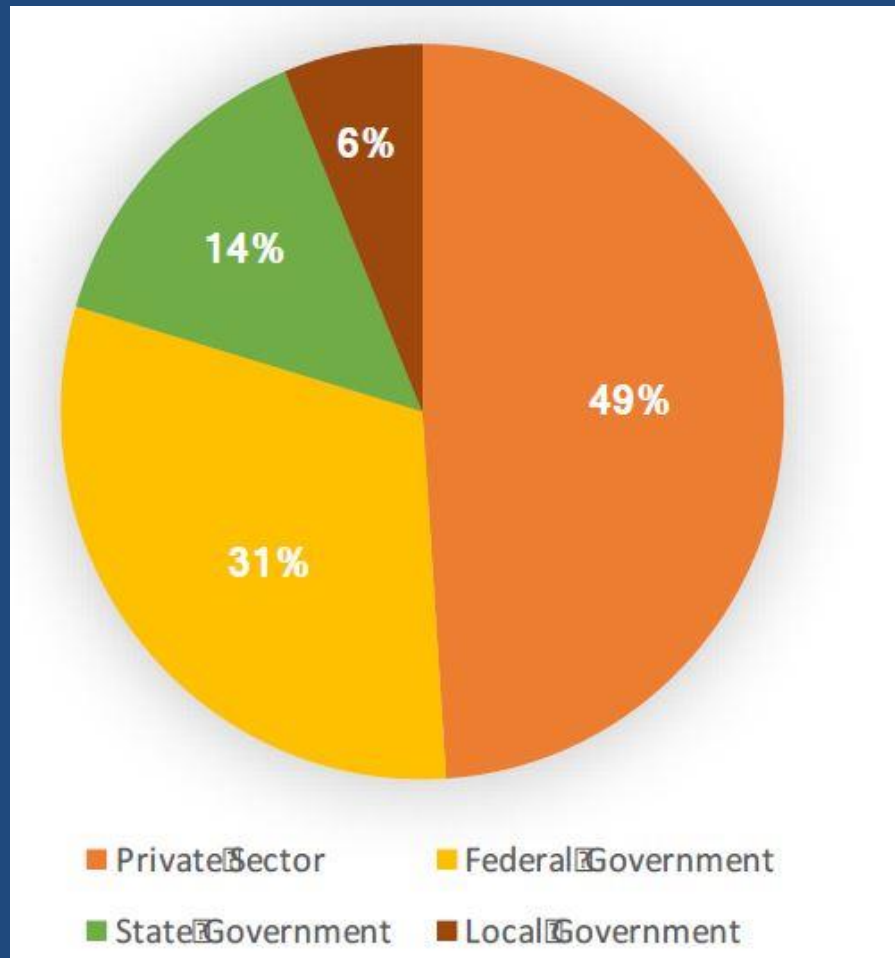
Birnbaum et al. (2011)



Economic Losses



Share of Economic Burden



Courtesy of *Altarum*, Value of Health Modeling Tool

www.Altarum.org

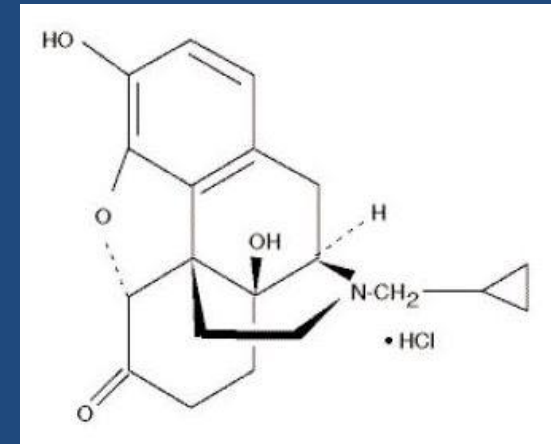
What Can Be Done?

A billboard on Route 23 south of Chillicothe, Ohio (*Washington Post*)



Naloxone—Acute Overdose

- A prescription drug that can reverse the effects of opioid overdose and can be life-saving if administered in time.
- The drug is sold under the brand name *Narcan* or *Evzio*.
 - *Evzio*, a prescription treatment that can be used by family members or caregivers to treat a person known or suspected to have had an opioid overdose.
 - *Evzio* rapidly delivers a single dose of the drug naloxone via a *hand-held auto-injector*.
- Widespread distribution of naloxone — an overdose antidote — will save lives in acute cases.



What Can Be Done? —Chronic Management

Methadone



*Full agonist:
generates effect*

Buprenorphine



*Partial agonist:
generates limited effect*

Naltrexone



*Antagonist:
blocks effect*

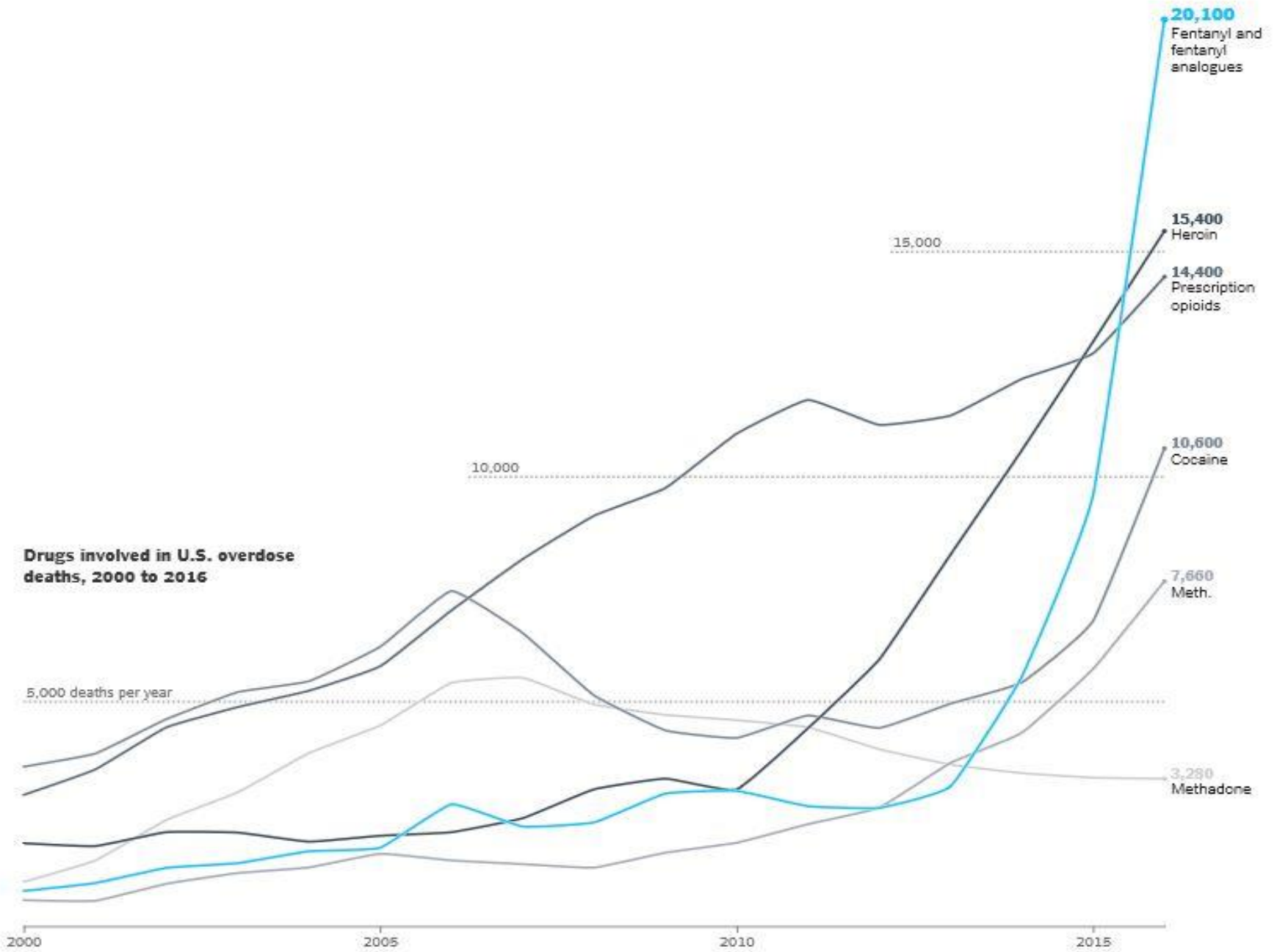
Supply and Demand Measures

- **Supply Side**
 - Interdiction
 - Prescription drug monitoring programs
 - Monitor physician prescribing behavior and patient using behavior
 - E-prescribing (e-Rx) for controlled substances
 - Promote non-narcotic ways of relieving chronic physical pain
 - Chang et al (2017). Tylenol + Advil = Opioid in terms of pain relief
- **Demand Side**
 - Safe injection sites where people take drugs under medical supervision
 - Drug checking stations to test drugs for fentanyl
 - Medication-assisted treatment (MAT) of opioid use disorder
 - Methadone
 - Buprenorphine
 - » Pew Charitable Trusts. Medication-Assisted Treatment Improves Outcomes for Patients With Opioid Use Disorder. November, 2016.

Fentanyl



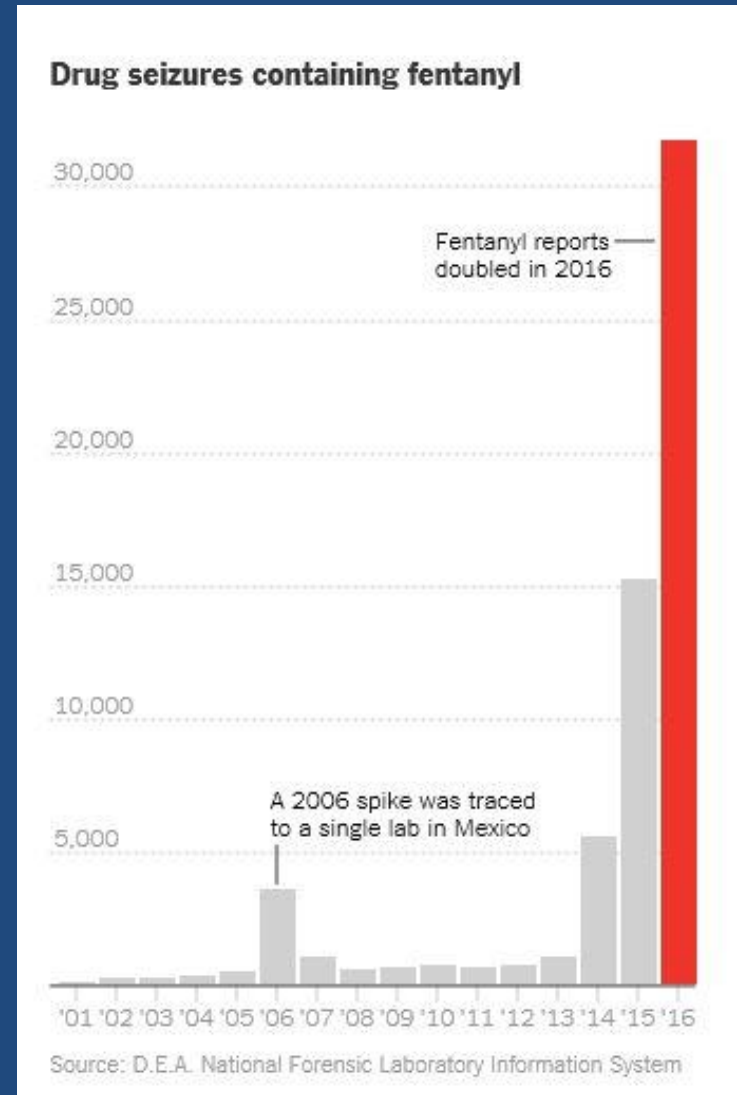
Drugs involved in U.S. overdose deaths, 2000 to 2016



Note: Data for 2016 is provisional.

Fentanyl

- Pharmaceutical fentanyl is a synthetic opioid pain medication, approved for treating severe pain, typically advanced cancer pain.
 - It is 50 to 100 times more potent than morphine!
- Illicitly-made fentanyl is sold through illegal drug markets for its heroin-like effect, and it is often mixed with heroin and/or cocaine as a combination product.



Fentanyl Is Not New

U.S. Drug Sleuths Finally Solve Mystery of the Deadly China White; New Narcotic Identified After Monthlong Quest Drug Sleuths Solve Mystery of China White Down the Wrong Pathways

By JOHN NOBLE WILFORD ();

December 30, 1980,

, Section Science Times, Page C1, Column , words

 PERMISSIONS

[DISPLAYING ABSTRACT]

McLEAN, Va. EARLY last month, police in Riverside County, Calif., near Los Angeles, came upon a drug overdose victim who carried a tiny packet containing a pinch of unfamiliar white powder. A preliminary analysis ruled out any of the common drugs in the legal or illegal marketplace.

Why Do People Take Fentanyl?

- **Dealers' perspective:**
 - Fentanyl is easier to get and more profitable to sell.
 - Some law enforcement officials argue that drug users will seek out batches of drugs that contain fentanyl or that are known to have killed people, as that demonstrates the drugs' potency.
- **Users' perspective:**
 - While that is certainly true for some number of drug users, research suggests that they are a minority. Most are exposed to fentanyl inadvertently — it's difficult to know just what is in the drugs they are buying (many dealers don't know themselves), one more risk in a dangerous pursuit of a high.
- **Addiction specialist perspective:**
 - For long-time drug users, their continued use underlines the grip of addiction and the agony of withdrawal: They know it could kill them but do it anyway.
 - Casual drug users are also at risk of fentanyl poisoning, particularly with increased reports of fentanyl-adulterated cocaine.

Fentanyl & Potency

- Responders are finding that, with fentanyl and carfentanil, the overdoses can be so severe that multiple doses of naloxone are needed to pull people out.
 - In Warren County in Ohio, Doyle Burke, the chief investigator at the county coroner's office, has been watching the number of drug deaths rise and said. "E.M.S. crews are hitting them with 12, 13, 14 hits of Narcan with no effect," said Mr. Burke, likening a shot of Narcan to "a squirt gun in a house fire." (Katz, *New York Times*, June 5, 2017)
- Naloxone remains effective, but:
 - May be administered too late to restore breathing; or
 - Drug taken by the person was not an opioid

Fentanyl Sourcing

- **Mexican Cartels**
 - Adding fentanyl to heroin smuggled into the United States (2006).
- **China**
 - Now China connection is allowing local drug dealers in North America to mass produce fentanyl in pill form, producing tablets that look identical to *OxyContin*.
 - Packaged pills
 - Commercial pill presses ordered from Internet



U.S. Government

Presidential Commission

Commission on Combating Drug Addiction and the Opioid Crisis

- Executive Order—March 29, 2017
 - Presidential Executive Order Establishing the President’s Commission on Combating Drug Addiction and the Opioid Crisis
 - Public meeting held on June 16, 2017
- Interim Report Recommendations (n=9)
 - #1 “Declare a national emergency under Public Health Service Act or the Stafford Act.”
- 1 November 2017
 - Final Commission Report
- October 26, 2017
 - President declares opioid crisis a public health crisis
 - MEMO SUBJECT: Combatting the National Drug Demand and Opioid Crisis
 - <https://www.gpo.gov/fdsys/pkg/FR-2017-10-31/pdf/2017-23787.pdf>

Initial Commission Recommendations

- Enhance *prescription drug monitoring* programs and *mandatory physician education* on the dangers of opioids,
- Expanding access to and funding development of *medication-assisted treatment*, eliminating Medicaid barriers to in-patient addiction treatment
- Enforcing laws that prevent health insurance companies from limiting mental health coverage.
- Called upon the president to mandate that naloxone be carried by every American law enforcement officer.

Final Recommendations

- Recommendation 30
 - The Commission recommends the White House develop a national outreach plan for the Fentanyl Safety Recommendations for First Responders. Federal departments and agencies should partner with Governors and state fusion centers to develop and standardize data collection, analytics, and information-sharing related to first responder opioid-intoxication incidents.

Responder Guidance

- Interagency group under the National Security Council
- Included in Presidential Commission Report

FENTANYL†

SAFETY RECOMMENDATIONS FOR FIRST RESPONDERS

† For the purposes of this document, fentanyl, related substances, and synthetic opioids (herein after referred to as fentanyl†) includes fentanyl analogues (e.g., acetylfentanyl, acrylfentanyl, carfentanil, furanylfentanyl), novel synthetic opioids (e.g., U-47700), and other drugs that may be laced with these substances.

- ▶ **The abuse of drugs containing fentanyl† is killing Americans. Misinformation and inconsistent recommendations regarding fentanyl† have resulted in confusion in the first responder community.**
- ▶ You as a first responder (law enforcement, fire, rescue, and emergency medical services (EMS) personnel) are increasingly likely to encounter fentanyl† in your daily activities (e.g., responding to overdose calls, conducting traffic stops, arrests, and searches).
- ▶ This document provides scientific, evidence-based recommendations to protect yourself from exposure.

WHAT YOU NEED TO KNOW

- ▶ Fentanyl† can be present in a variety of forms (e.g., powder, tablets, capsules, solutions, and rocks).
- ▶ Inhalation of airborne powder is **MOST LIKELY** to lead to harmful effects, but is less likely to occur than skin contact.
- ▶ Incidental skin contact may occur during daily activities but is not expected to lead to harmful effects if the contaminated skin is promptly washed off with water.
- ▶ Personal Protective Equipment (PPE) is effective in protecting you from exposure.
- ▶ Slow breathing or no breathing, drowsiness or unresponsiveness, and constricted or pinpoint pupils are the specific signs consistent with fentanyl† intoxication.
- ▶ Naloxone is an effective medication that rapidly reverses the effects of fentanyl†.

Actions to take . . .

To protect yourself from exposure

- ▶ Wear **gloves** when the presence of fentanyl† is suspected.
- ▶ **AVOID actions that may cause powder to become airborne.**
- ▶ Use a properly-fitted, NIOSH-approved **respirator ("mask")**, wear **eye protection**, and minimize skin contact when responding to a situation where small amounts of suspected fentanyl† are visible and may become airborne.
- ▶ Follow your department guidelines if the scene involves large amounts of suspected fentanyl† (e.g., distribution/storage facility, pill milling operation, clandestine lab, gross contamination, spill or release).

When exposure occurs

- ▶ Prevent further contamination and notify other first responders and dispatch.
- ▶ Do not touch your eyes, mouth, nose or any skin after touching any potentially contaminated surface.
- ▶ Wash skin thoroughly with cool water, and soap if available. **Do NOT use hand sanitizers as they may enhance absorption.**
- ▶ Wash your hands thoroughly after the incident and before eating, drinking, smoking, or using the restroom.
- ▶ If you suspect your clothing, shoes, and PPE may be contaminated, follow your department guidelines for decontamination.

If you or other first responders exhibit

- **Slow Breathing or No Breathing**
- **Drowsiness or Unresponsiveness**
- **Constricted or Pinpoint Pupils**
- ▶ Move away from the source of exposure and call EMS.
- ▶ Administer naloxone according to your department protocols. Multiple doses may be required.
- ▶ If naloxone is not available, rescue breathing can be a lifesaving measure until EMS arrives. Use standard basic life support safety precautions (e.g., pocket mask, gloves) to address the exposure risk.
- ▶ If needed, initiate CPR until EMS arrives.



Collaborative Support From:

- American College of Emergency Physicians
- American College of Medical Toxicologists
- American Industrial Hygiene Association
- Association of State and Territorial Health Officials
- Association of State Criminal Investigative Agencies
- Fraternal Order of Police

- International Association of Chiefs of Police
- International Association of Fire Chiefs
- International Association of Fire Fighters
- Major Cities Chiefs Association
- Major County Sheriffs of America
- National Alliance of State Drug Enforcement Agencies

- National Association of Counties
- National Association of County and City Health Officials
- National Association of Emergency Medical Technicians
- National Association of EMS Physicians
- National Association of State EMS Officials

- National Governor's Association
- National HOTA Directors Association
- National Maricopa Officers' Association/Coalition
- National Sheriff's Association
- National Volunteer Fire Council
- Police Executive Research Forum
- Police Foundation

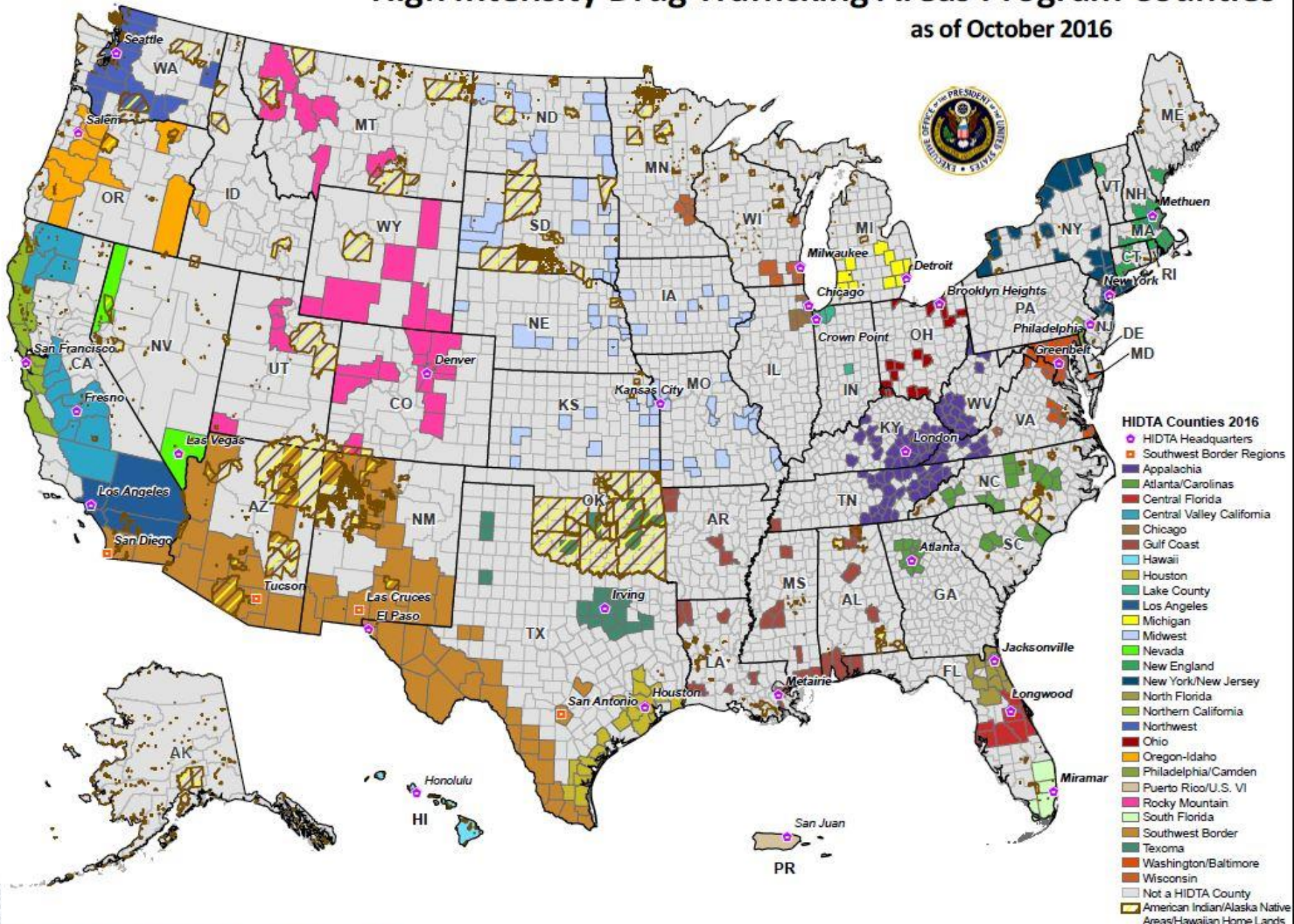
HIDTA Program

Office of National Drug Control Policy

- *High Intensity Drug Trafficking Areas (HIDTA) Program*
 - Created by Congress with the Anti-Drug Abuse Act of 1988, provides assistance to Federal, state, local, and tribal law enforcement agencies operating in areas determined to be critical drug-trafficking regions of the United States.
- <https://www.whitehouse.gov/ondcp/high-intensity-drug-trafficking-areas-program>

High Intensity Drug Trafficking Areas Program Counties

as of October 2016



HIDTA Activities

- The HIDTA program currently funds 752 initiatives throughout the nation, including:
 - Enforcement initiatives comprising multi-agency investigative, interdiction, and prosecution activities;
 - Intelligence and information-sharing initiatives;
 - Support for programs that provide assistance beyond the core enforcement and intelligence and information-sharing initiatives; and
 - Drug use prevention and drug treatment initiatives.

Non-U.S. Government Uses

Moscow Theater Hostage Crisis



- On October 26, 2002, Russian Special Forces deployed a chemical aerosol against Chechen terrorists to rescue hostages in the *Dubrovka* theatre.
- Its use confirmed Russian military interest in chemicals with effects on personnel and caused 125 deaths through a combination of the aerosol and inadequate medical care.
- A study provided evidence from liquid chromatography–tandem mass spectrometry analysis of extracts of clothing from two British survivors, and urine from a third survivor, that the aerosol comprised a mixture of two anaesthetics—*carfentanil* and *remifentanil*—whose relative proportions this study was unable to identify.
 - Riches JR. et al. *Journal of Analytical Toxicology*. 2012;36:647-656.

CDC

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

- Recommendations for primary care clinicians who are prescribing opioids for chronic pain outside of active cancer treatment, palliative care, and end-of-life care.
 - Intended to improve communication between clinicians and patients about the risks and benefits of opioid therapy for chronic pain, improve the safety and effectiveness of pain treatment, and reduce the risks associated with long-term opioid therapy, including opioid use disorder, overdose, and death
- Prescribing Guideline addresses:
 - When to initiate or continue opioids for chronic pain;
 - Opioid selection, dosage, duration, follow-up, and discontinuation; and
 - Assessing risk and addressing harms of opioid use.

Private Sector

CVS tightens restrictions on opioid prescriptions in bid to stanch epidemic

By ANDREW JOSEPH [@DrewQJoseph](#) / SEPTEMBER 21, 2017



CVS

- **CVS Caremark**, which has 90 million plan members, will introduce three new policies, effective in February 2018 (based on CDC Prescribing Guidance)
 - Patients new to opioids will only get seven days' worth of medication
 - Daily dosages will be limited
 - Immediate-release formulations of drugs to be given before extended-release versions can be prescribed
 - Doctors can ask for exemptions for certain patients, CVS said, and employers and insurers can opt out of the program

Express Scripts

- The nation's largest pharmacy benefit manager will soon limit the number and strength of opioid drugs prescribed to *first-time users* as part of a wide-ranging effort to curb an epidemic affecting millions of Americans.

Express Scripts to limit opioids, concerning doctors

By ASSOCIATED PRESS / AUGUST 16, 2017



JEFF ROBERSON/AP

Florida's Largest Insurer To Stop Covering OxyContin Amid Opioid Crisis

- **Florida Blue**, the state's largest health insurer, will no longer cover OxyContin as the nation faces an opioid epidemic that has been declared a public health emergency.
- The insurer will stop covering the drug beginning Jan. 1 in an effort to stem the abuse of the popular painkiller.
- Instead of OxyContin, a brand name for oxycodone, Florida Blue will cover *Xtampza ER*, an extended-release version.



NIOSH

Protecting Workers at Risk



Fentanyl & Potency Concerns

- *Gray Death: It's 10,000 times more powerful than morphine*
 - USA Today Vic Ryckaert and Shari Rudavsky, The Indianapolis Star Published 8:46 p.m. ET May 24, 2017.
- *Gray Death – The Deadliest Drug Cocktail in Town*
 - By Pamela Kulbarsh, Jun 6, 2017 from Officer.com
- *Fentanyl Crisis: Ohio Cop Accidentally Overdoses During Drug Call*
 - Published May 15, 2017, NBC Nightly News with Lester Holt
- *Florida boy, 10, dies of fentanyl overdose after visiting swimming pool*
 - Published July 18, 2017, Tribune Media Wire

Exposure of Responders to Fentanyl— What We Know

- Many media reports of responder exposure to opioids
 - Whether it's a routine traffic stop or a search of an illicit drug lab, officers are more often finding themselves at risk of exposure to dangerous drugs. Narcotics officers have even had suspects fling powder at them in an attempt to escape.
- Concerns in the responder community
 - NIOSH receives calls/emails every week from responders
 - Law enforcement
 - Emergency medical staff (ER personnel/EMTs/Paramedics)
 - State public health departments
 - Medical examiners
- Responders want guidance to protect themselves

Exposure of Responders to Fentanyl— What We Don't Know

- In what job tasks does exposure occur?
- What exposure routes are most likely to result in an adverse health outcome?
- How frequent is exposure?
- Can standard safe operating procedures be tailored to exposure prevention?

NIOSH Guidance Webpage

<https://www.cdc.gov/niosh/topics/fentanyl/risk.html>

The National Institute for Occupational Safety and Health (NIOSH)

Workplace Safety & Health
Topics

Fentanyl

Protecting Workers at Risk

Illegal Use of Fentanyl

Resources

Promoting productive workplaces
through safety and health research



[NIOSH](#) > [Workplace Safety & Health Topics](#)

Fentanyl: Preventing Occupational Exposure to Emergency Responders



Overview

Fentanyl is a powerful synthetic drug that is similar to morphine and heroin but is 50 to 100 times more potent. Fentanyl and its analogs are members of the class of drugs known as rapid-acting synthetic opioids that alleviate pain. Other drugs in this class include fentanyl analogs, such as acetylfentanyl, butyrfentanyl, carfentanil, alfentanil, sufentanil and remifentanil. Fentanyl acts quickly to depress central nervous system and respiratory function. Exposure to fentanyl may be fatal.

The U.S. Drug Enforcement Administration (DEA) classifies fentanyl and some of its analogs as schedule II prescription drugs, which are typically used to treat patients with severe pain or to manage pain after surgery. They are sometimes used to treat patients with chronic pain who are physically tolerant to other opioids; however per the [CDC Guideline for Prescribing Opioids for Chronic Pain](#), only clinicians who are familiar with the dosing and absorption

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Recommendations

- Safe Operating Procedures
- Training
- Decontamination
- Personal Protective Equipment
- Medical countermeasures
 - Naloxone is effective for reversing opioid overdose but optimal strategies for out-of-hospital use are uncertain.
 - Higher concentration intranasal naloxone seems to have efficacy similar to that of intramuscular naloxone for reversal of opioid overdose with no difference in adverse events.
 - Chou et al. 2017
 - Should *Narcan* be kept in the workplace next to the AED?

Standard Safe Operating Procedures

- Do not eat, drink, smoke, or use the bathroom while working in an area with known or suspected fentanyl.
- Do not touch the eyes, mouth, and nose after touching any surface potentially contaminated with fentanyl.
- Field testing of fentanyl or its analogues is not recommended due to an increased risk of exposure to responders performing field testing.
 - If detection and identification of fentanyl is critical to the incident response, develop an incident specific plan to perform the field testing in accordance with agency policies and procedures. Personnel specifically trained to perform the field testing should perform the field testing in the appropriate personal protective equipment (PPE). Never handle fentanyl or its analogues without the appropriate PPE.
- Avoid performing tasks or operations that may aerosolize fentanyl due to increased exposure risks. Activities that aerosolize fentanyl require higher levels of PPE and should be conducted by appropriately trained personnel and in accordance with agency policies and procedures.
- Wash hands with soap and water immediately after a potential exposure and after leaving a scene where fentanyl is known or suspected to be present to avoid potential exposure and to avoid cross contamination. Do not use hand sanitizers or bleach solutions to clean contaminated skin.

Detection Technology

TruNarc and TacticID

<https://cen.acs.org/articles/95/i45/Powerful-detection-technology-powerful-new.html>

- Raman spectrometers, initially designed to identify explosives for hazmat teams and bomb squads, are being updated to identify illicit drugs. The devices collect spectra produced when laser light scatters from molecules in the sample, and they match the spectra to those in a built-in library for various drugs, analogs, drug precursors, and cutting agents.



Training

- How to recognize the form and determine the quantity of the suspected fentanyl and other drugs.
- When to use PPE; what PPE is necessary; how to properly put on, use, take off, properly dispose of, and maintain PPE; and the limitations of PPE.
- What the potential exposure routes are for fentanyl and its analogues.
- How to recognize the signs and symptoms of opioid exposure.
- When and how to seek medical help.

Decontamination

- **Soap & Water**
 - Immediately use soap and water to thoroughly wash and rinse contaminated skin.
 - Take care not to break the skin during the decontamination process and to cover all open wounds.
 - Do not use hand sanitizers or bleach solutions to clean contaminated skin.
- **Contaminated Clothing**
 - All contaminated clothing should be removed and laundered, being careful not to disturb any areas of contamination. Shower immediately after a potential exposure.
- **Contaminated Equipment**
 - Decontamination of reusable PPE and equipment should be done according to the manufacturer's recommendations. Contaminated single use PPE should be placed in labeled durable 6 mil polyethylene bags and disposed of appropriately.

Personal Protective Equipment

- NIOSH has identified job categories as positions where responders might come into contact with fentanyl or its analogues:
 - Pre-hospital patient care
 - Law enforcement
 - Investigation and evidence handling
 - Special operations and decontamination

Personal Protective Equipment

- Exposure levels are defined as follows:
 - **Minimal:** Response to a situation where it is suspected that fentanyl may be present but no fentanyl products are visible
 - Example: An EMS response to a suspected fentanyl overdose or law enforcement operation where intelligence indicates fentanyl products are suspected but are not visible on scene
 - **Moderate:** Response to a situation where small amounts of fentanyl products are visible
 - Example: An EMS response to a suspected fentanyl overdose or law enforcement operation where fentanyl products are suspected and small amounts are visible on scene
 - **High:** Response to a situation where liquid fentanyl or large amounts of fentanyl products are visible
 - Example: A fentanyl storage or distribution facility, fentanyl milling operation, or fentanyl production laboratory

PPE Recommendations

- NIOSH PPE Table provides PPE recommendations for protection against fentanyl and its analogues.
 - <https://www.cdc.gov/niosh/topics/fentanyl/risk.html>
- Identifying the PPE appropriate for the risk is done by first selecting the correct job category and then the level of exposure anticipated.

Personal Protective Equipment	Pre-Hospital Patient Care			Law Enforcement Routine Duties			Investigations and Evidence Collection			Special Operations and Decontamination			
	Exposure Level	Minimal	Moderate	High	Minimal	Moderate	High	Minimal	Moderate	High	Minimal	Moderate	High
<i>Respiratory Protection</i>													
Disposable N100, R100, or P100 FFR ¹		✓				✓			✓			✓	
Elastomeric APR ²								●	✓			●	✓
PAPR ³									●			●	●
SCBA ⁴									■				■
<i>Face and Eye Protection</i>													
Safety goggles/glasses ⁵		✓				✓		✓	✓		✓	✓	✓
<i>Hand Protection</i>													
Nitrile gloves ⁶	✓	✓			✓	✓		✓	✓		✓	✓	✓
Nitrile gloves, double or use of thicker gloves			●			●		●	●		●	●	✓
<i>Dermal Protection</i>													
Wrist/arm protection ⁷		✓				✓		✓			✓	✓	✓
Particulate hazards protective ensemble (i.e., NFPA 1999 Single or Multi-Use or NFPA 1994 Class 4 Ensemble)									✓				✓
Chemical hazards protective ensemble (i.e., NFPA 1994 Class 3 Ensemble or Higher)									●				●

Key	
✓	Minimum protection recommended.
●	When an on-scene health risk assessment is conducted and higher protection is warranted.
■	If particulate + gas/vapor hazard is expected above the immediately dangerous to life or health (IDLH) values or concentration is unknown, SCBA is recommended.
▨	Not recommended, refer scene to special operations response workers (such as local hazmat team)

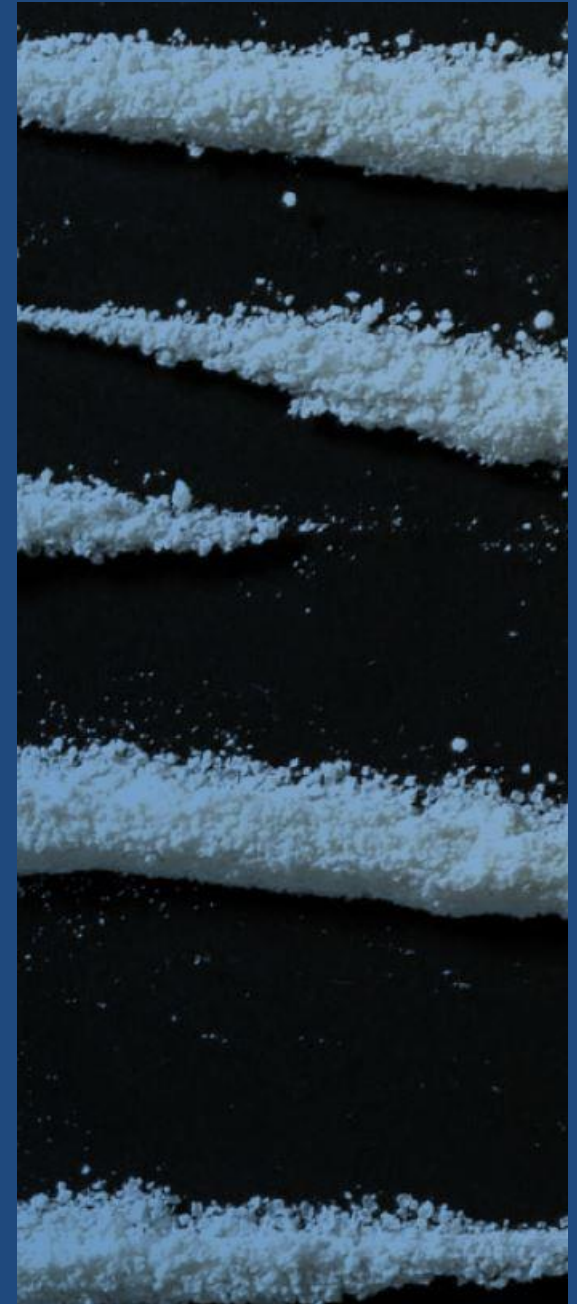
Working Dogs

- Working dogs, especially police K-9s performing detection activities, are also at risk of exposure to fentanyl and its analogues.
- Working dogs should be removed from an area where suspect synthetic opioids are encountered.
- If exposed, residual drug powder might remain on the dog's body; therefore, the proper precautions and procedures mentioned above should be employed by those handling the dog.



Conclusions

- **Prescription** and **illicit** drug overdose remains a growing public health crisis in the United States.
- Prescription opioid pain relievers were formerly driving the crisis, but by 2015 they shared equal measure with heroin, synthetic opioids other than methadone (mostly illicit fentanyl), and— increasingly—cocaine and methamphetamines
- The leveling off and declines in opioid prescribing rates since 2012, and high-dose prescribing rates since 2009, suggest that healthcare providers have responded, becoming more cautious in their opioid prescribing practices
- Additional measures are now urgently needed to address a diverse and evolving array of illicit drug types.
- The workplace is involved.



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