Opioid Overdose Prevention

Responding to a crisis

Presented by

Praxis

Massachusetts Department of Public Health
Bureau of Substance Abuse Services

Center for
Social Innovation
Translating Research, Transforming Human Services

Today's workshop is sponsored by BSAS

The Bureau of Substance Addiction Services:

- Provides access to addictions services for the uninsured
- Funds and monitors prevention, intervention, treatment and recovery support services
- Licenses addictions treatment programs and counselors
- Tracks statewide substance use trends
- Develops and implements policies and programs
- Supports the addictions workforce

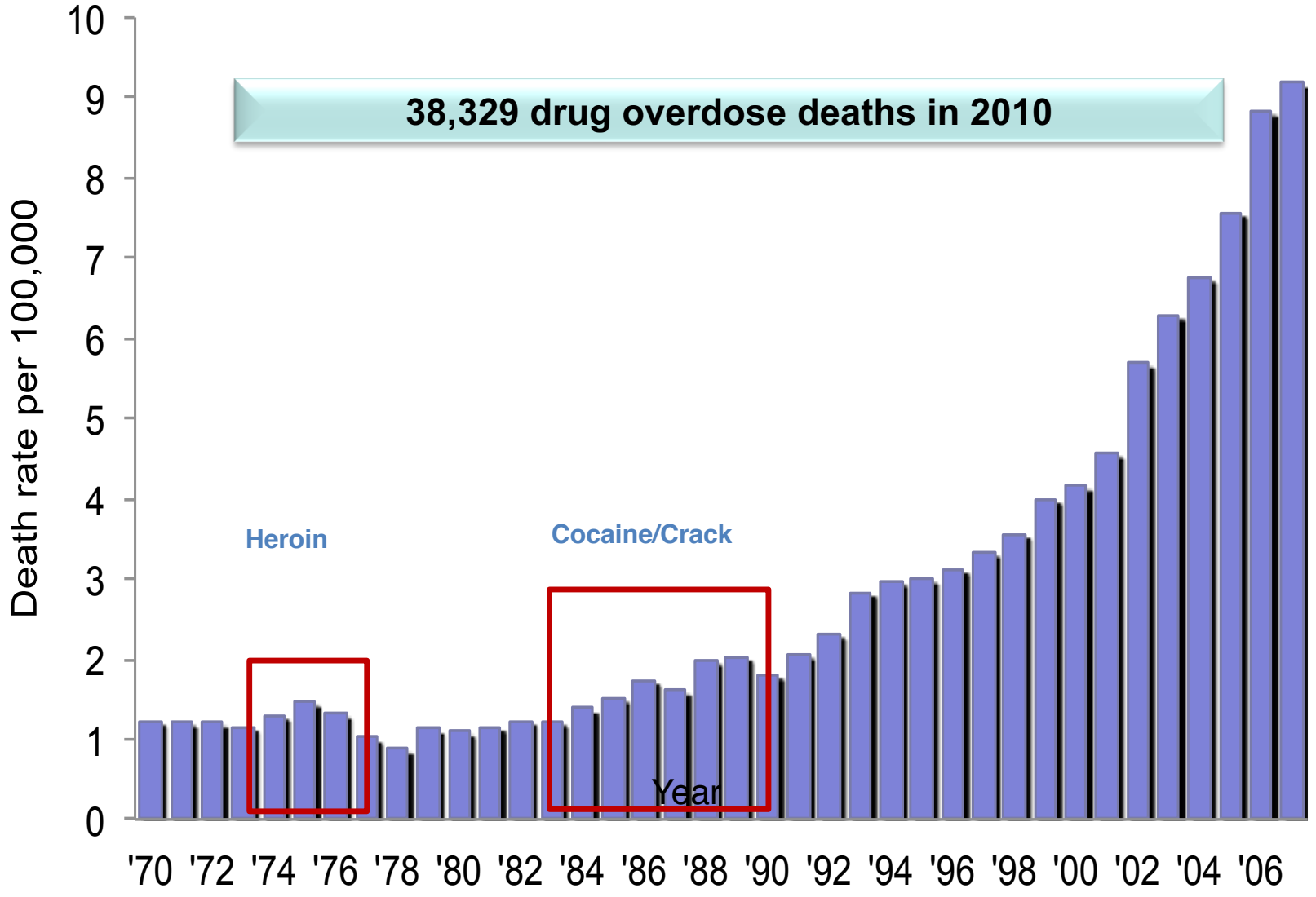
Helpful Websites:

BSAS: www.mass.gov/dph/bsas
Helpline: www.helpline-online.com
Careers of Substance: www.careersofsubstance.org

Agenda

- New Developments
- Opioid Overdose: Physiology and Risk Factors
- Opioid Overdose: Signs and Symptoms
- Responding to an Overdose
- Overdose Intervention and Harm Reduction Strategies

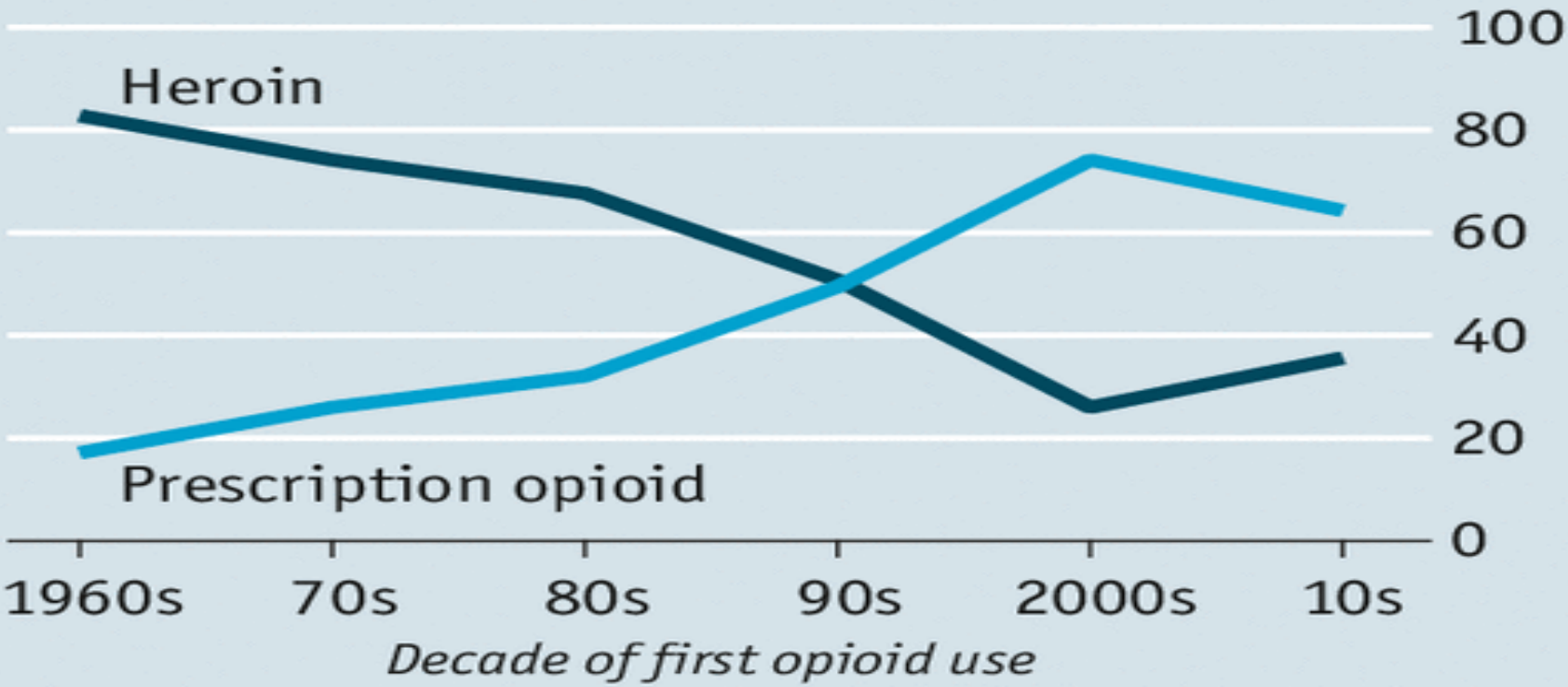
Unintentional Drug Overdose Deaths
United States, 1970–2007



New means, same end

Heroin-dependent sample that used heroin or a prescription opioid as their first opioid of abuse

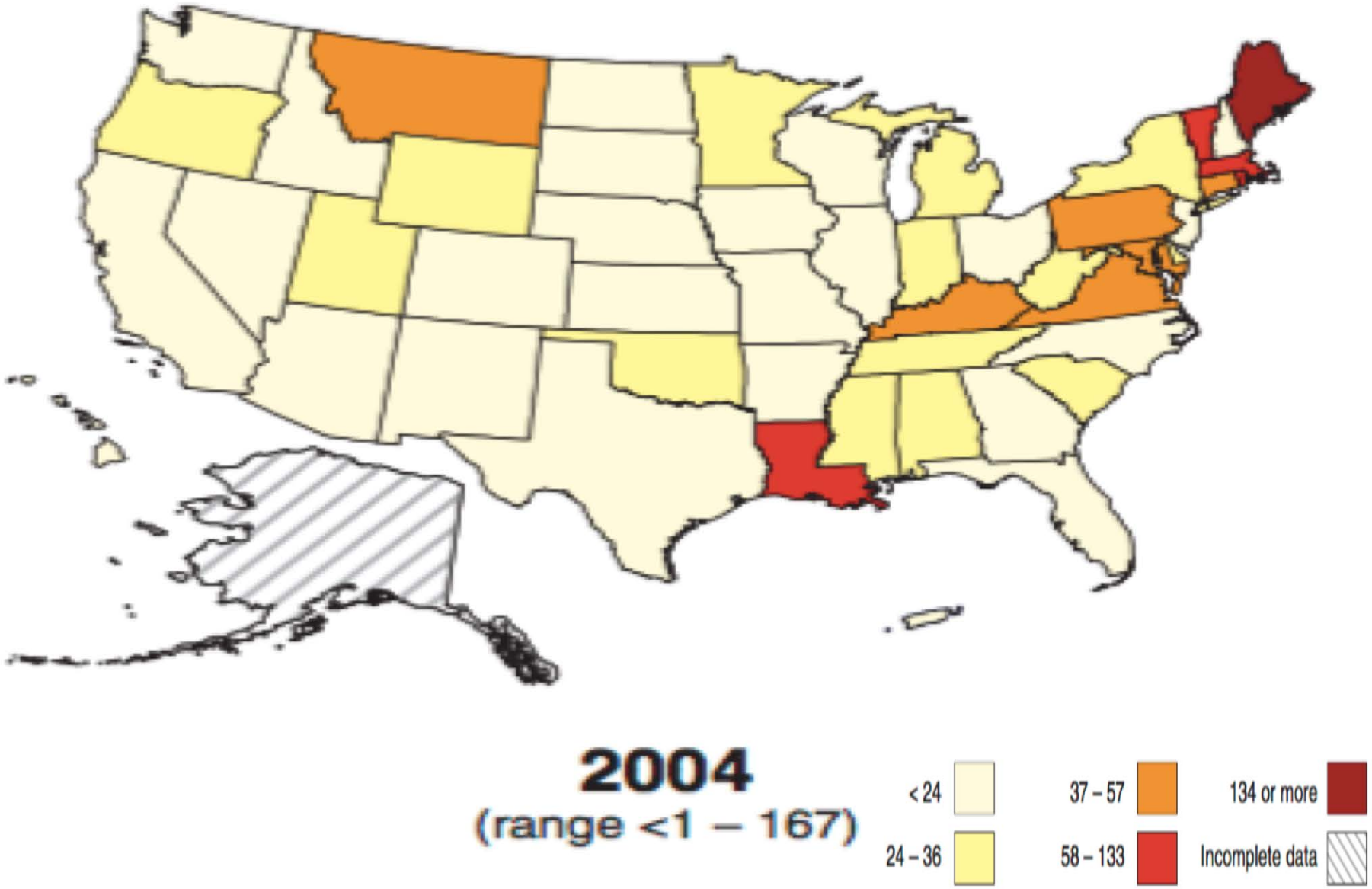
% of total



Source: *JAMA Psychiatry*

Primary non-heroin opioids/synthetics admission rates, by State

(per 100,000 population aged 12 and over)



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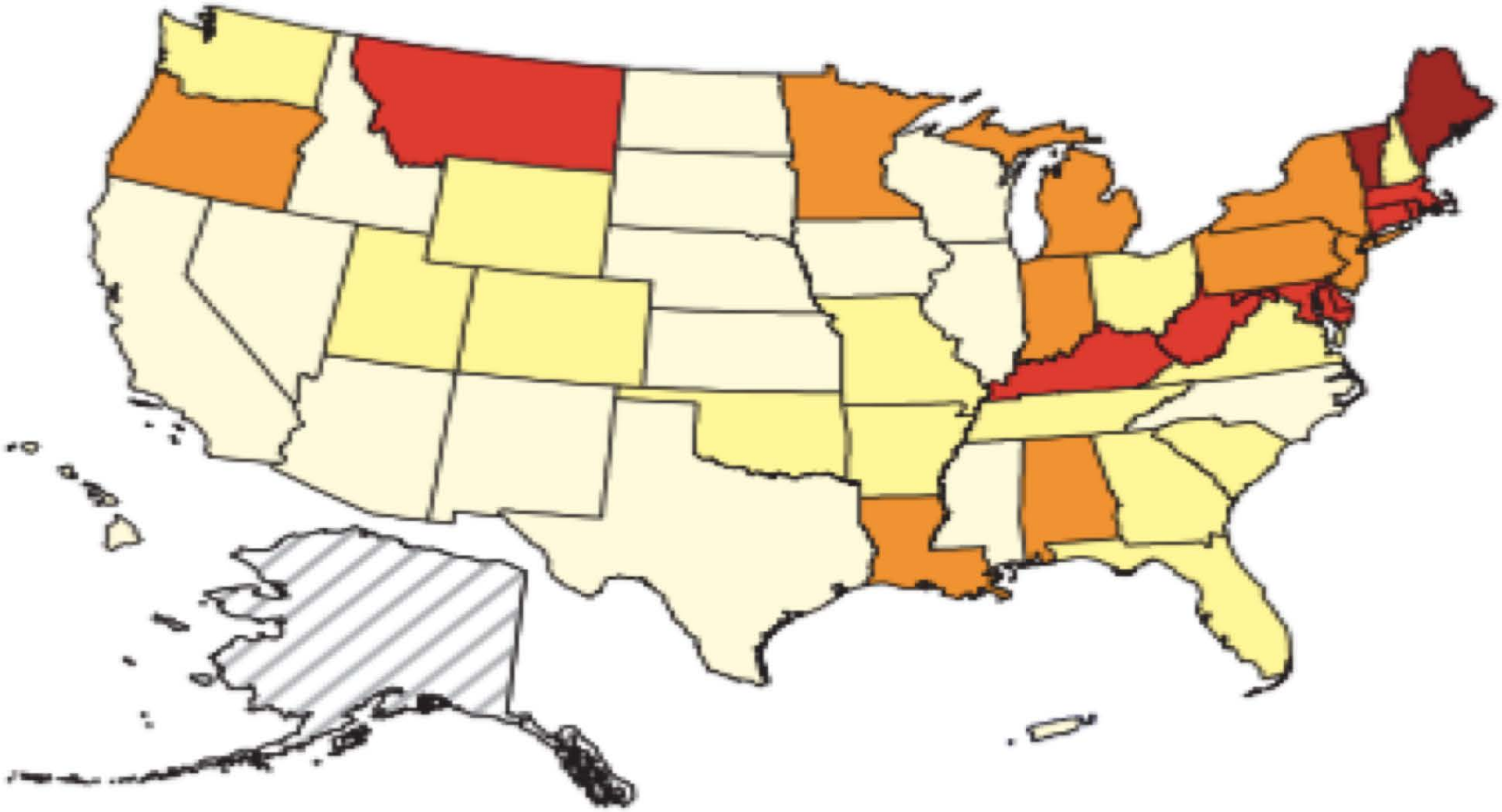

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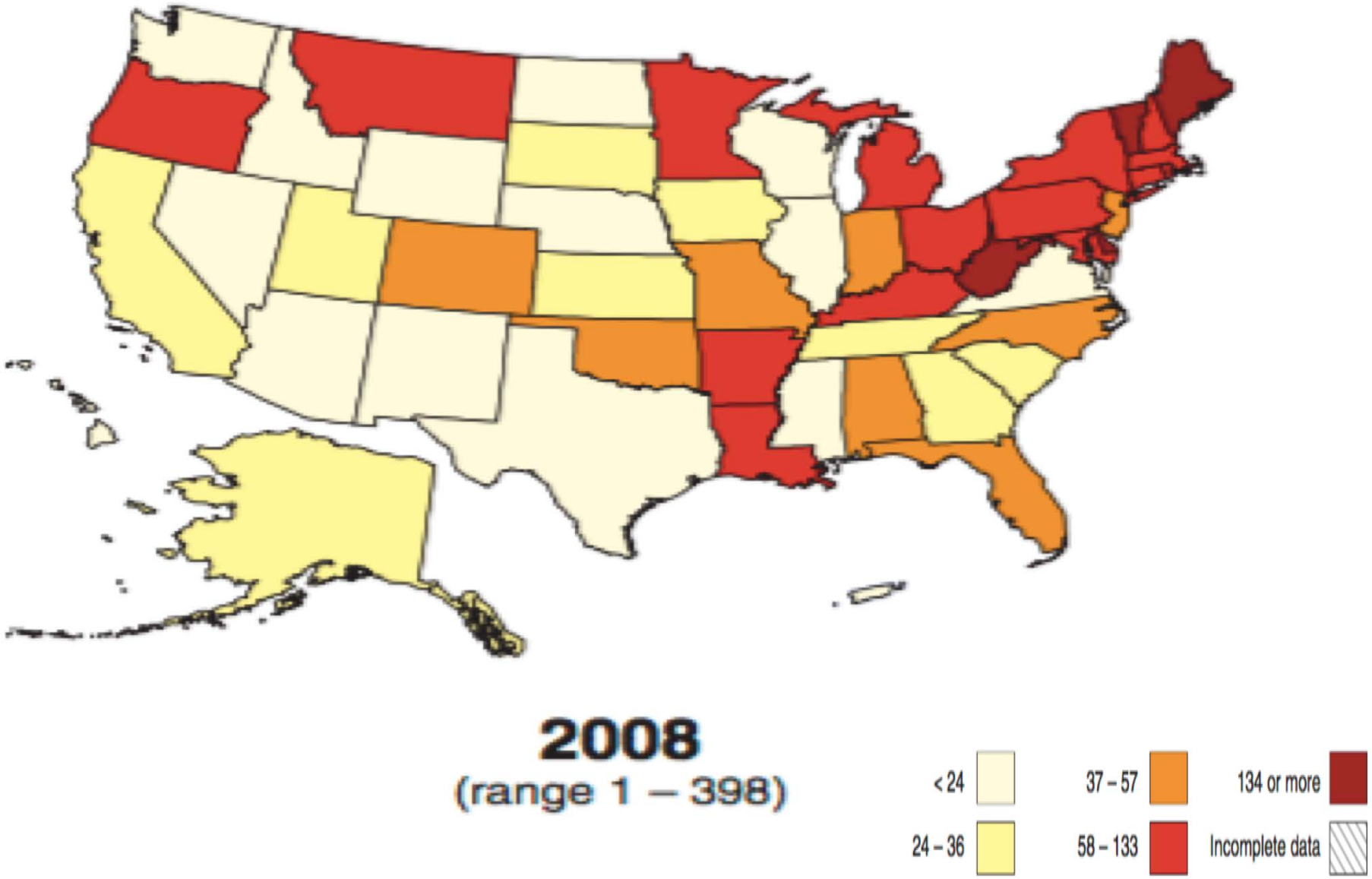

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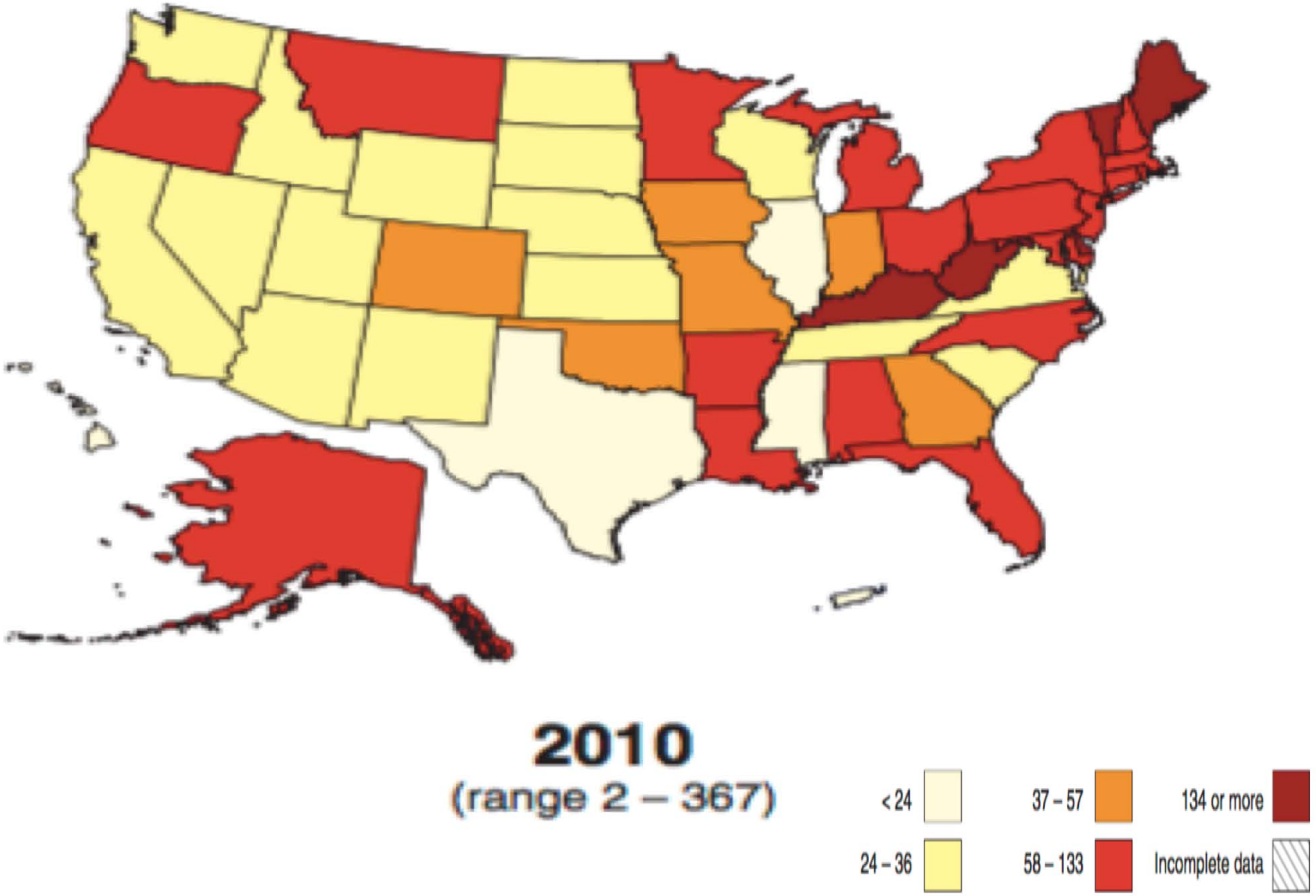

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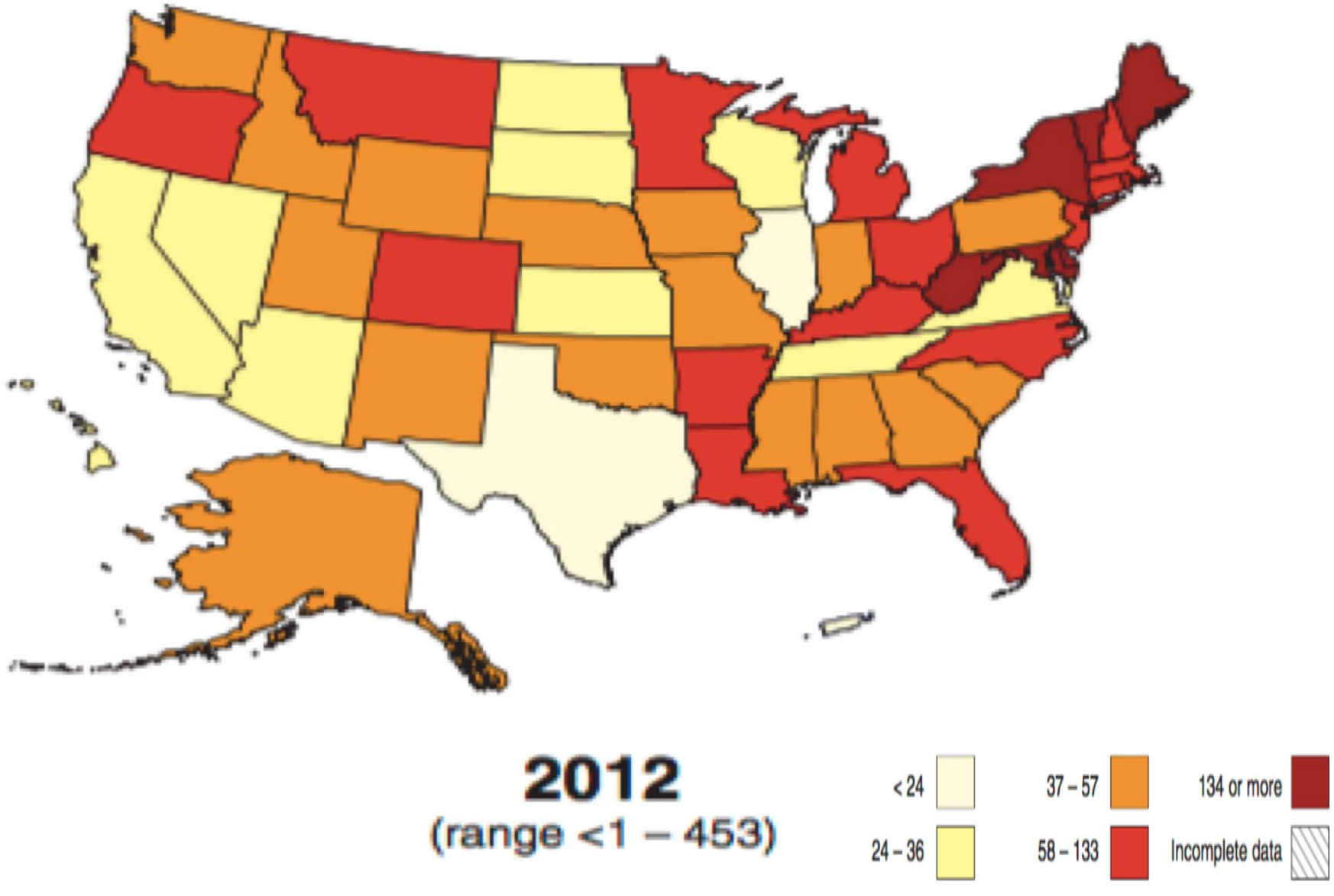

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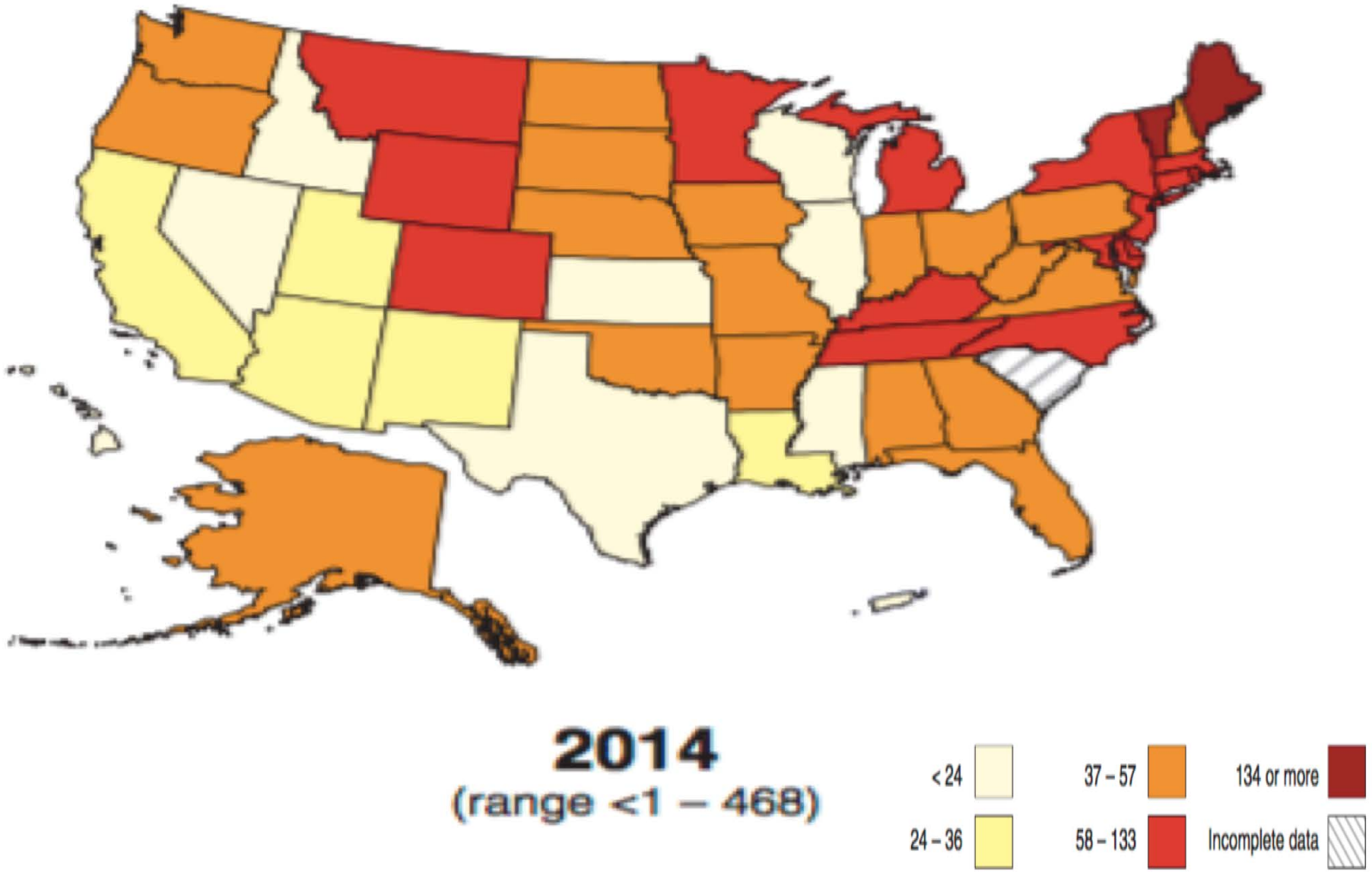
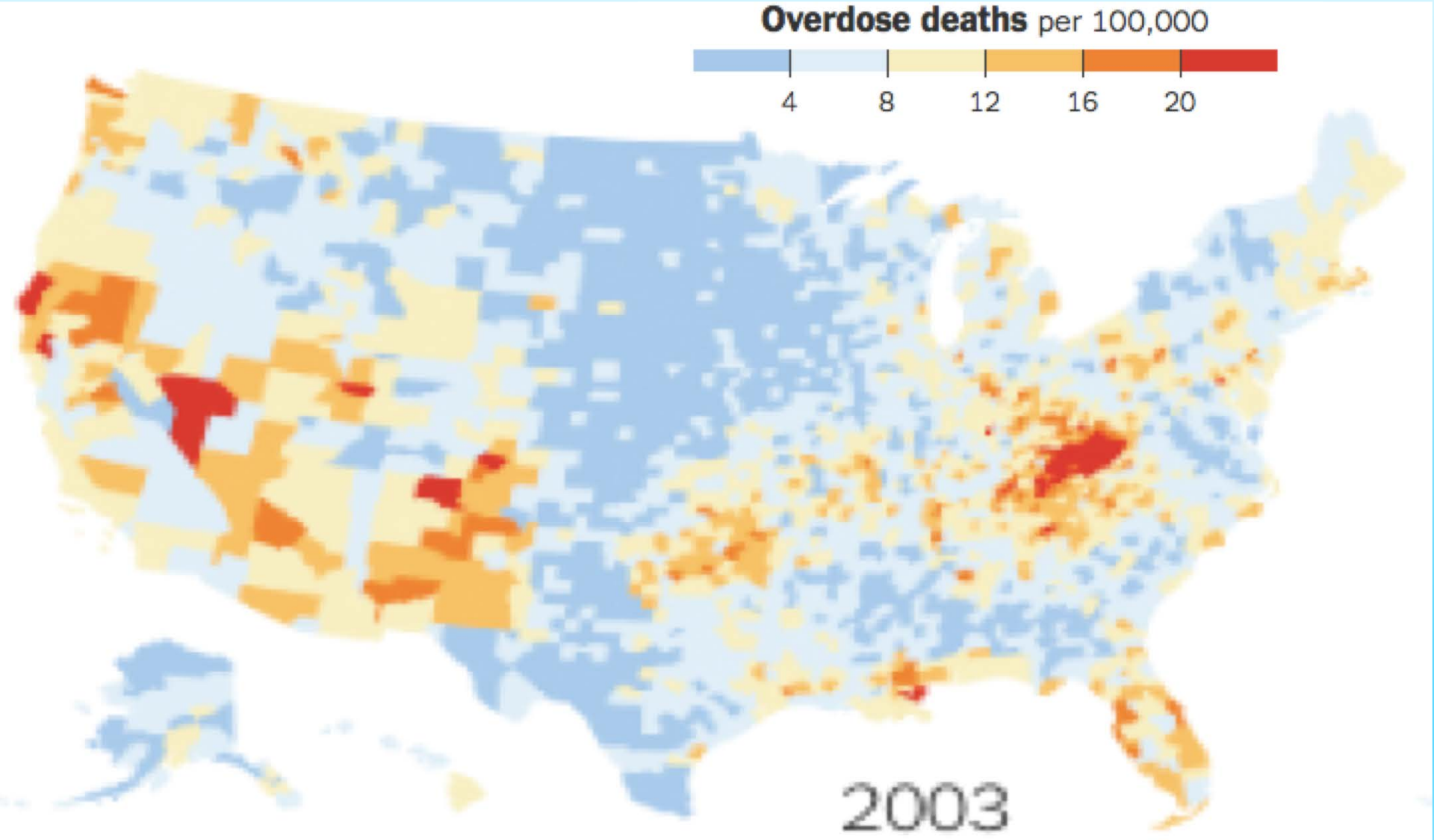


Opioid Analgesic OD Death Rates



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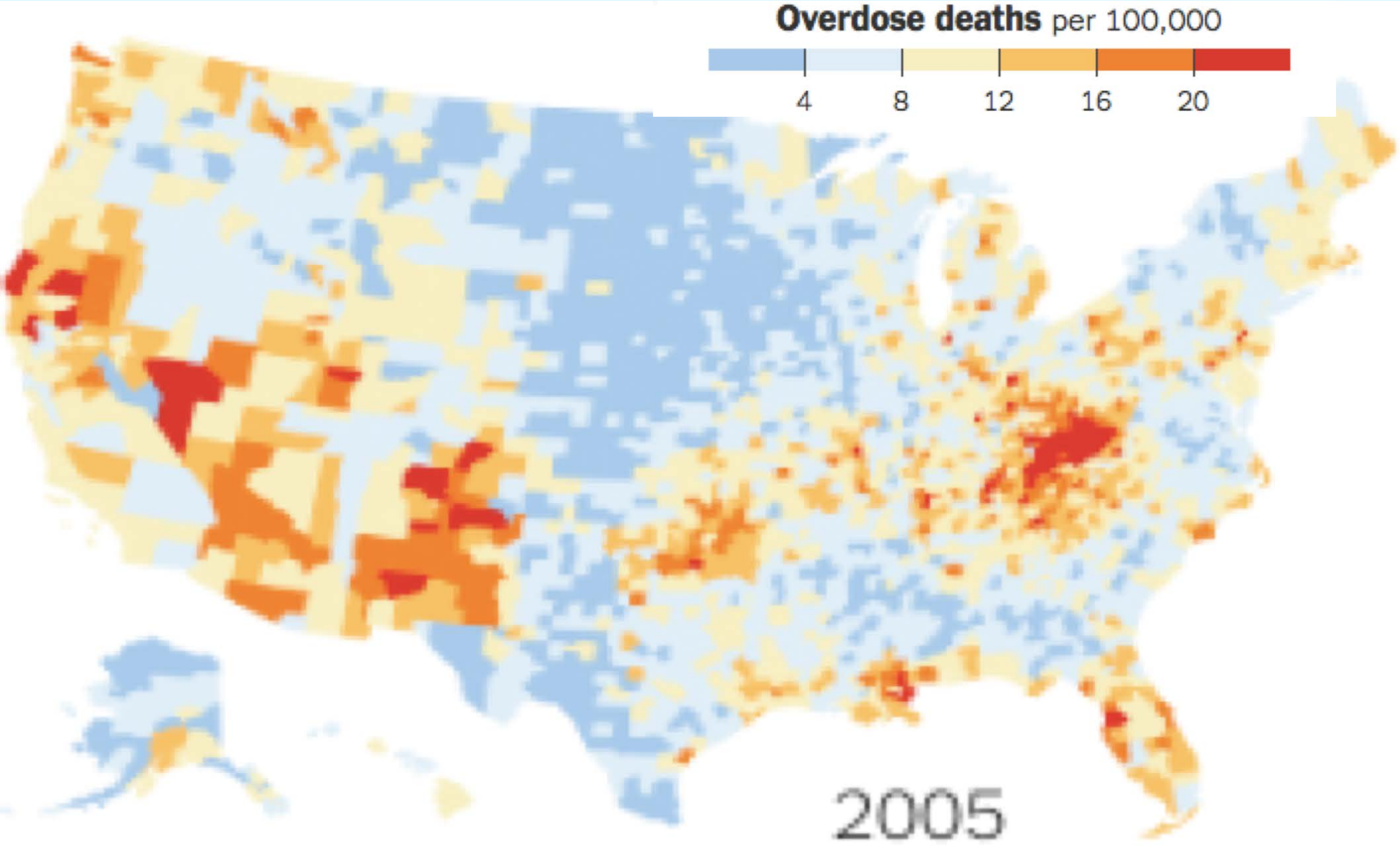

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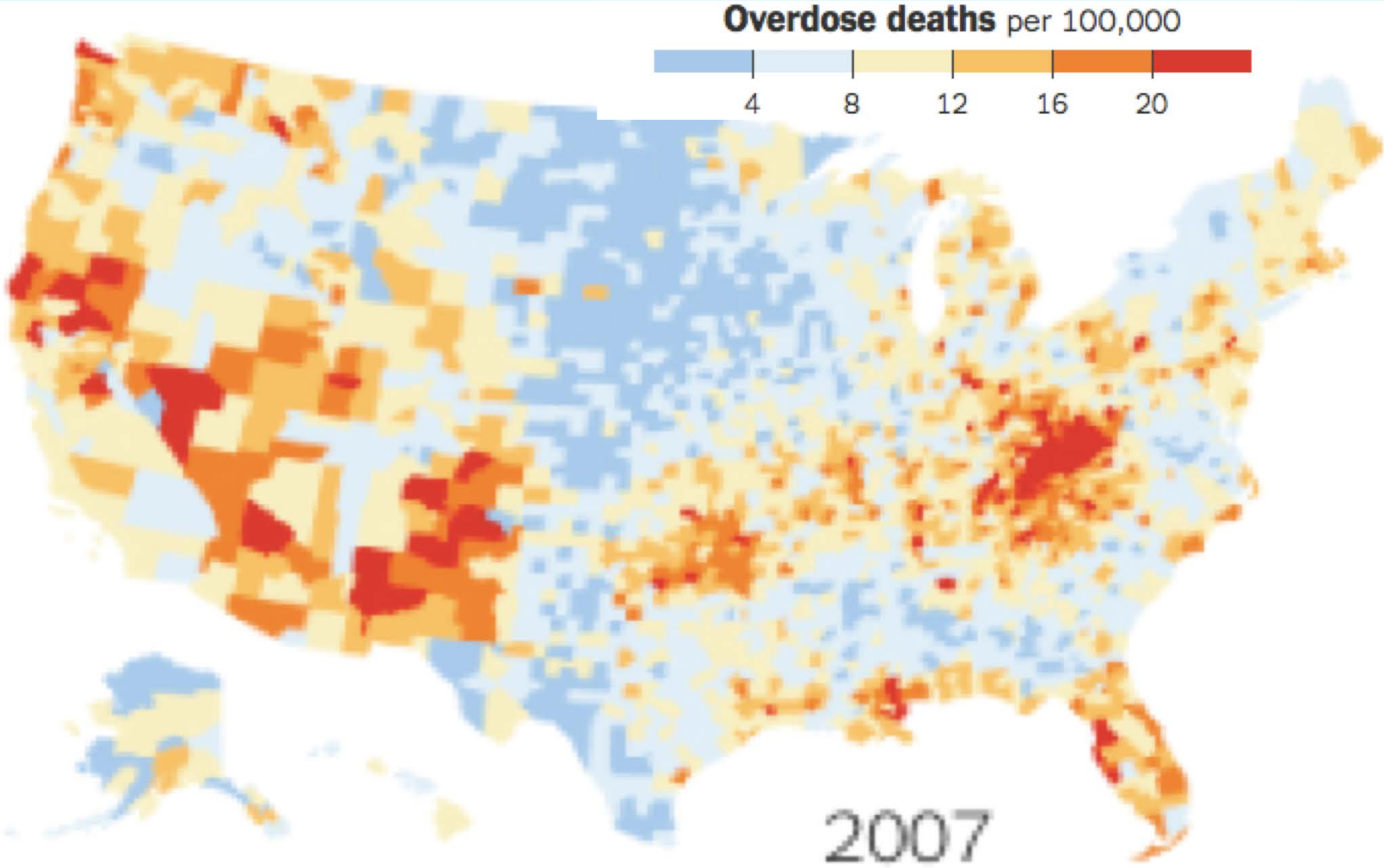

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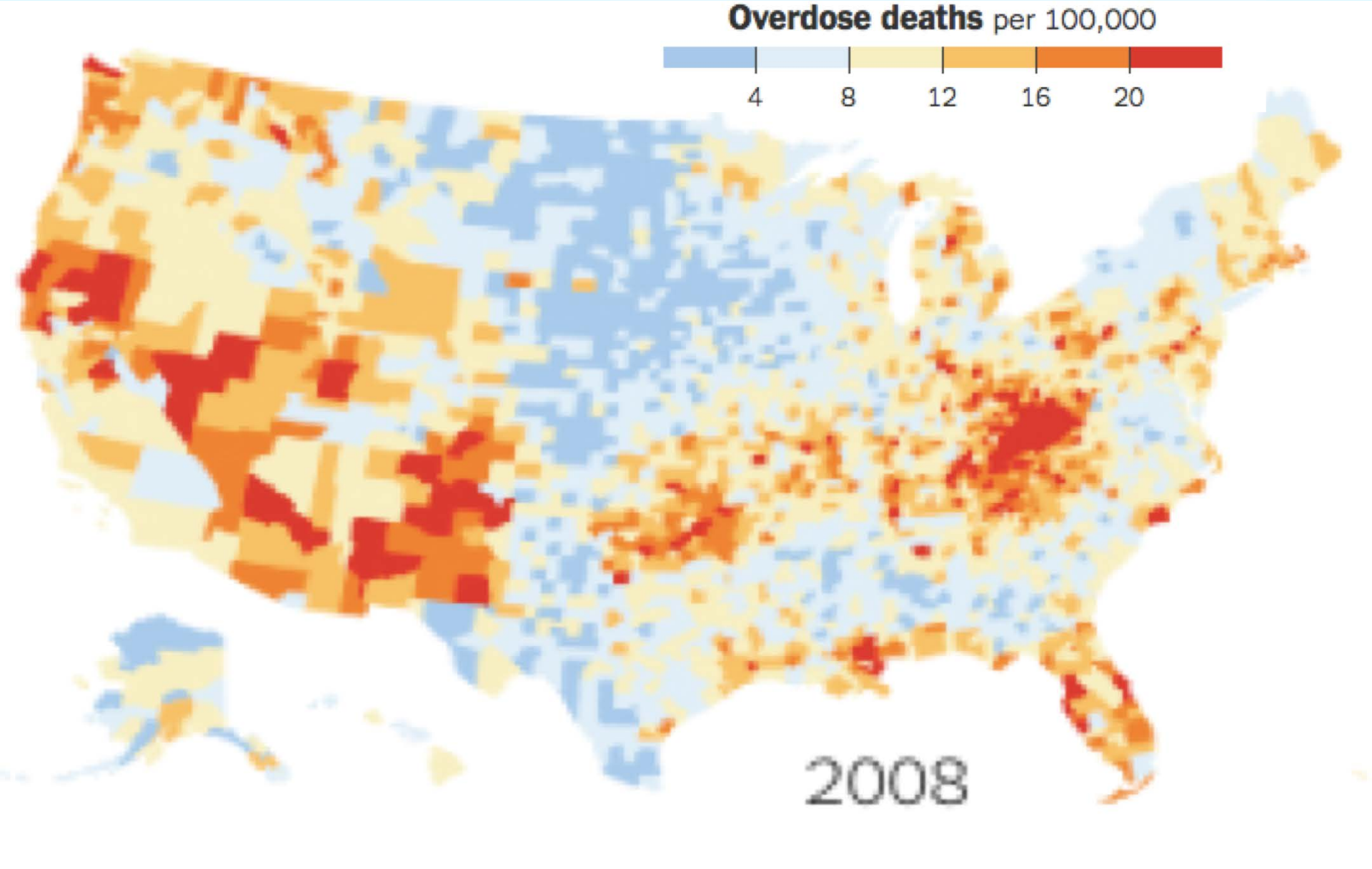

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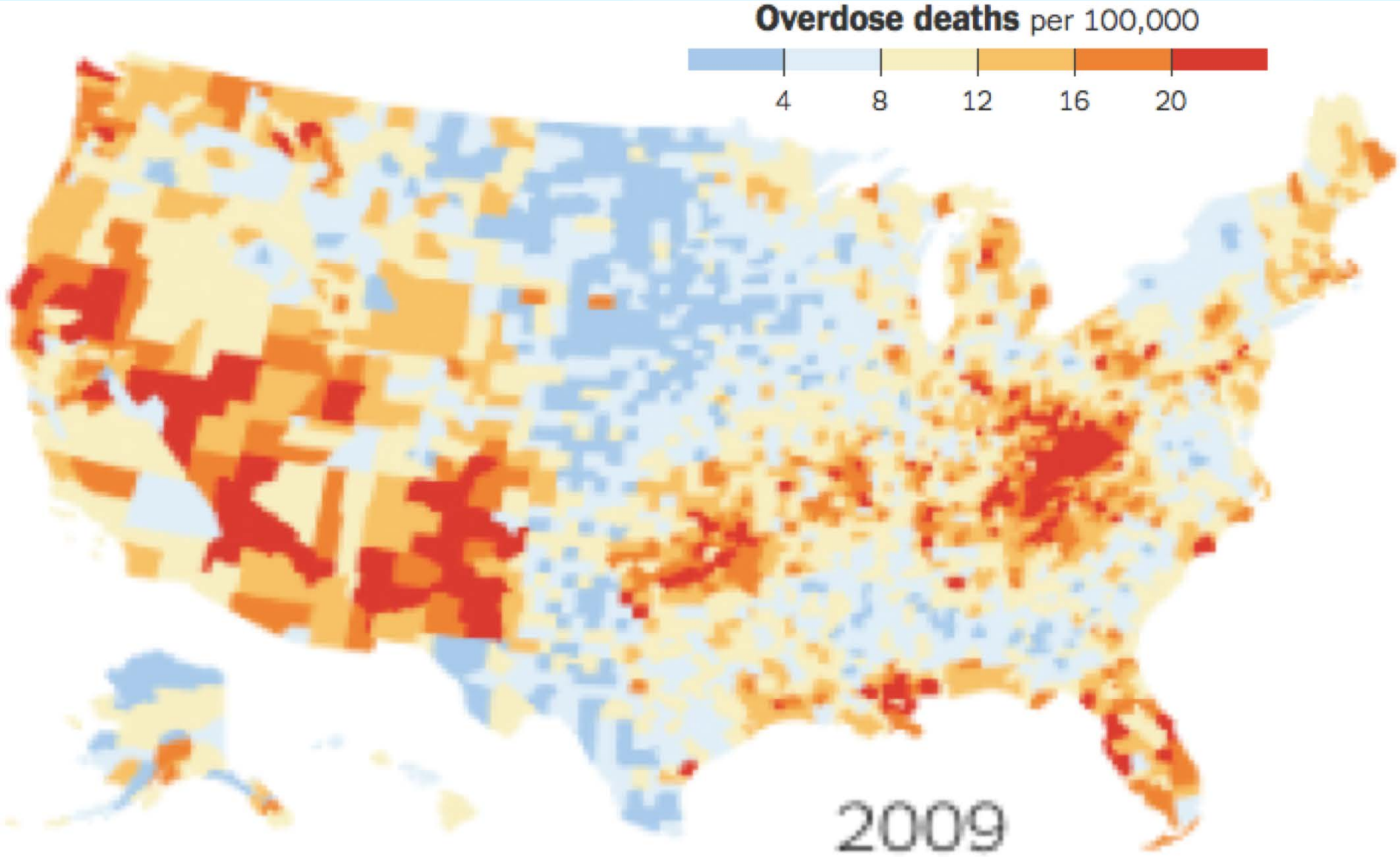

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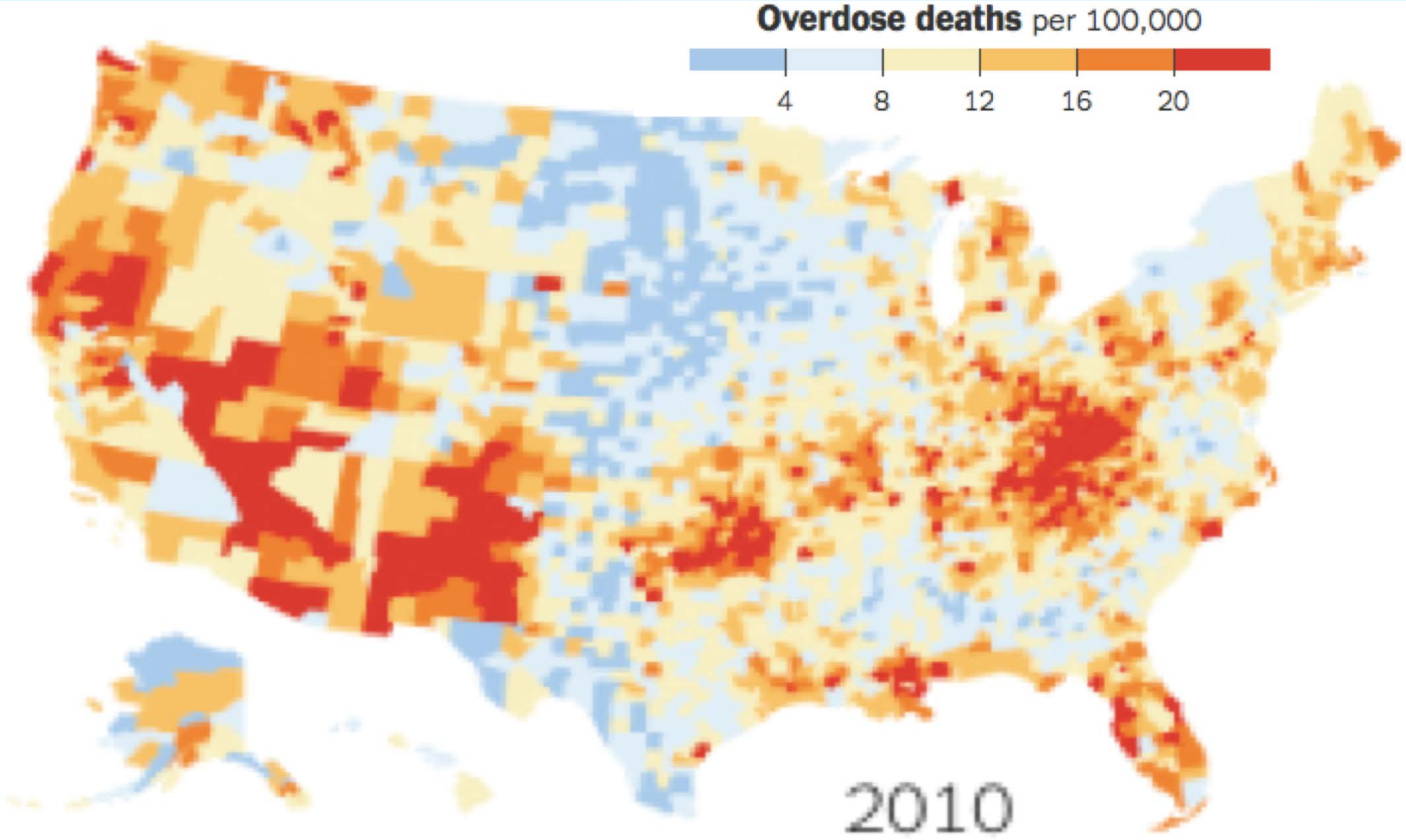

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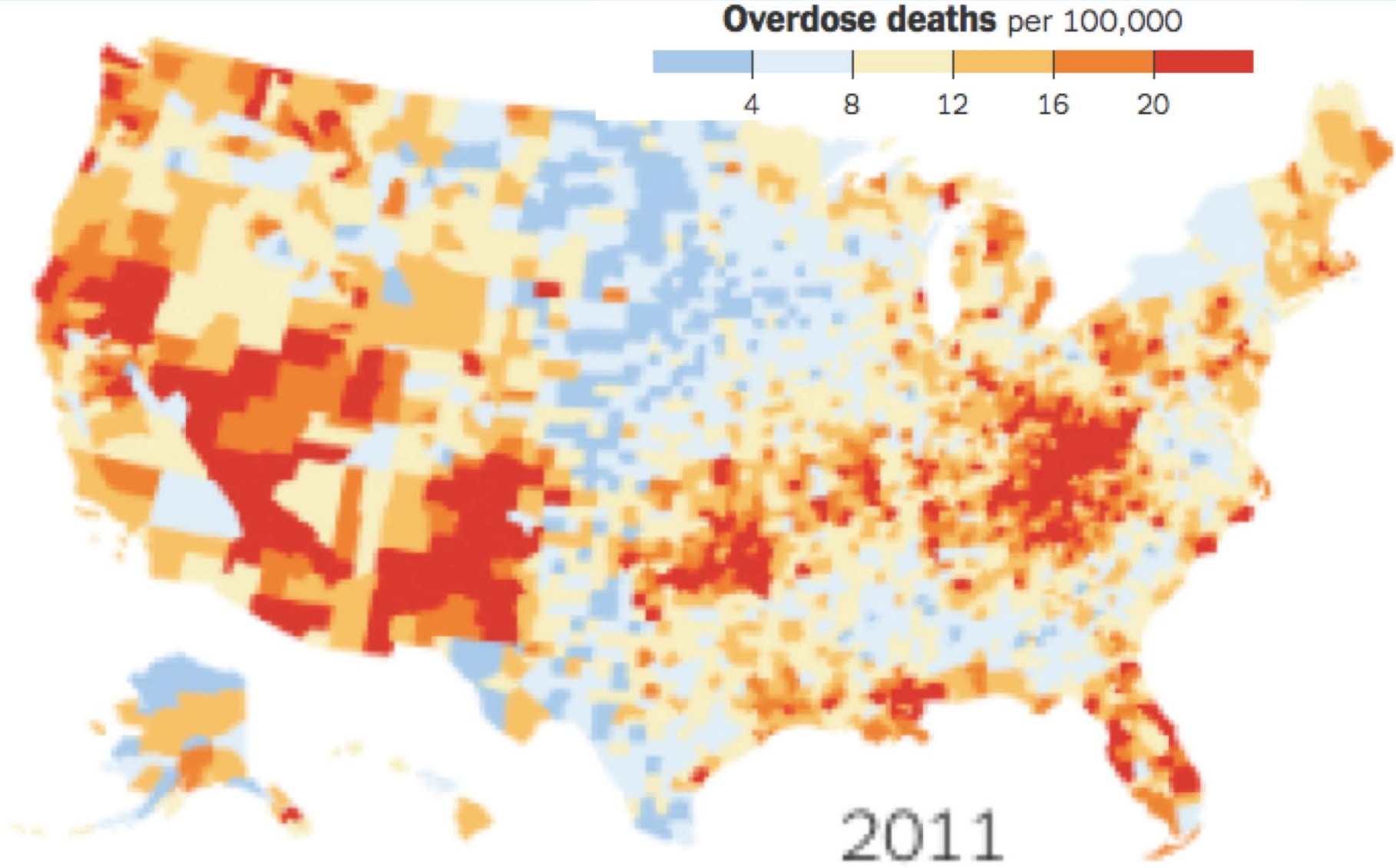

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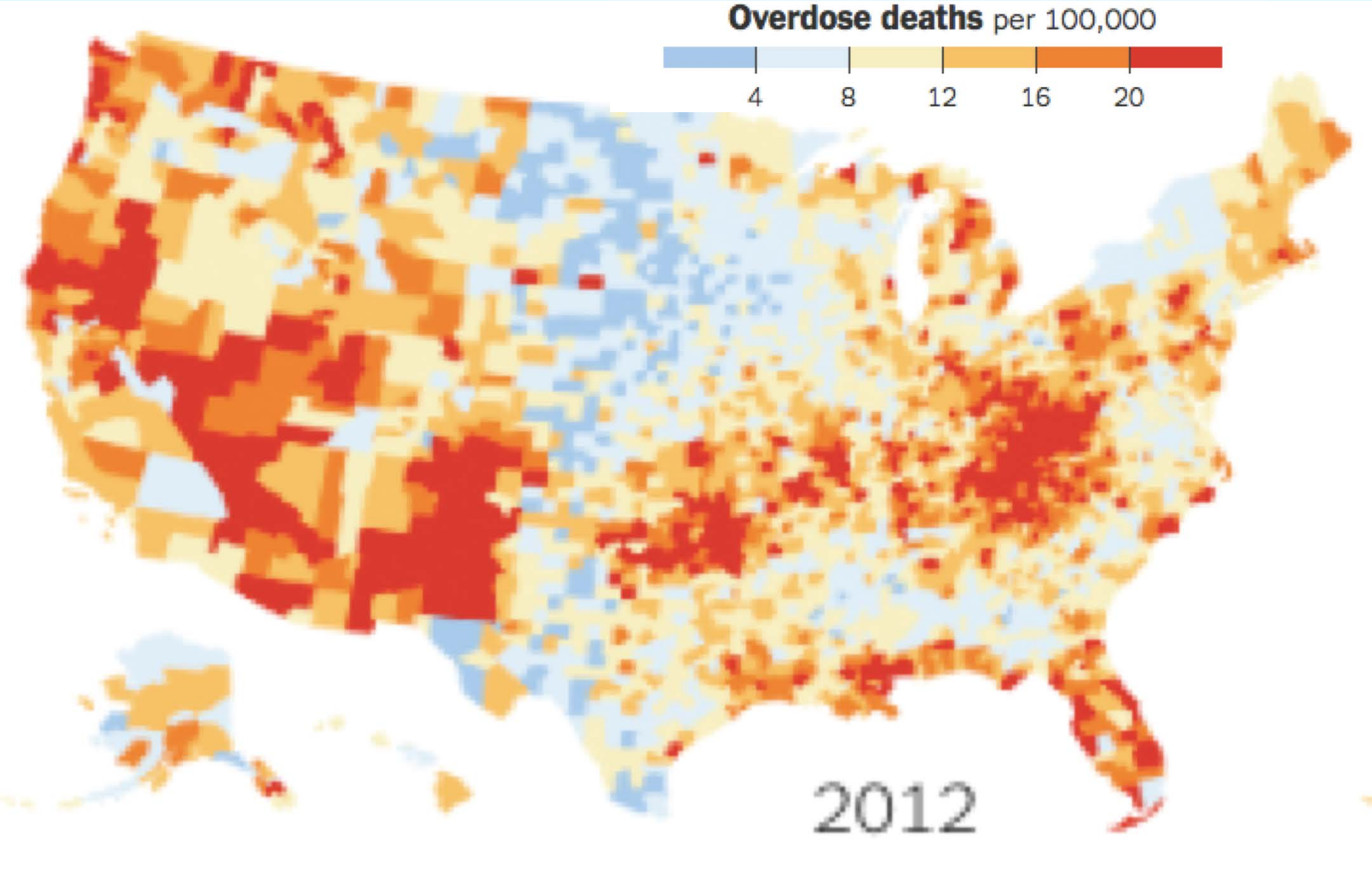

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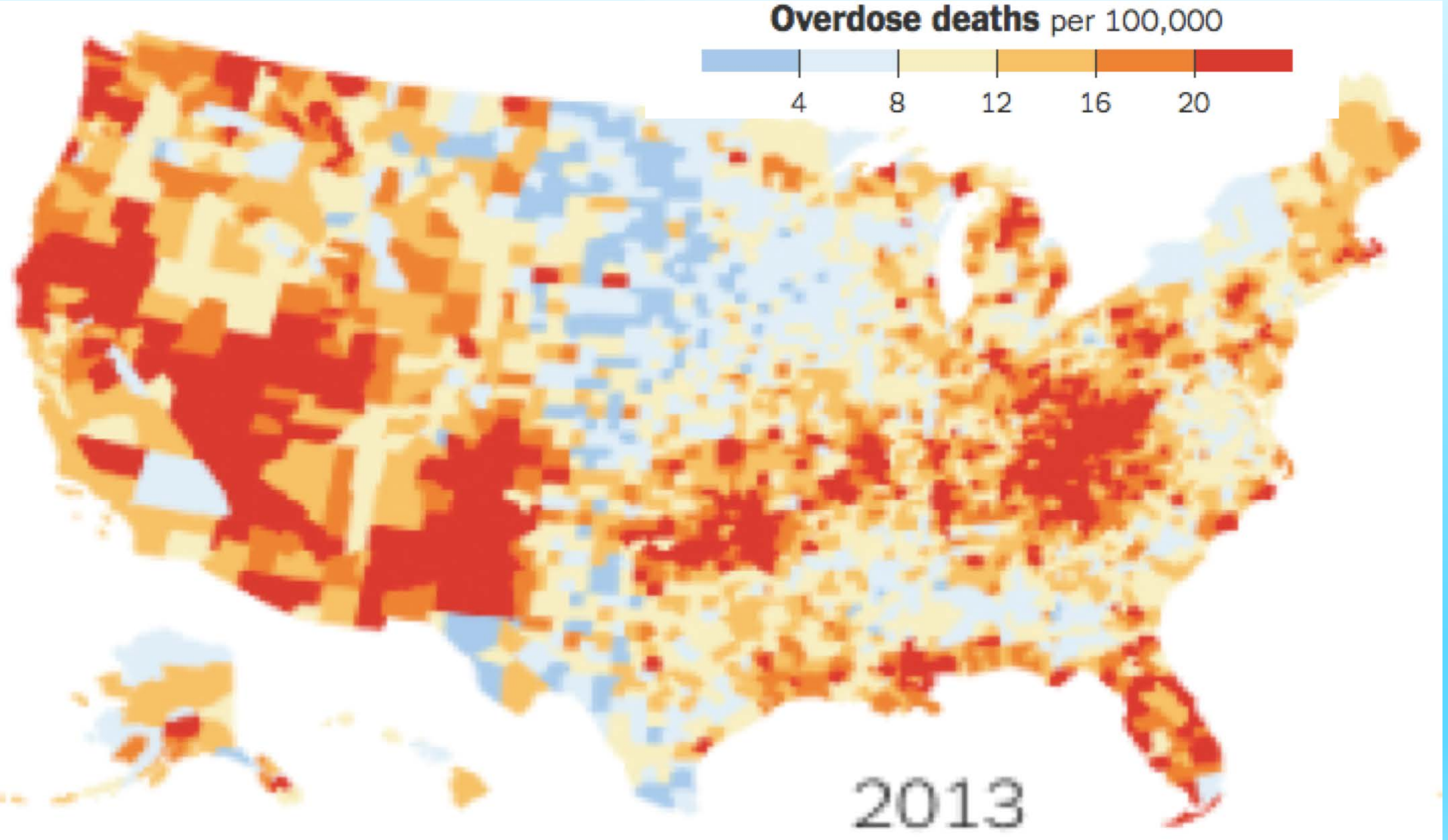

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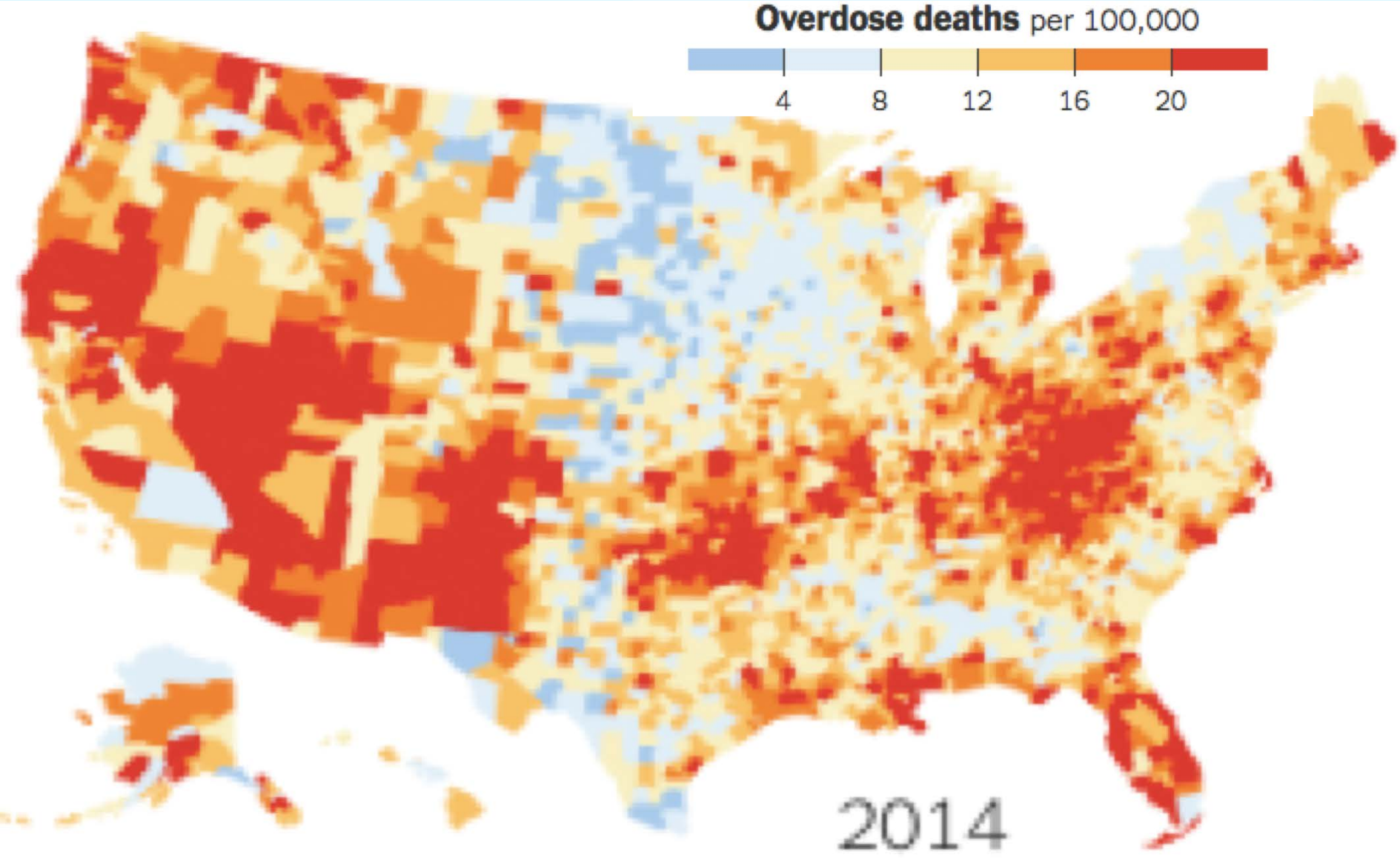
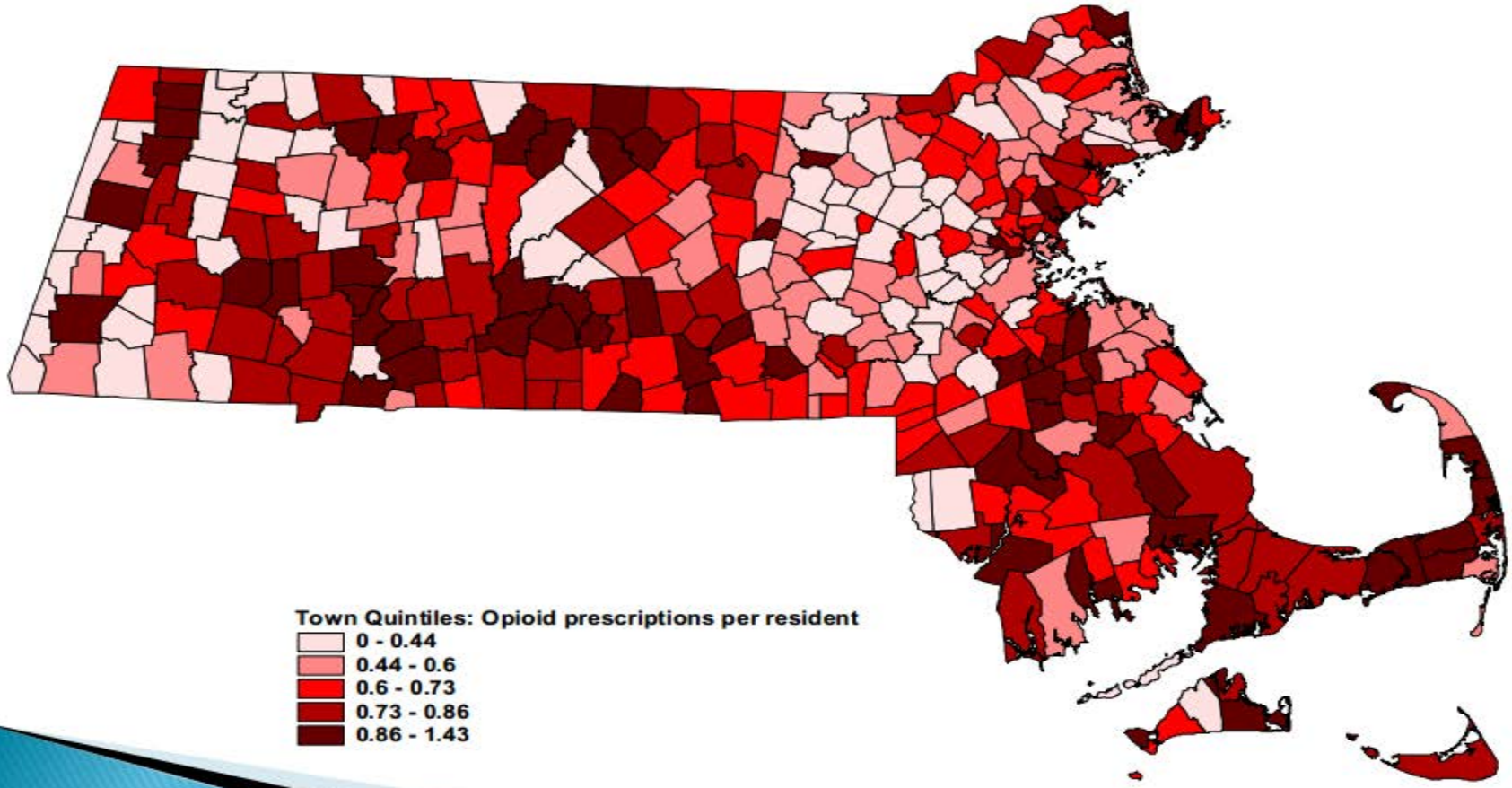
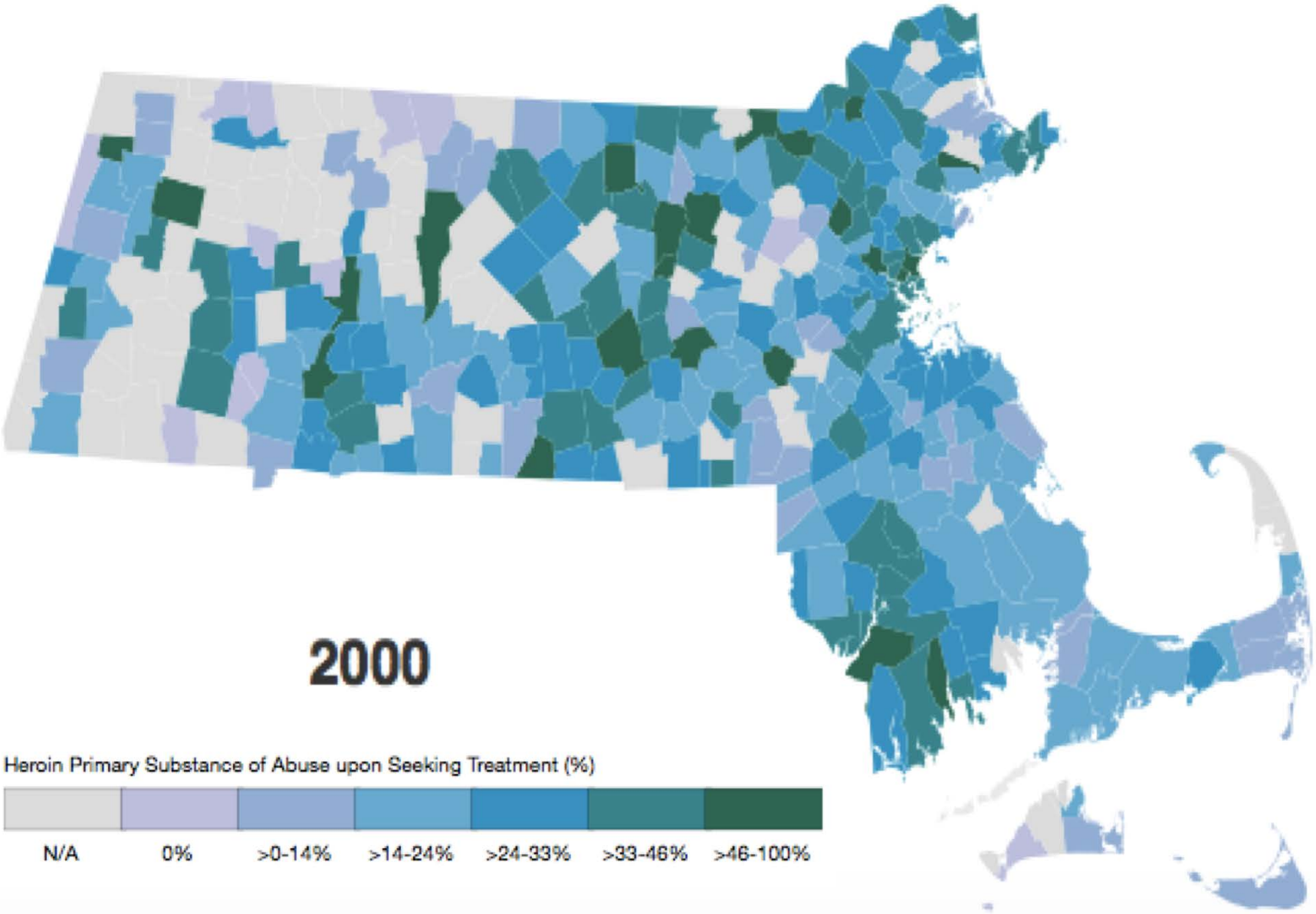


Right Here at Home

2012 Opioid Prescribing Rates:
Number of Schedule II - V Opioid Prescriptions per Town Resident



Percentage of Patients in Treatment Listing Heroin as their Primary Substance of Use



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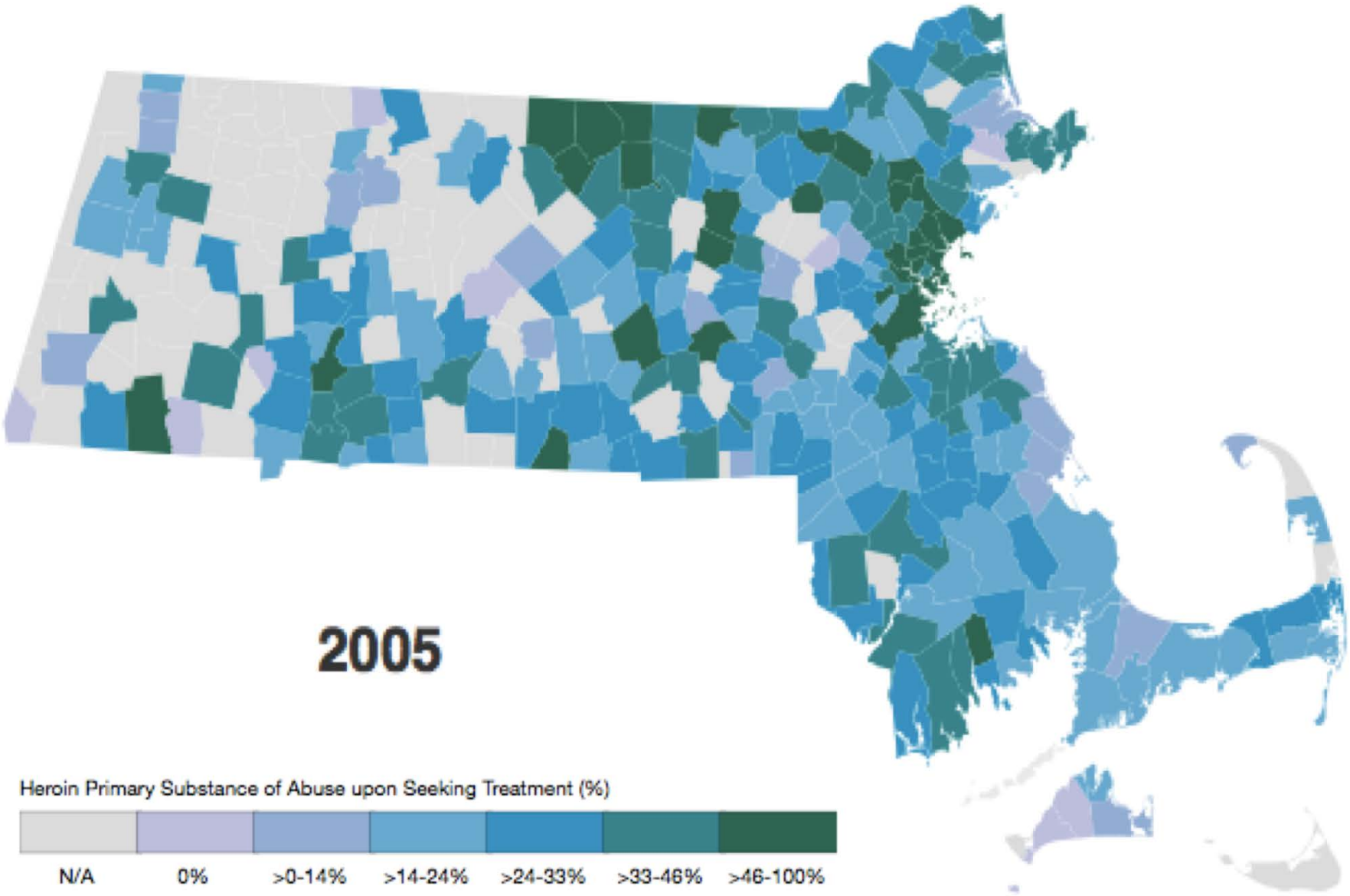

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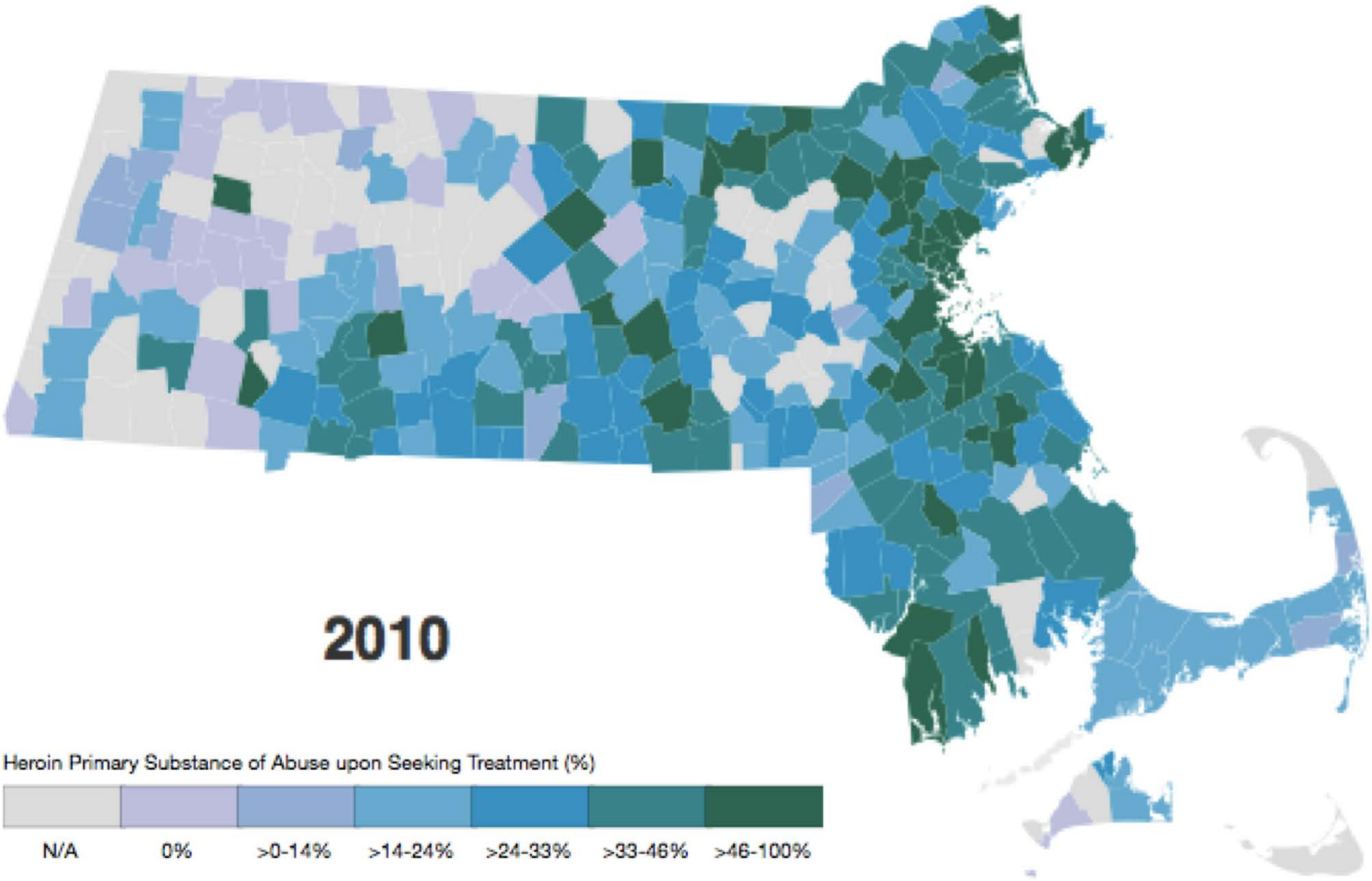

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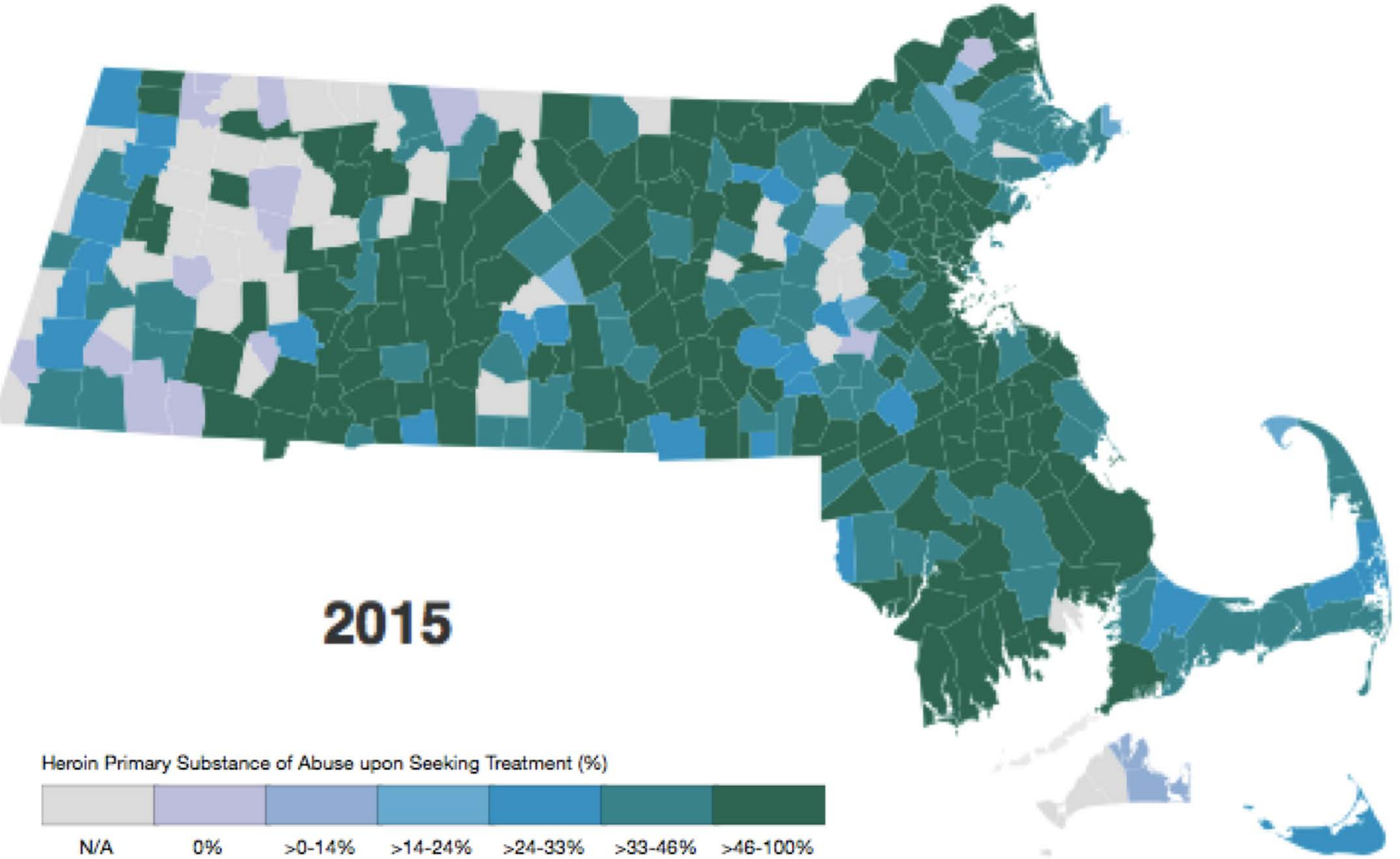
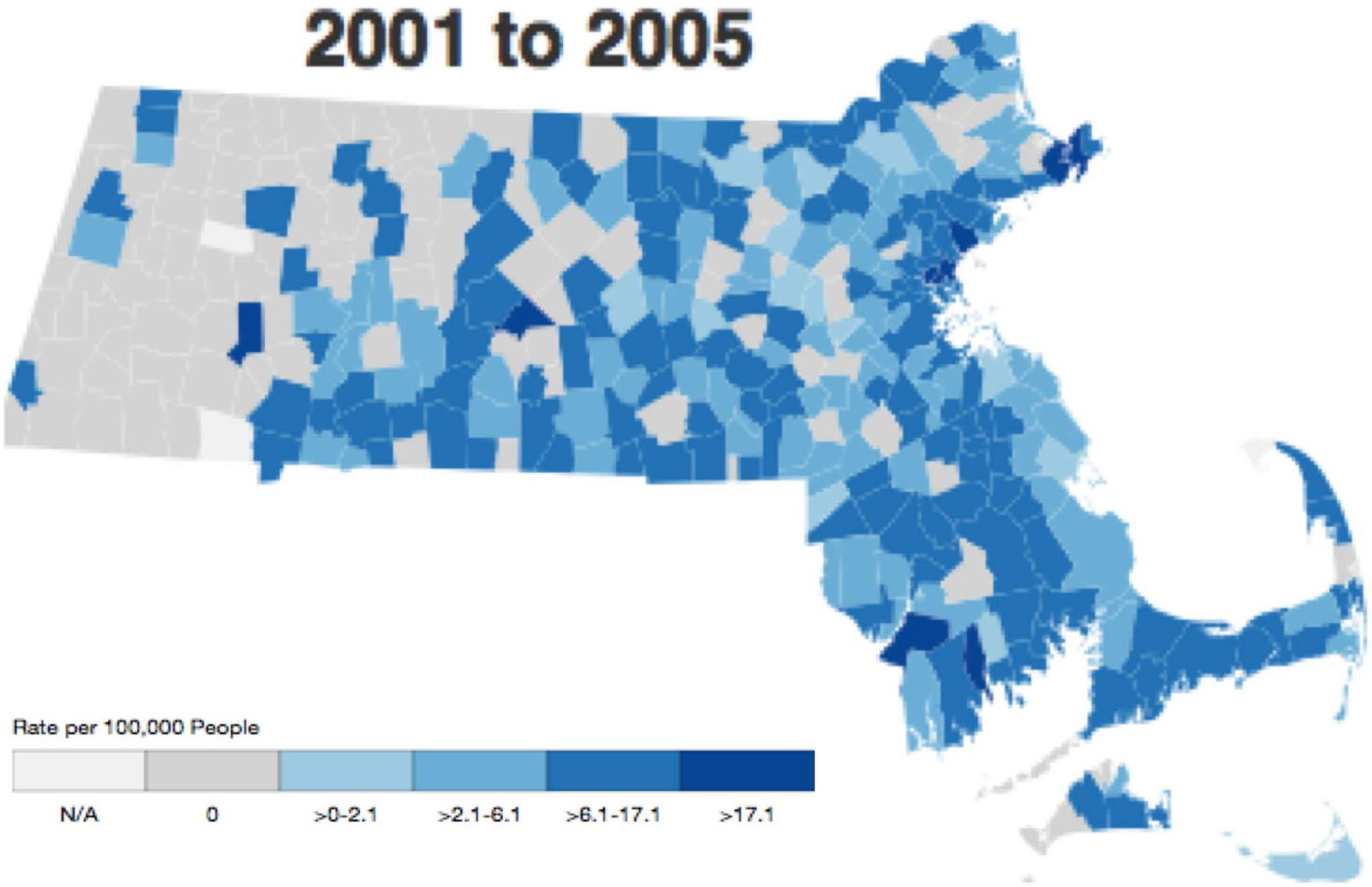


Unintentional Heroin Overdose Deaths in MA



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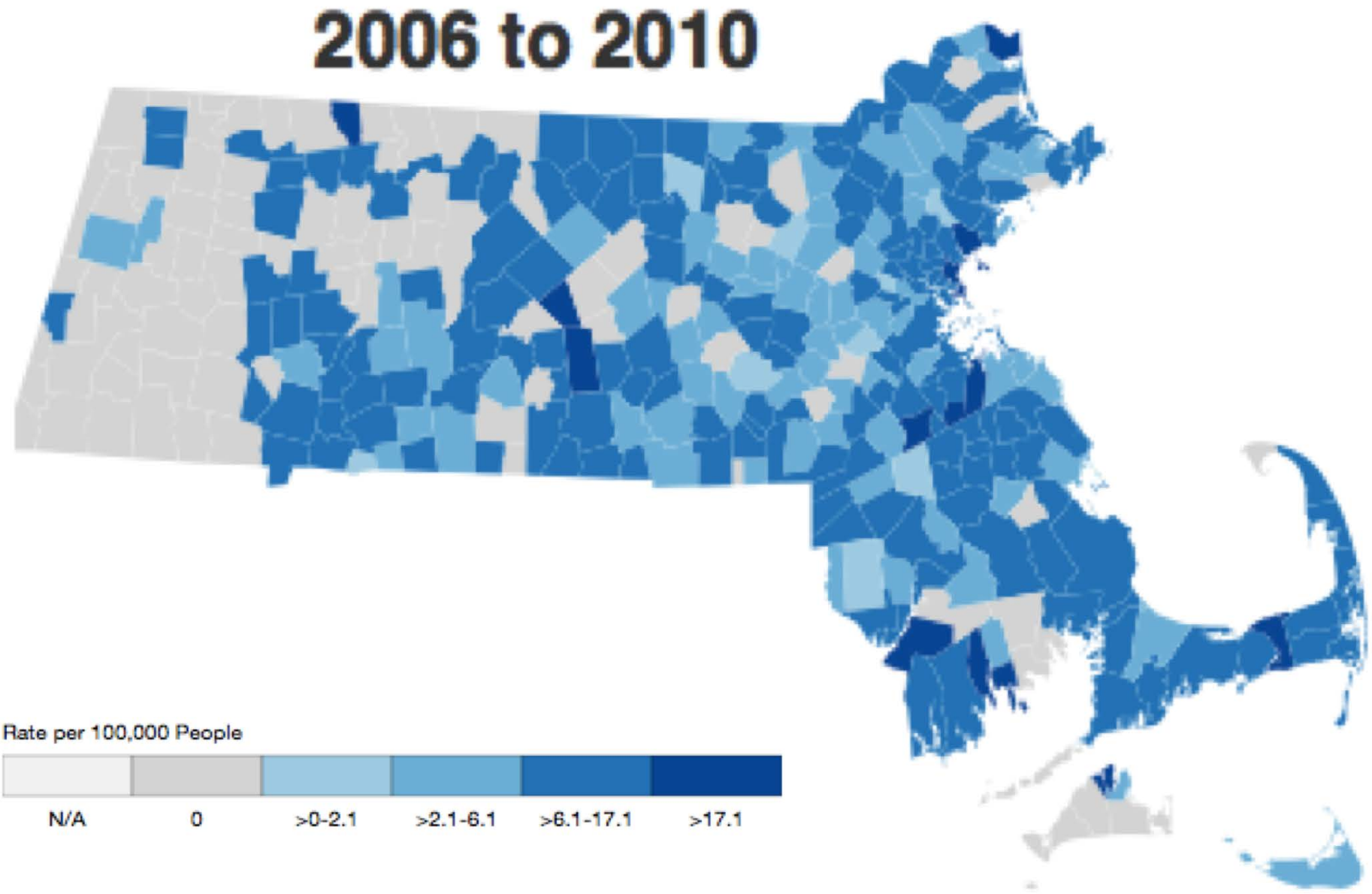

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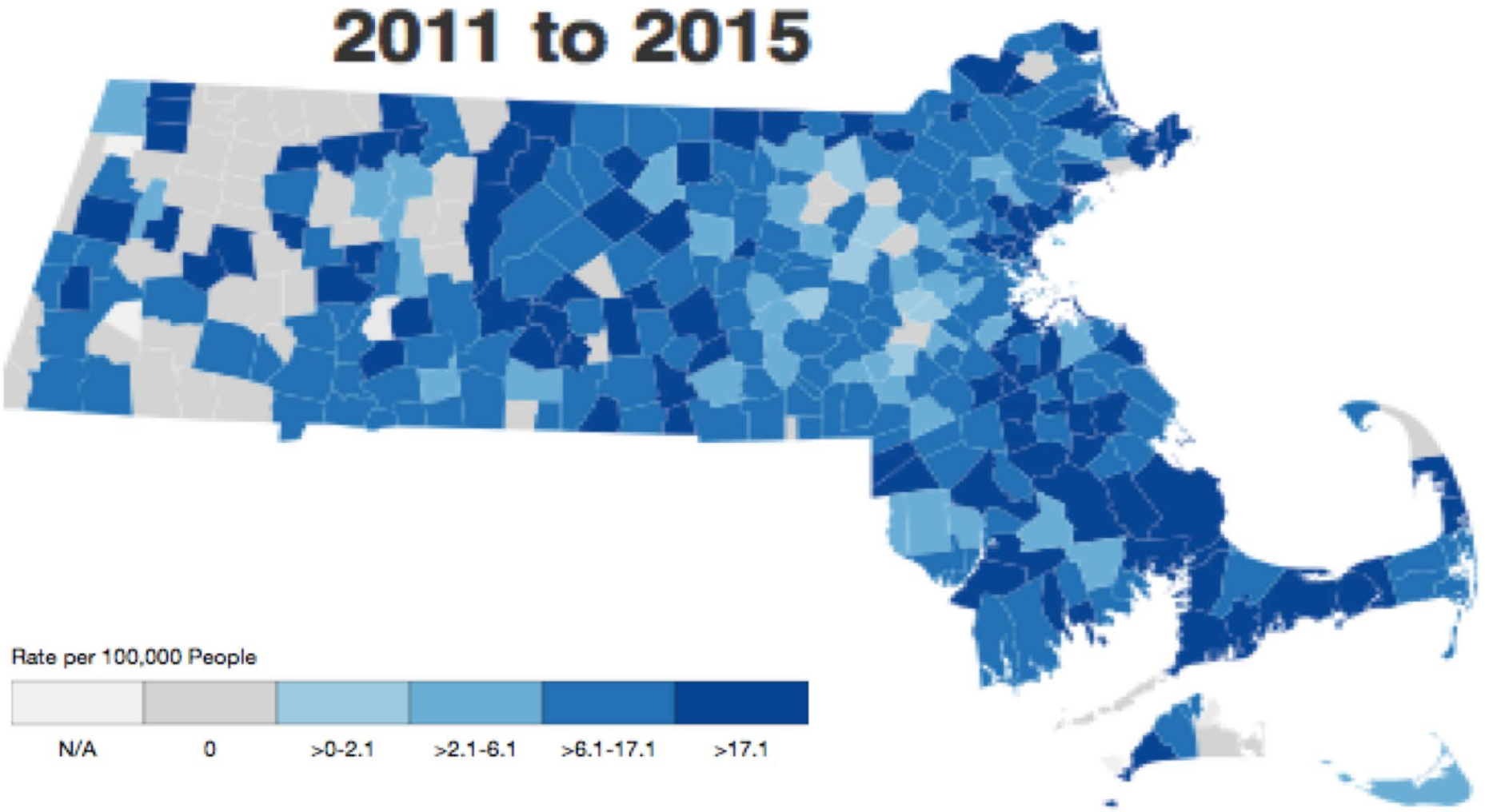

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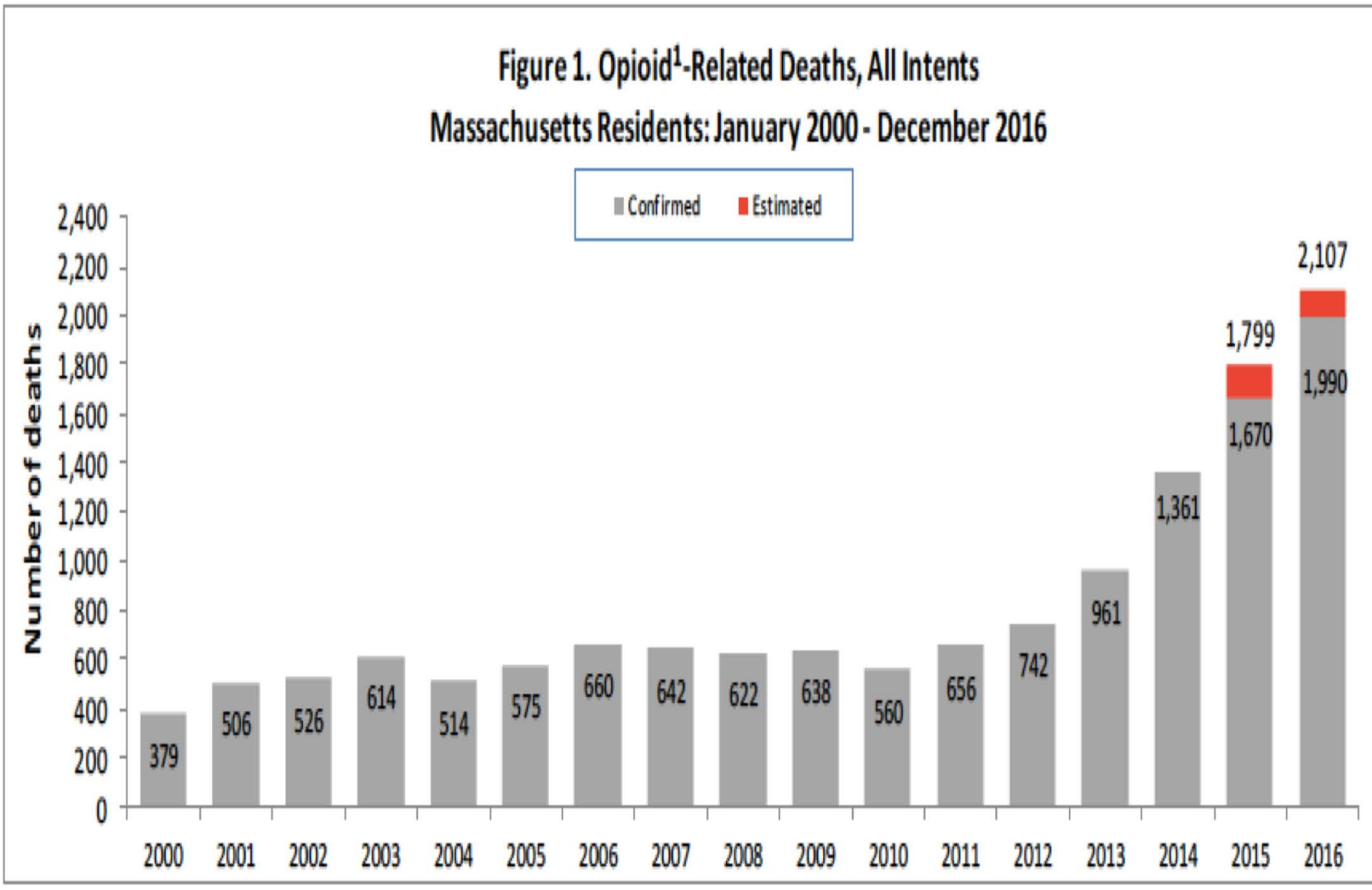

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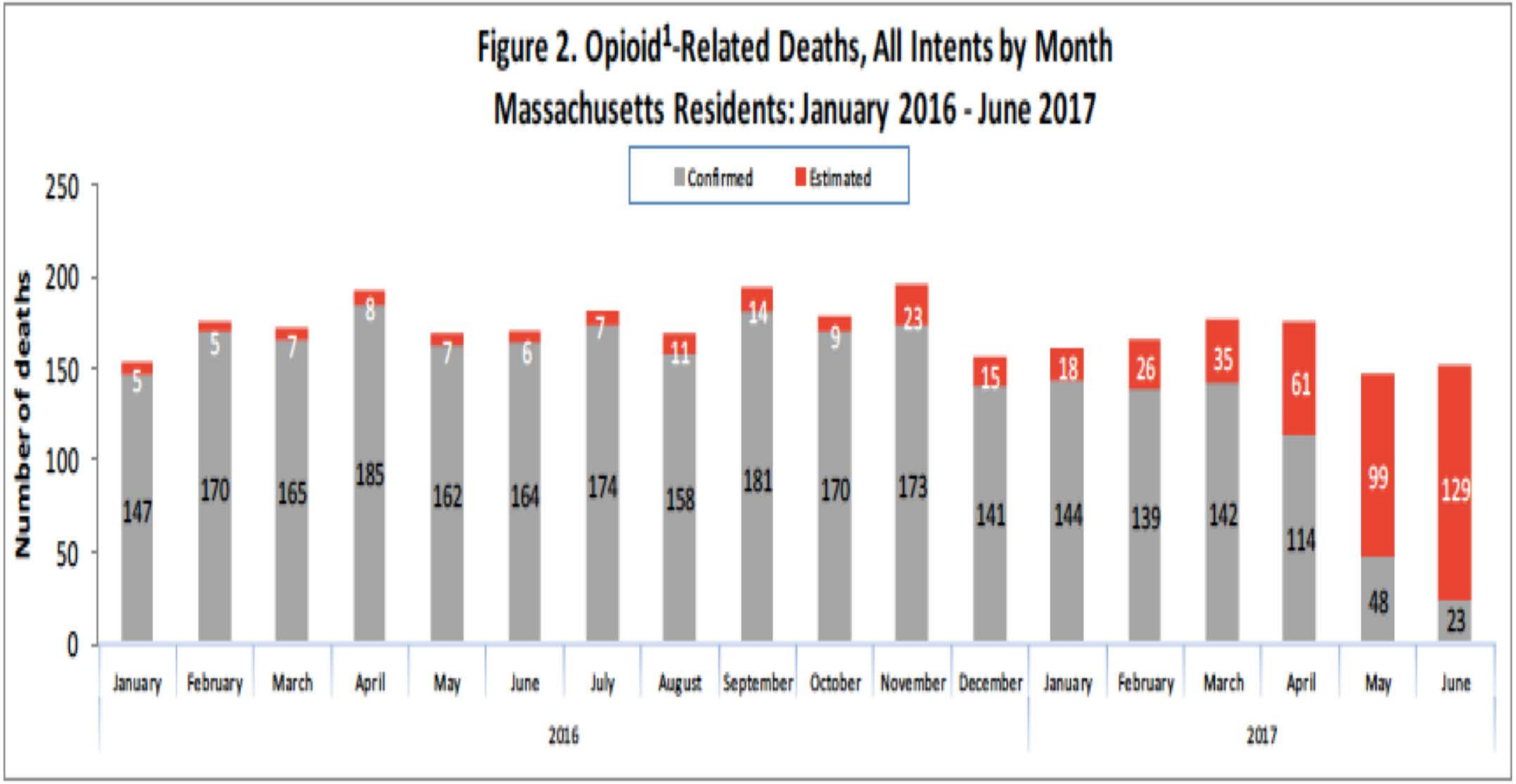


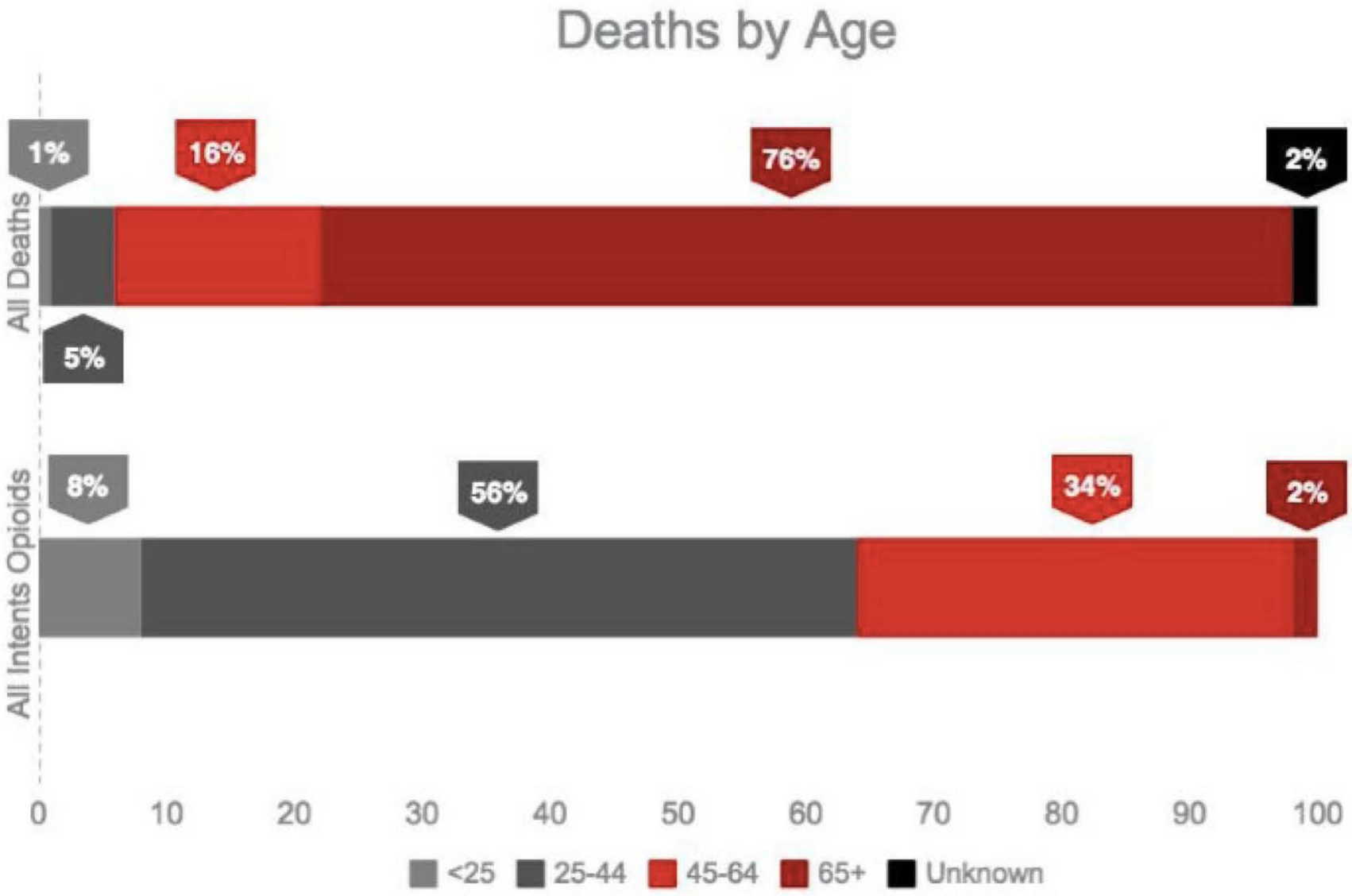
The chart above shows month-by-month estimates for all intents from January 2016 through June 2017. For the first 6 months of 2017, there are 610 confirmed cases of all intents opioid-related overdose deaths and DPH estimates that there will be an additional 330 to 406 deaths.

MA Opioid Overdose Deaths by Age
January – December 2016

Confirmed Opioid[1]-Related Deaths, All Intents
Compared to All Deaths by Age: January 2016-December 2016

	Deaths by Age: January 2016-December 2016								
	0-14	15-24	25-34	35-44	45-54	55-64	65+	Unknown	Total
All Deaths	370	463	1,196	1,400	3,031	6,009	43,014	1,317	56,800
Confirmed Opioid[1]-Related Deaths, All Intents	1	150	596	480	402	258	32	14	1,933

MA Opioid Overdose Deaths by Age
January – December 2016

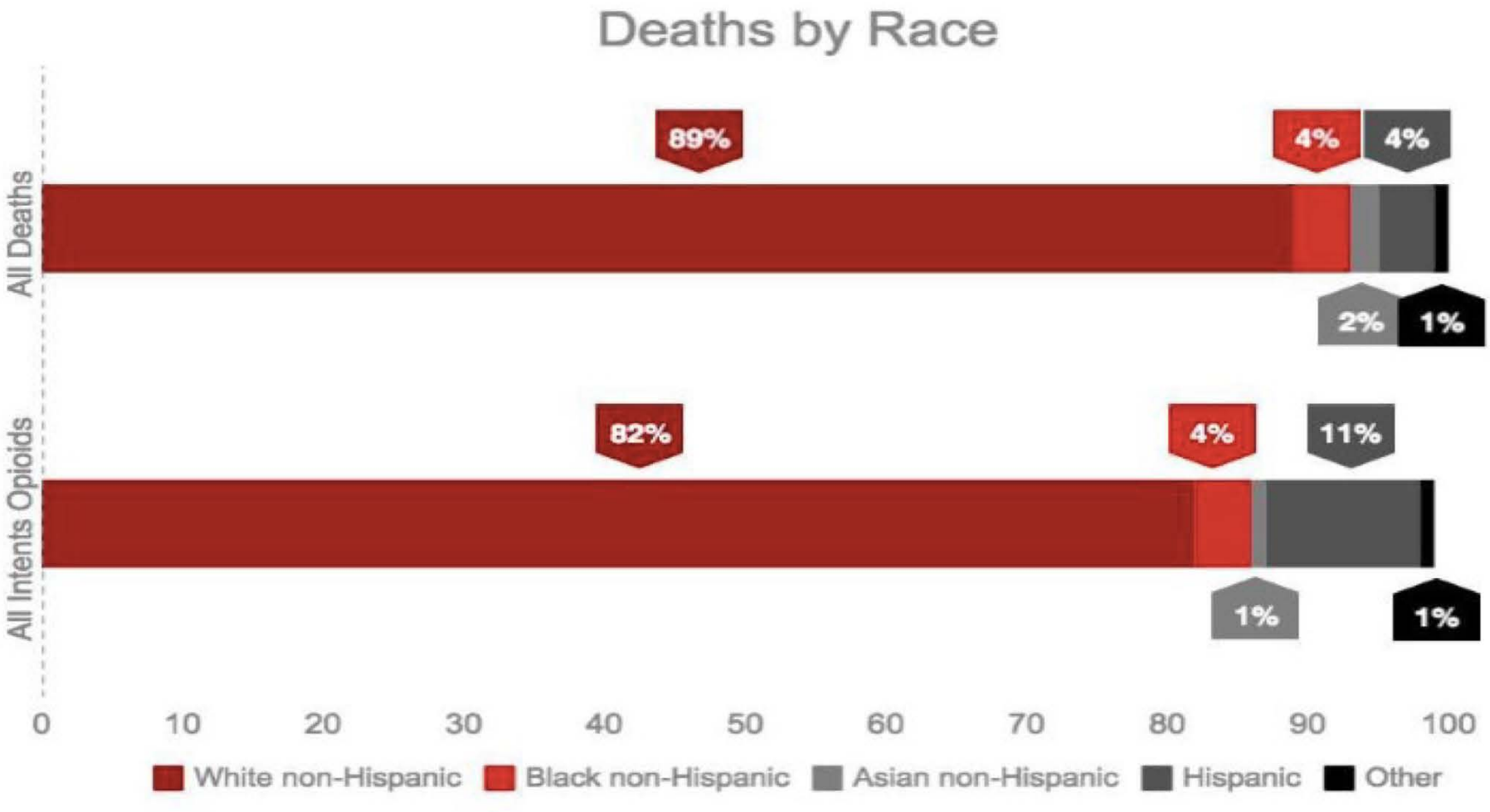


MA Opioid Overdose Deaths by Race
January – December 2016

Confirmed Opioid[1]-Related Deaths, All Intents
Compared to All Deaths by Race: January 2016-December 2016

	White non-Hispanic	Black non-Hispanic	Asian non-Hispanic	Hispanic	Other/ Unknown	Total
All Deaths	50,527	2,502	1,028	2,111	632	56,800
Confirmed Opioid[1]-Related Deaths, All Intents	1,590	82	14	221	26	1,933

MA Opioid Overdose Deaths by Race
January – December 2016



Note: Due to rounding, percentages under "All Intents Opioids" do not add up to 100%.

[1] Opioids include heroin, opioid-based prescription painkillers, and other unspecified opioids.

MA Prescription Monitoring Program County-Level Data

County (County classifications are by patient zip code; patient state must also = MA)	Census Population	Total Schedule II Opioid Prescriptions	Total Number of Schedule II Opioid Solid Dosage Units	Individuals Receiving Schedule II Opioid Prescription	% of Individuals Receiving Schedule II Opioid Prescription (of total population)	Individuals with Activity of Concern	Rate of Individuals with Activity of Concern (per 1,000)
Barnstable	214,990	113,486	7,068,323	30,146	14.0	465	15.4
Berkshire	130,016	63,015	3,627,531	14,932	11.5	160	10.7
Bristol	552,780	299,070	19,065,988	72,151	13.1	1,107	15.3
Dukes	17,256	8,704	595,884	2,462	14.3	22	8.9
Essex	762,550	288,345	17,208,100	84,517	11.1	946	11.2
Franklin	71,221	41,938	2,658,966	10,000	14.0	121	12.1
Hampden	467,319	285,285	17,770,362	71,999	15.4	1,162	16.1
Hampshire	159,596	75,911	5,164,695	17,855	11.2	189	10.6
Middlesex	1,552,802	427,499	25,593,366	139,180	9.0	1,515	10.9
Nantucket	10,399	4,548	218,004	1,369	13.2	5	3.7
Norfolk	681,845	241,216	15,159,612	72,975	10.7	923	12.6
Plymouth	501,915	235,010	14,937,973	66,038	13.2	1,039	15.7
Suffolk	755,503	232,597	15,049,960	72,114	9.5	1,050	14.6
Worcester	809,106	332,626	23,336,013	88,395	10.9	1,264	14.3
MA	**6,745,408**	**2,653,358**	**167,737,123**	**733,783**	**10.9**	**9,968**	**13.6**

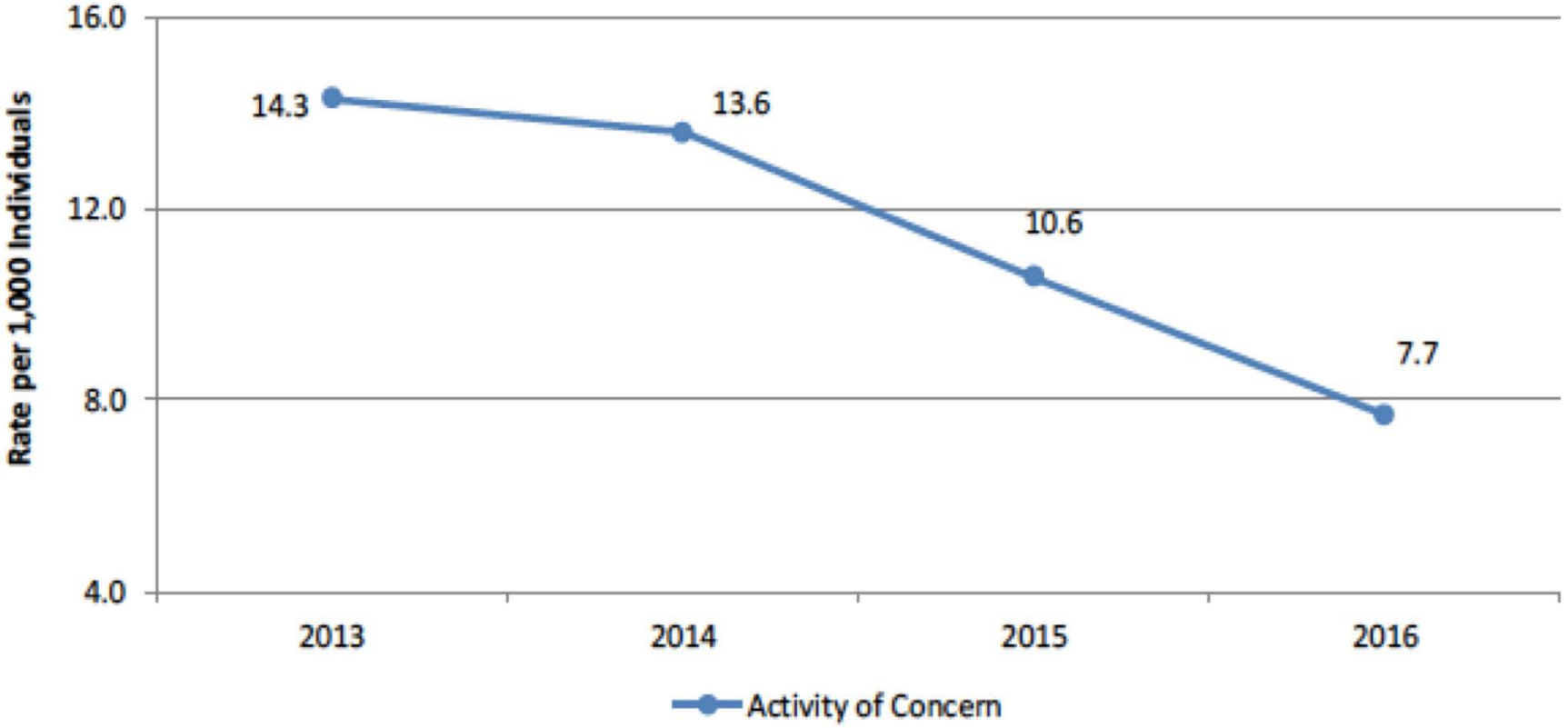
MA Prescription Monitoring Program County-Level Data May 2017

MA Prescription Monitoring Program: April 2017 – June 2017

County (County classifications are by patient zip code; patient state must also = MA)	Census Population	Total Schedule II Opioid Prescriptions	Total Number of Schedule II Opioid Solid Dosage Units	Individuals Receiving Schedule II Opioid Prescription	% of Individuals Receiving Schedule II Opioid Prescription (of total population)	Individuals with Activity of Concern	Rate of Individuals with Activity of Concern (per 1,000)
Barnstable	214,276	25,374	1,432,643	11,414	5.3	19	1.7
Berkshire	126,903	14,892	810,777	6,476	5.1	<5	NR
Bristol	558,324	73,990	4,487,217	31,267	5.6	21	0.7
Dukes	17,246	1,611	92,592	817	4.7	<5	NR
Essex	779,018	75,312	4,136,184	34,760	4.5	22	0.6
Franklin	70,382	10,024	595,653	4,054	5.8	<5	NR
Hampden	468,467	62,565	3,655,319	26,649	5.7	29	1.1
Hampshire	161,816	17,446	1,093,030	7,128	4.4	<5	NR
Middlesex	1,589,774	106,900	5,757,663	53,556	3.4	45	0.8
Nantucket	11,008	1,105	43,538	541	4.9	<5	NR
Norfolk	697,181	57,327	3,253,694	27,724	4.0	31	1.1
Plymouth	513,565	55,172	3,266,634	25,454	5.0	21	0.8
Suffolk	784,230	51,803	3,118,818	24,351	3.1	27	1.1
Worcester	819,589	84,729	5,379,002	37,678	4.6	35	0.9
MA	6,811,779	638,250	37,122,764	291,869	4.3	250	0.9

MA Prescription Monitoring Program County-Level Data

Figure 3. Rate[1] of Individuals with Activity of Concern[2] in MA[3] 2013–2016



[1] Rates of individuals with activity of concern are based on the population of individuals who have received one or more Schedule II opioid prescriptions.

[2] "Activity of Concern" is defined as an individual who received prescriptions for one or more Schedule II opioid drugs from four or more different prescribers and had them filled at four or more pharmacies during the specified time period.

[3] Activity of concern rates include only MA Residents

Global Picture

Where Do Opioids Come From?

Opioids

Opiates:	Opium
	Morphine
	Codeine
Semi-Synthetic	Heroin
	Hydrocodone
	Hydromorphone
	Oxycodone
	Oxymorphone
	Buprenorphine
Synthetic	Fentanyl
	Methadone
	Tramadol

Opioids Differ

Drug	Duration	Potency
Methadone	24-32 hours	****
Heroin	6-8 hours	*****
Oxycontin	3-6 hours	*****
Codeine	3-4 hours	*
Demerol	2-4 hours	**
Morphine	3-6 hours	***
Fentanyl	2-4 hours	********

Chart from OOD Prevention & Reversal Trainers Manual-BPHC

Most Widely-used Opioids in the U.S.

- Vicodin – A powerful pain reliever prescribed for acute episodes of pain (injury, post surgery) and chronic pain. Most abused prescription in the U.S. (Hydrocodone and Acetaminophen)

- OxyContin – A powerful opiate originally formulated to time-release its effects. Easily overridden and abused. New formulations have made OxyContin less desirable on the streets, contributing to an increase in heroin and fentanyl.

- Heroin – The most widely used non-prescription opiate. It is estimated that more than half of people currently using heroin began opiate use from a prescription.

The Current Nightmare

FENTANYL

Origins of Fentanyl

- Developed in 1959 in Belgium by Dr. Paul Janssen
  - Analgesic 50 x stronger than morphine
  - Many times more powerful than heroin and far cheaper and easier to manufacture
- Quickly adopted in medical settings as a pain reliever and intravenous anesthetic (Sublimaze)

A Young Pain-killer Grows Up

- Analogues are quickly developed
  - Slight molecular reformulation of fentanyl to enhance different effects
- Duragesic® is developed in 1992
  - Delivers fentanyl via a transdermal patch
  - Used in chronic pain management
- Actiq® available to the public in 1999
  - Dissolved in the mouth (fentanyl lollipop)
  - Intended for opioid-tolerant individuals
  - Found effective in treating breakthrough pain in cancer patients, because of its potency.

The Darker Path

- Illicit use of pharmaceutical fentanyl first appeared in the mid-1970s in the medical community.

- The first documented presence of fentanyl on the streets was in Los Angeles, CA 1979 under the name of "*China White*".

The Evil Analogues

In addition to the many legal analogues produced over the years at least 12 different illegal fentanyl analogues have been identified by law enforcement in the U.S.

Analogues are sometimes produced to circumvent the various regulations in a variety of countries. The U.S. has laws to circumvent this effort.

The source for many of these analogues are clandestine laboratories in countries like Mexico and “legitimate” factories in China.

The China Connection

Chinese companies are:

- **Pressing various analogues into pills and selling online to a variety of countries including the U. S.**

- **Where the pills can not be sold, companies are selling key ingredients to assist people in manufacturing their own analogues.**

- **Companies are also selling machinery used to press pills and mold plates for a variety of legal pills.**

Black Market Fentanyl Economics

Traffickers manufacturing Fentanyl often purchase key ingredients from China, which does not regulate its sale.

A small investment in ingredients, can translate to a tremendous profit margin . . .

From the Drug Dealer's Perspective

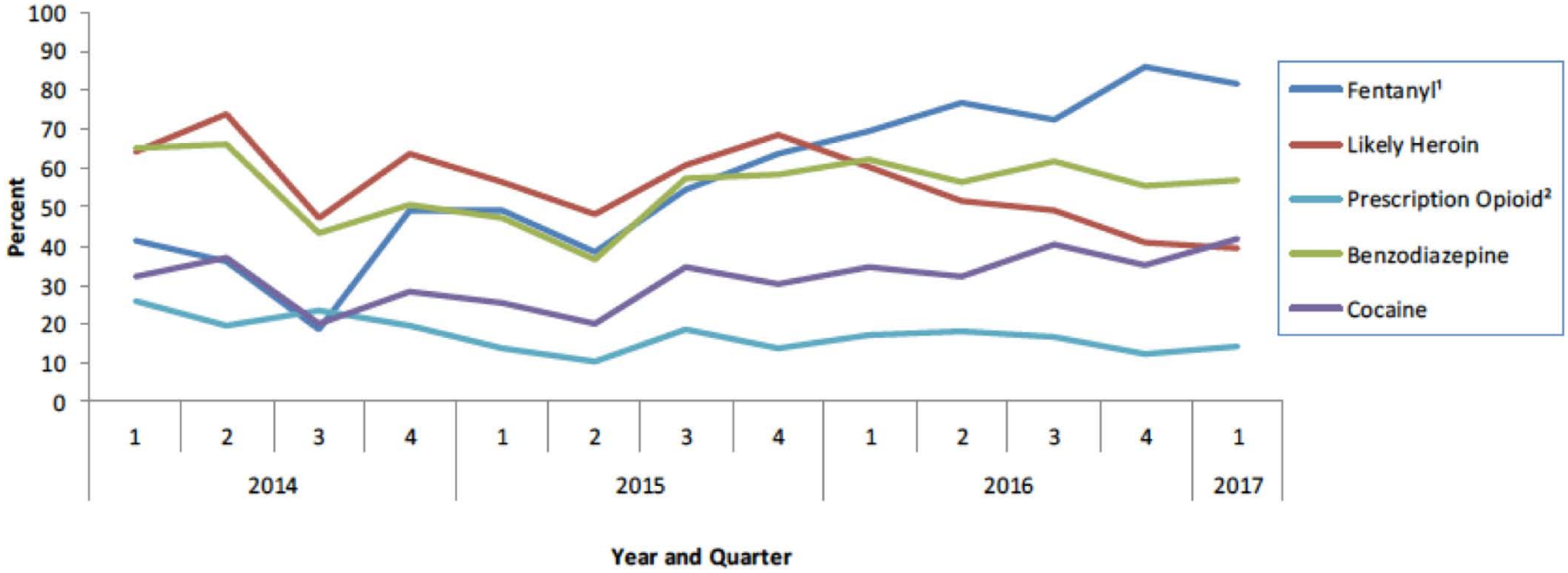
- Heroin is expensive to produce and import
  - Plants, cultivation, harvesting, refining, importing
- Chemicals can be shipped into the U.S. or other countries cheaply
- It's potency makes volumes easier to ship (cars instead of trucks, planes vs. boats)

Who's Buying and Manufacturing?

- Variety of companies in China are manufacturing and exporting with little regulation
- Small cells in the U.S. and Canada, individuals or small crews around the countries
- Larger cartels in Central and South America, mostly Mexico and most of that product ends up in the U.S and Canada.
- Because it is so much cheaper to produce than heroin and 50 -120 x more potent than morphine, fentanyl is often times being used to "cut" heroin or replace it entirely.

Drugs Present in Opioid Overdose Deaths

Figure 4. Percent of Opioid Deaths with Specific Drugs Present MA: 2014-2017

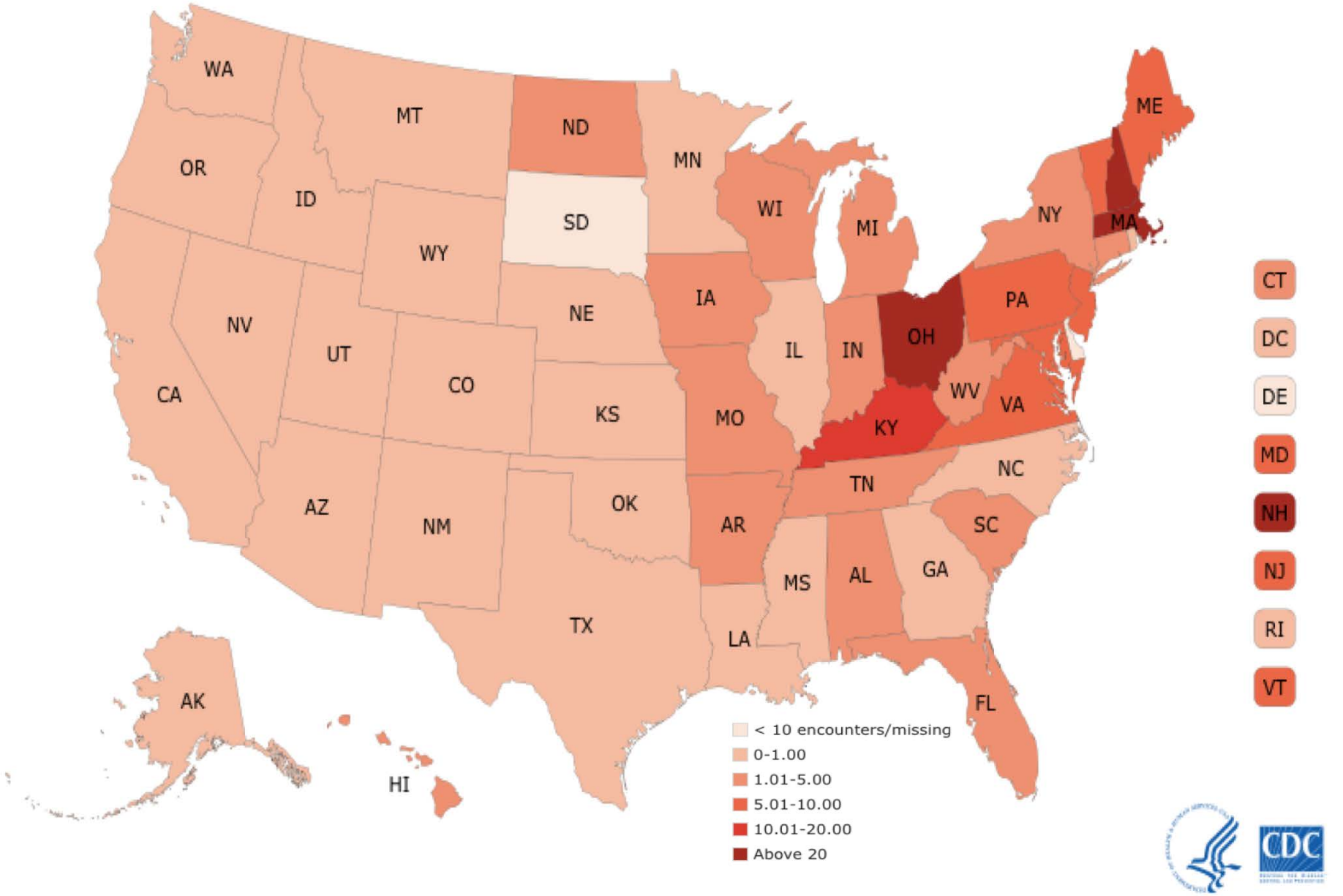


1. This is most likely illicitly produced and sold, **not** prescription fentanyl
2. Prescription opioids include: hydrocodone, hydromorphone, oxycodone, oxymorphone, and tramadol

Please note that previous estimates may change slightly as DPH routinely receives updated toxicology data from the Office of the Chief Medical Examiner and the Massachusetts State Police.

MA Toxicology Data Post Mortem

Fentanyl Report in NFLIS by State 2016



Top 10 states by total Fentanyl Seizures, 2016

Rank	State	Number of Fentanyl seizure
1	Ohio	1355
2	Massachusetts	870
3	Pennsylvania	449
4	Maryland	402
5	New Jersey	390
6	Kentucky	252
7	Virginia	243
8	Florida	209
9	New Hampshire	198
10	Indiana	144

The Impact Massachusetts

- A continued drop in death rates involving heroin, which have decreased at approximately the same rate that **fentanyl**-related deaths have increased.

- A continued rise in the number of fentanyl-related deaths with **88-89 percent of deaths** in Q4 of FY16 that had a toxicology screen showing a positive result for **fentanyl**.

What's the Difference?

Heroin	Fentanyl
• Derived from the alkaloids found in the Poppy plant.	• Human made through chemicals
• Formulated to be 15 times stronger than morphine**	• Formulated to be 100 times stronger than morphine
• Schedule I drug with no recognized legitimate use	• Schedule II drug with limited medical use
• Stimulates opioid receptors in the brain & brainstem	• Stimulates opioid receptors in the brain & brainstem
• Will show up on a routine general opioid screening test	• Will **NOT** show up on a routine general opioid screening test

The Catch

What makes fentanyl different from other opioids?

- Fentanyl binds faster than any other opiate for an elevated feeling of euphoria
- Fentanyl is 50 -120x stronger than Morphine and 25-50x stronger than Heroin
- Smaller margin for error regarding overdose

What Sets Fentanyl Apart

Amounts required for a lethal overdose

What Sets Fentanyl Apart

Fentanyl works exactly like all other opioids, just significantly faster which is what makes it more "potent".

Where overdose from other opioids usually takes 1 to 3 hours, overdose from fentanyl can occur in as little as **5 to 10 minutes**.

What Sets Fentanyl Apart

Wood Chest

Fentanyl Induced Chest Wall Rigidity

- A condition which causes a seizing of the chest muscles
- Makes rescue breathing and CPR ineffective
- Can be reversed with Narcan

Why Overdoses Happen

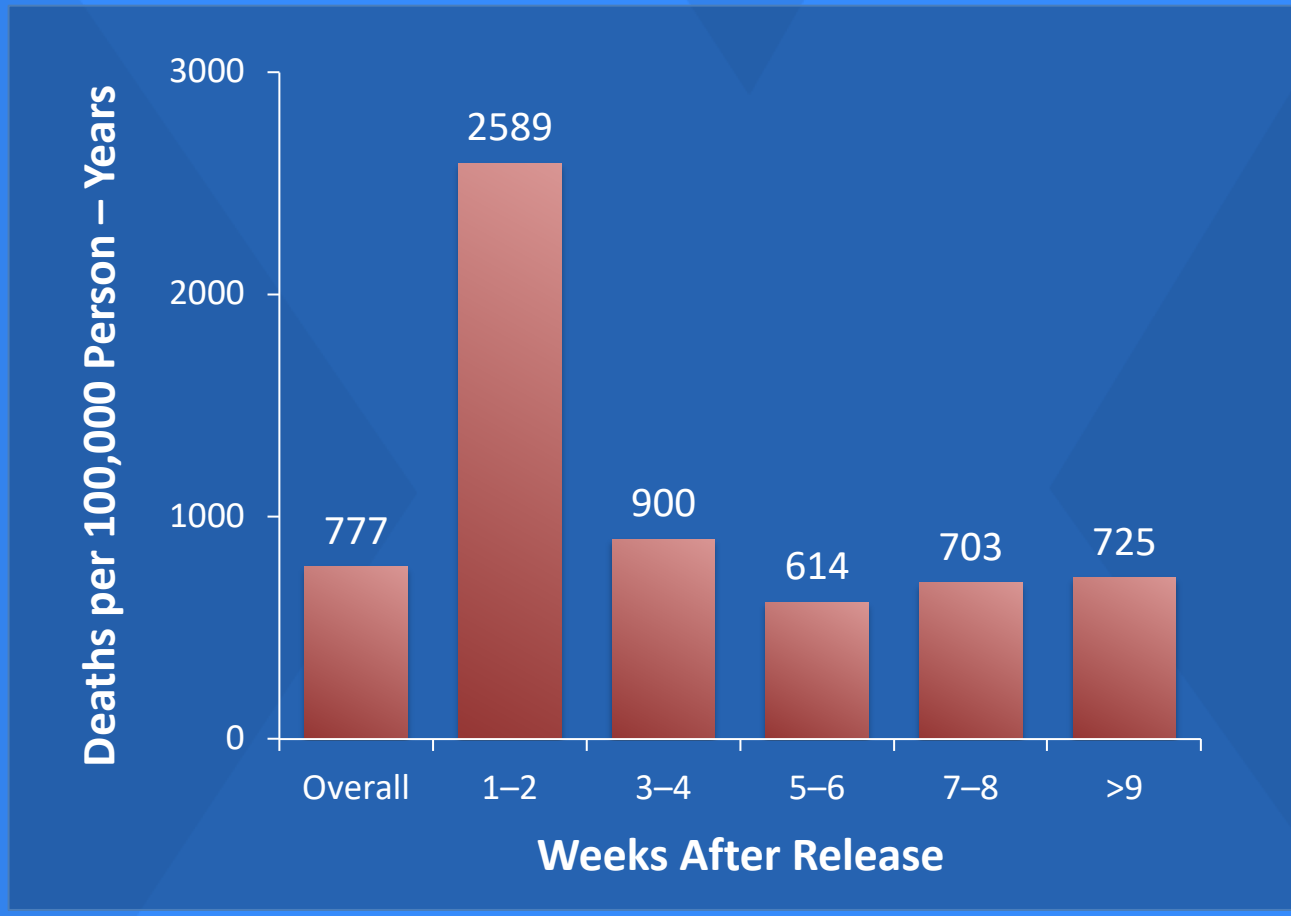
- Opioid overdose happens when a person takes so much opioid that there respiration slows and stops.
- Many don’t know the purity or exact content of a drug
- Many drug users don’t know the risks of mixing drugs and alcohol or Benzodiazepine
- Many overdose deaths happen because people who witness ODs don’t know how to respond

When Overdoses Happen

- May happen 1-3 hours after use or quicker when fentanyl is involved (as little as 5 to 10 minutes)
- After periods of abstinence/relapse (after treatment stay, hospitalization, incarceration)
- New city/residential location
- New dealer/source
- New route of administration
- Post incarceration

Reentry and Drug Overdose

In the first 2 weeks post-release, a former inmate's risk for death by drug overdose = **129** times the risk for the general population.



Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, Koepsell TD. *Release from prison-a high risk of death for former inmates.* N Engl J Med. 2007;356(2):157–165.

Top Overdose Risk Factors

- Using drugs alone – **use must be coordinated** – spaced out 10 minutes
- Misjudging body tolerance
- Poor physical health (advance liver damage, respiratory issues)
- Variation of substance
- Using an opioid with other depressants such as alcohol or benzodiazepines
- Cocaine is a stimulant but can contribute to overdose risk

What are Benzodiazepines?

- Class of prescription drugs that depress central nervous system and commonly used to treat anxiety and insomnia and alcohol detox
- Benzos are often misused, diverted or sold illegally
- Commonly used benzodiazepines are Xanax, Klonopin, Ativan, Valium, Librium
- Presents an extreme risk-factor for overdose when combined with any opioid

Signs of an Overdose

- **White/fair skin** – blue tint to the skin, eyelids and nail beds, deep bluing of the lips
- **Black/Brown skin** – grey tint to the skin, greying or deep purpling of the lips, vivid whitening of the nail beds
- Shallow breathing infrequent breathing or no breathing
- Shallow snoring, gurgling, labored breathing sounds – **DEATH RATTLE**
- Not responsive to loud sound or appropriate physical stimulation

Responding to an Overdose

Old Protocol

- Call 911
- Rescue breathing
- Administer Narcan
- Stay with the person until help arrives
- Recovery position as needed

New Protocol

- **ADMINISTER NARCAN FIRST THING**
- *Rescue breathing*
- *Call 911*
- Stay with the person until help arrives
- Recovery position as needed

Overdose: Most Critical Signs

1. Responsiveness to stimuli

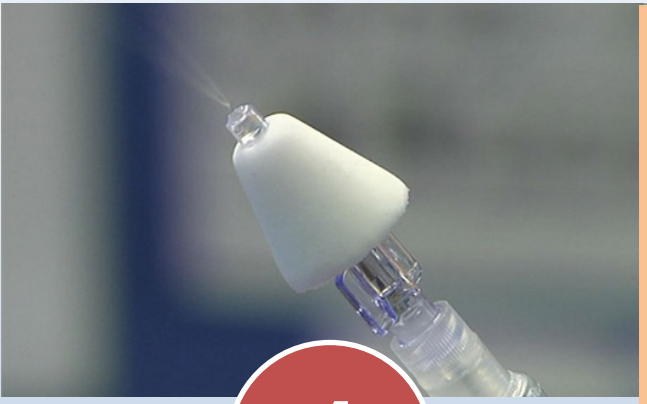
1. Breathing

1 Recognize overdose?

Steps to teach patients, family, friends, caregivers

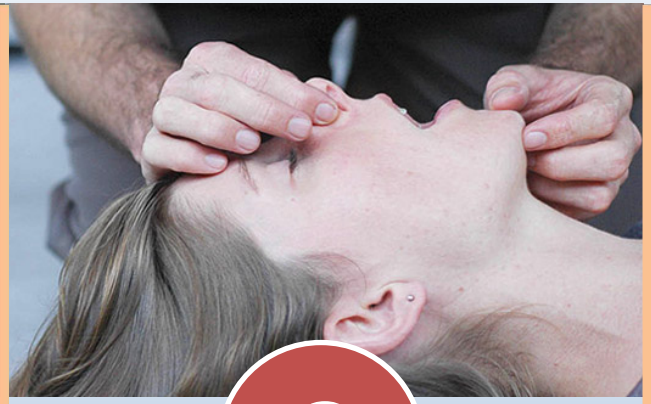
- If a person is not breathing or is struggling to breathe: call out name and rub knuckles of a closed fist over the sternum
- Look for signs of overdose
  - Slow or absent breathing
    - Gasping for breath or a snoring sound
  - Pinpoint pupils
  - Blue/gray lips and nails

When an Overdose Happens



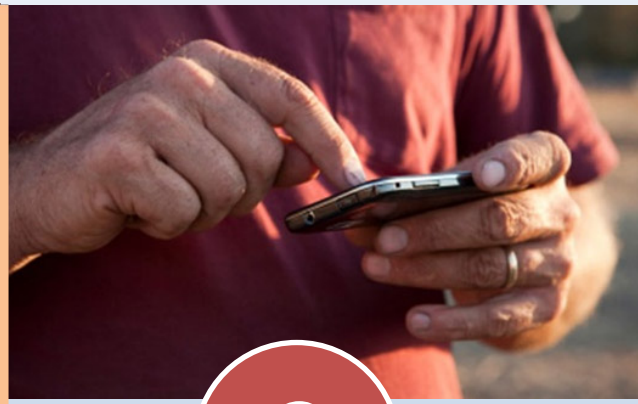
1

Administer naloxone



2

Rescue breathing



3

Call **911**

Rescue Breathing

Make sure there is nothing in the mouth

Tilt head back, lift chin, pinch nose

Watch to ensure the chest rises

Give a breath every *5 seconds* or do the best you can, no more than **90 seconds**.

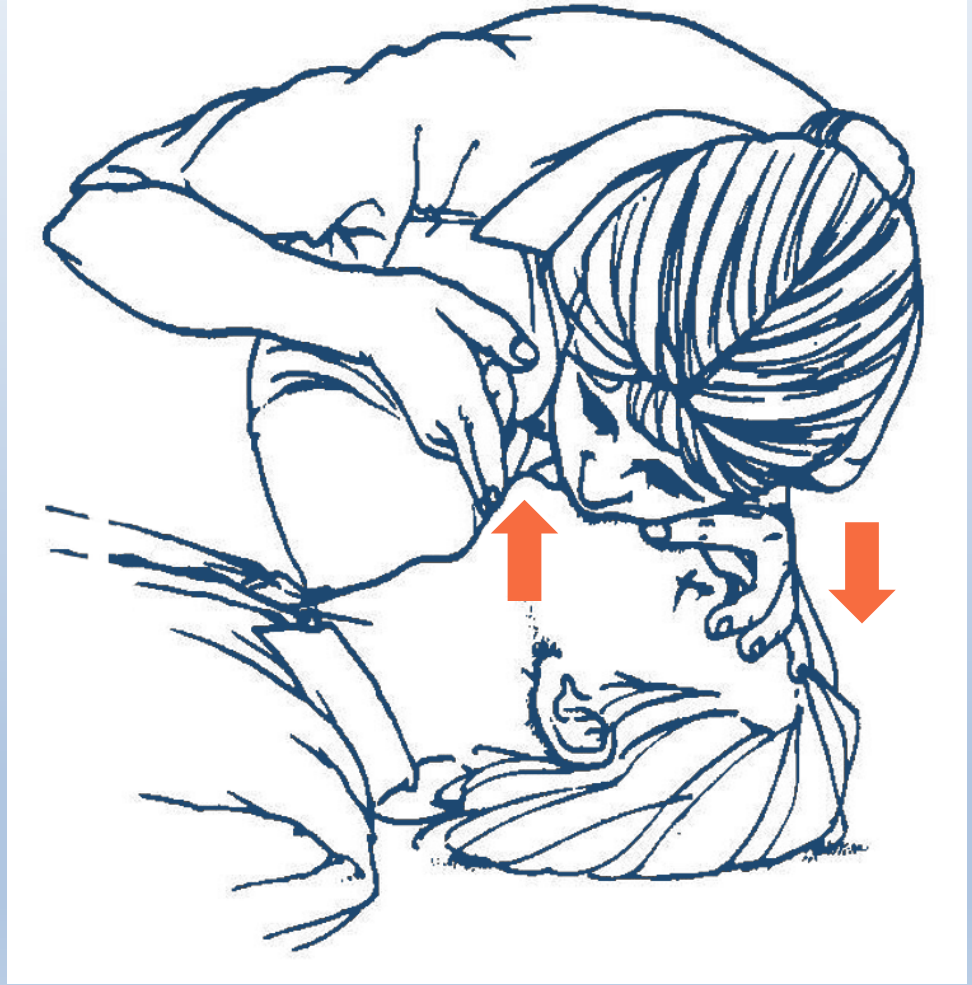
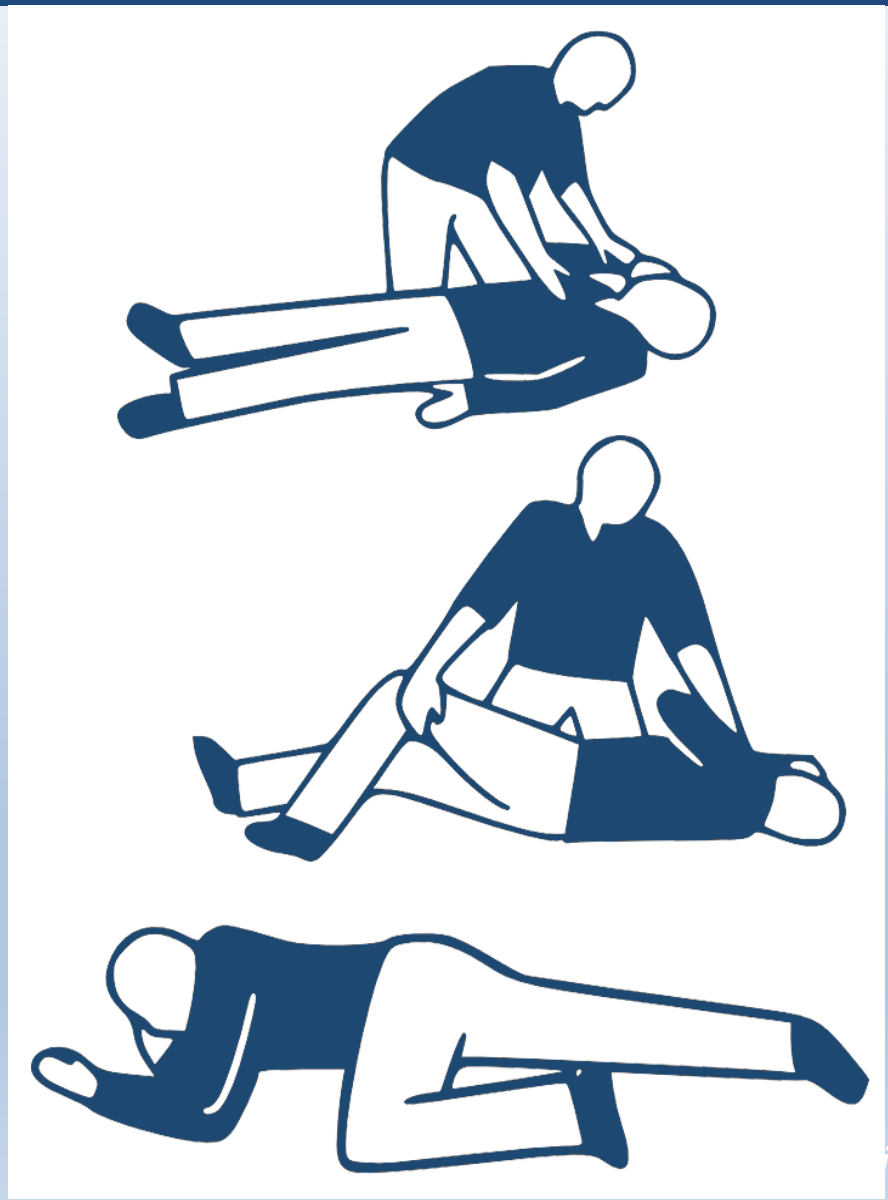


Illustration from the Harm Reduction Coalition

Recovery Position

If you must leave the person who is overdosing, put them into the recovery position so they won't choke on their own vomit



Naloxone

Naloxone (Narcan) will reverse the effects of opioids, reversing an overdose

- A prescription medicine that does nothing but reverse an opioid overdose
- Injectable and intranasal applications, simple nasal spray (most common formulation)
- Wakes a person who is overdosing in 3-5 minutes and lasts 30-90 minutes
- No effect other than blocking the opioids
- No adverse reactions
- No potential for abuse
- Cannot cause harm, even if the person is not overdosing but may cause withdrawal symptoms

Timing Is Everything:
The Duration of Naloxone & Opioids

Drug	Duration	Naloxone wears off in…
Methadone	24-32 hours	**30-90 mins**
Heroin	6-8 hours	**30-90 mins**
Oxycontin	3-6 hours	**30-90 mins**
Codeine	3-4 hours	**30-90 mins**
Demerol	2-4 hours	**30-90 mins**
Morphine	3-6 hours	**30-90 mins**
Fentanyl	2-4 hours	**30-90 mins**

Chart from OOD Prevention & Reversal Training Manual - BPHC

Responding to OD: **Action**

- **Administer Naloxone**
- Rescue breathing
- Call 911
- Recovery position
- Stay with the person

Naloxone Facts

- Reverses an overdose by blocking opioid receptors for 30-90 minutes
- After a maximum of 90 minutes any opioids in the body will return to the receptors
- Advise against using more opioids as overdose could occur again once the naloxone/narcan wears off

Naloxone Formulations

Nasal with separate atomizer
"Multi-step"

Amphastar Pharmaceuticals

Narcan Nasal Spray
"Single-Step"

Adapt Pharma

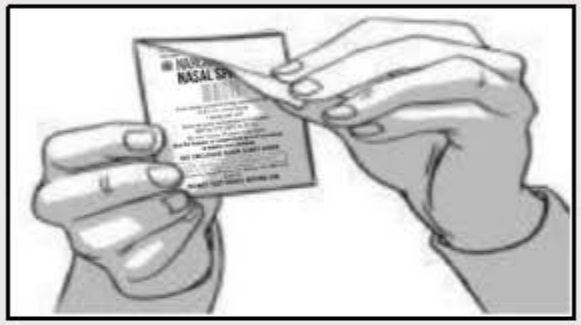
Auto-injector

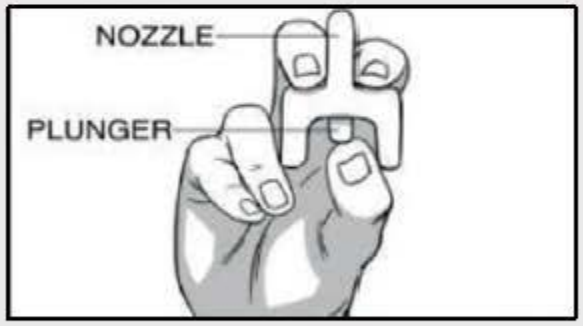
Kaleo Inc.

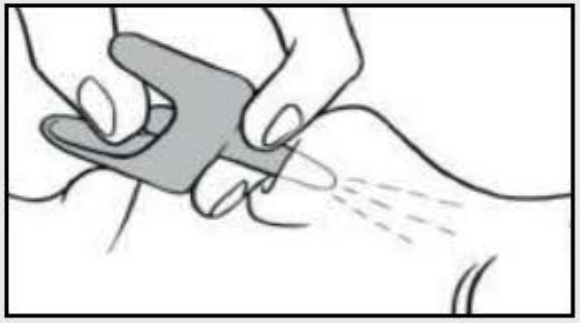
Intramuscular Injection

Various Companies

Single-Step Nasal Spray Administration







1 **PEEL** back the package to remove the device.

2 **PLACE** the tip of the nozzle in either nostril until your fingers touch the bottom of the patient's nose.

3 **PRESS** the plunger firmly to release the dose into the patient's nose.

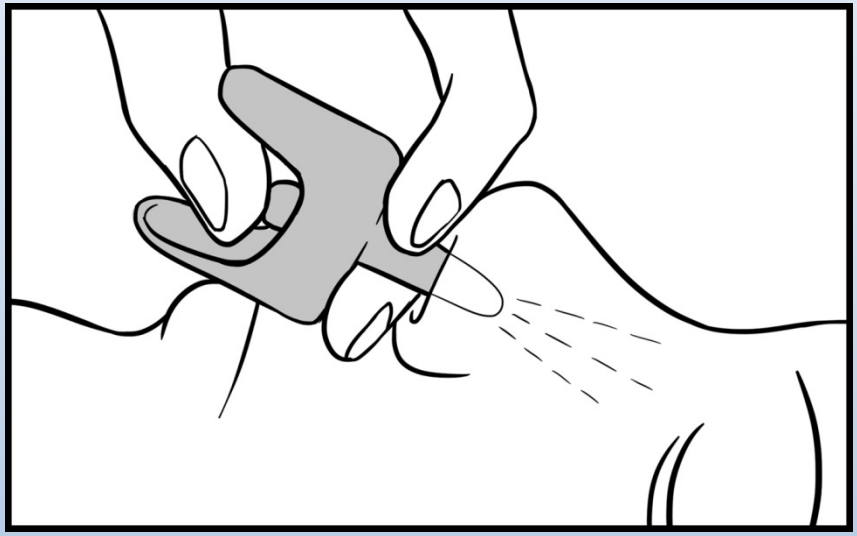
Naloxone Single Step Administration

Single-step:

- Comes with a pre-assembled applicator with Narcan built in
- Requires **no assembly**, just insert in nostril and push the button
- Delivers **4 milligrams dose via a spring-action button** that delivers a full dose in **one nostril**
- Delivered via nasal cavity with reports of delivery via anus when nasal was not an option

34 Administer Naloxone

Steps to teach patients, family, friends, caregivers



Naloxone from Pharmacies

1. Obtain a prescription from your prescriber and take it to a pharmacy that stocks naloxone

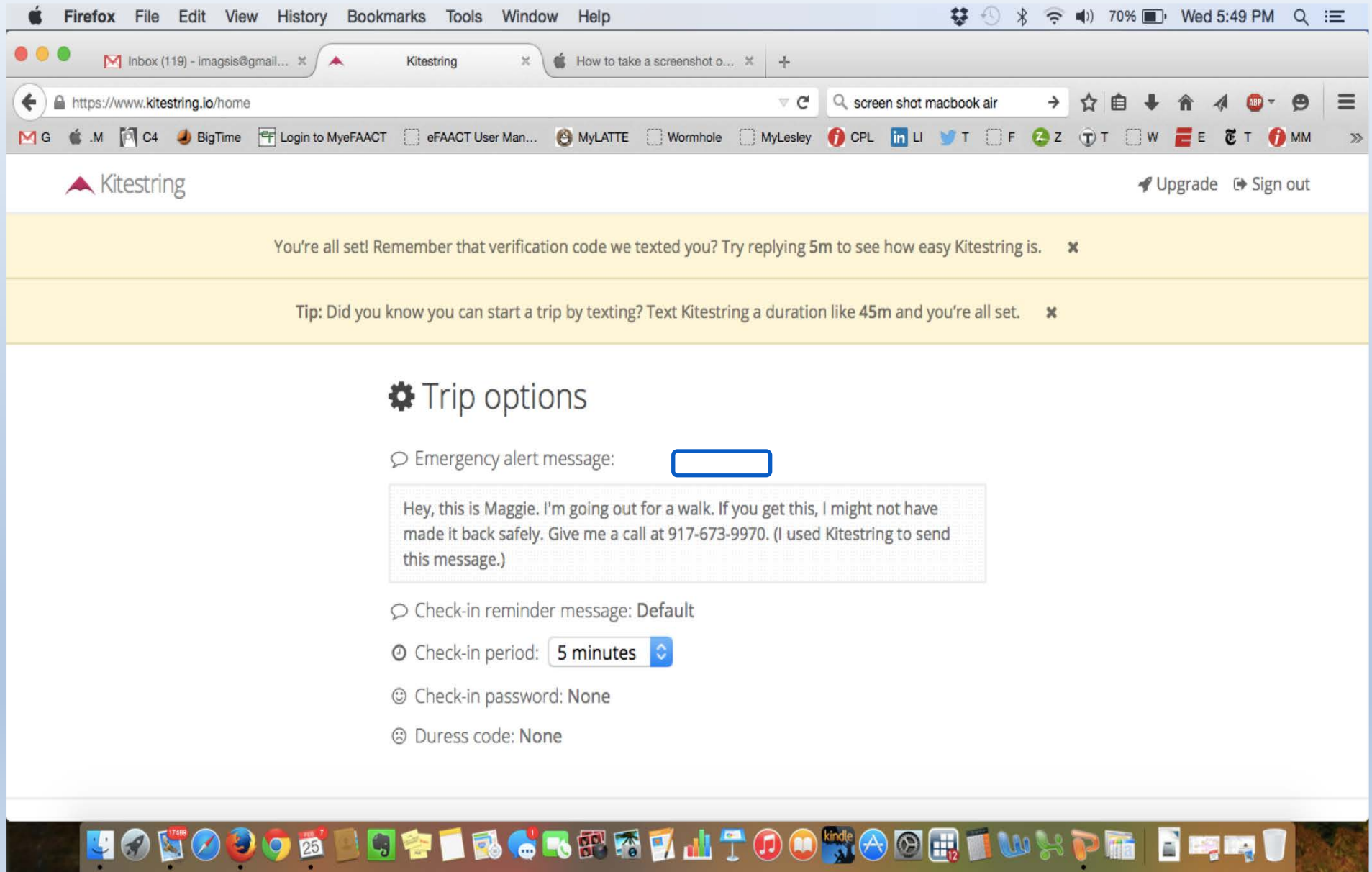
1. Go directly to a pharmacy with a naloxone standing order and request a naloxone kit at cost. Price ranges $41 to as much as $400 for the auto-injection model

*Most insurers cover naloxone including Mass Health

Myths: What NOT To Do

- DON’T leave the person alone
- DON’T leave the person without calling 911
- DON’T lock the door behind you
- DON’T put the person in a cold water bath or shower – they could drown!
- DON’T inject them with salt water, milk, or other drugs (like cocaine or speed)
- DON’T put ice on their genitals, Ice won’t help.
- Neither will tea, coffee, or alcohol.
- DON’T make them vomit – they could choke!

www.Kitestring.io



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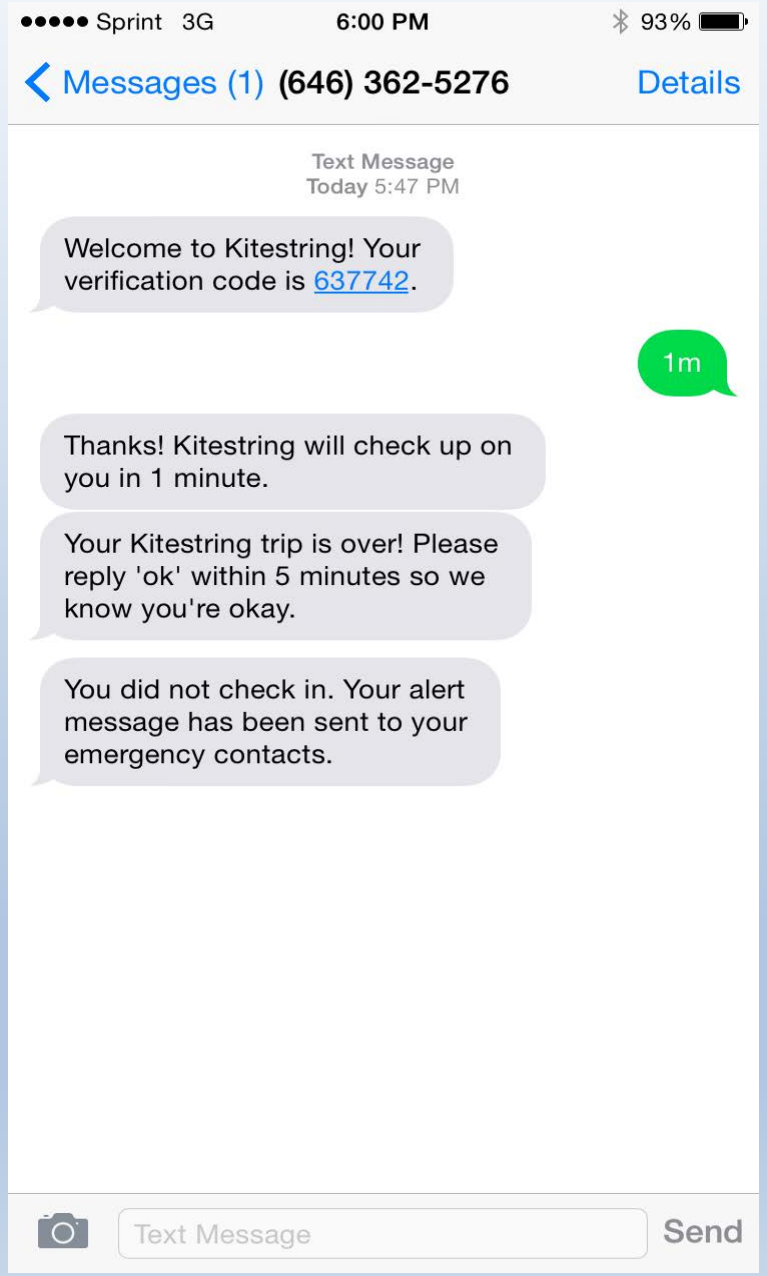

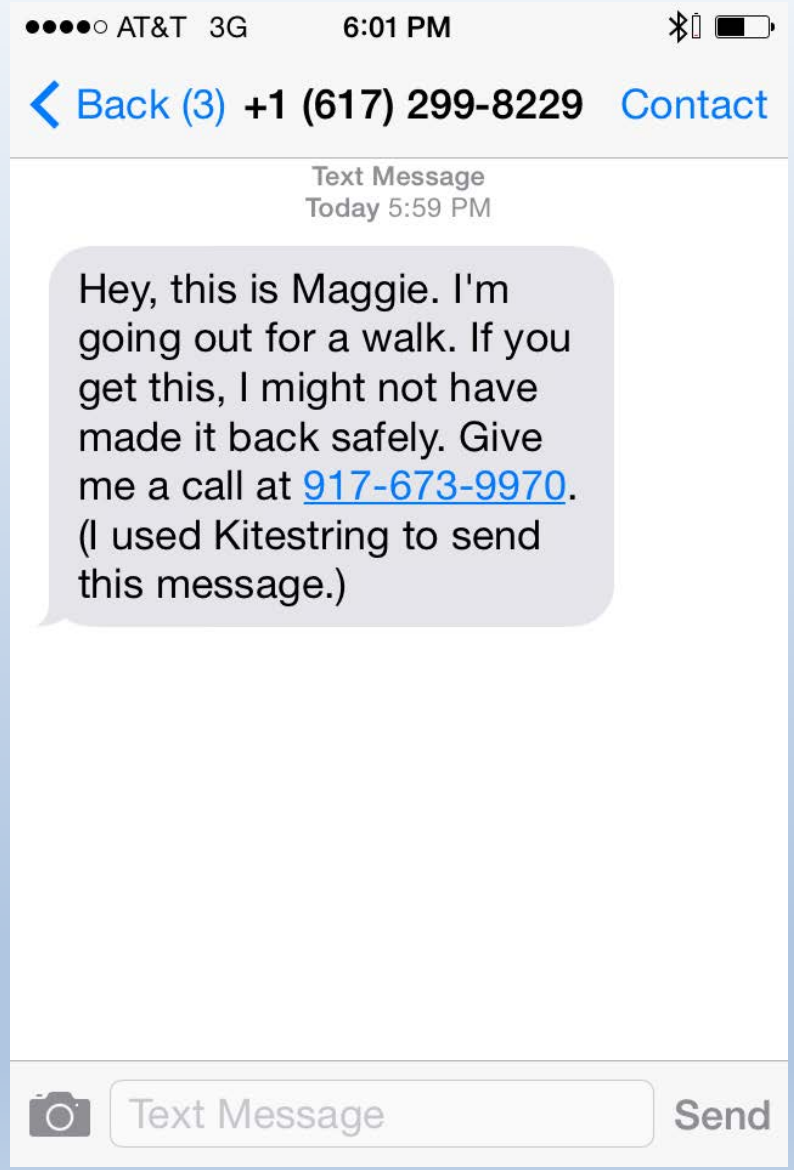

Massachusetts Responds

- Expanding first-in-the-nation core competencies for safe prescribing of opioids to community health centers, advanced nursing, physician assistance and dental schools.
- Successfully launching MassPAT, the new online prescription awareness and monitoring tool.
- Approving of new standing orders that allow EMS providers to administer a higher dose of naloxone to counteract overdoses. The change is in response to the need for stronger, multiple doses required for overdoses caused by fentanyl, which is far more potent than heroin.
- Adding 75 treatment beds in Taunton and Western Mass.
- Releasing of an unprecedented report using advanced data to further understand the underlying causes of opioid-related deaths.

Wrap Up

- Fentanyl is showing up more and more nationally and within Massachusetts
- Fentanyl is causing more overdoses and bringing them on quicker
- The presence of fentanyl may require the administration of more Narcan than was previously required
- Much of the state is moving to the single-step narcan kits
- Single-step Narcan kits deliver 4ml (twice as much as single-step) and has a spring trigger that delivers entire contents in one nostril

Thank you

Center for Social Innovation

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