Massachusetts Department of Public Health

EXAMINING THE OPIOID EPIDEMIC USING LINKED DATA IN MASSACHUSETTS

NASEM Forum on Mental Health and Substance Use Disorders

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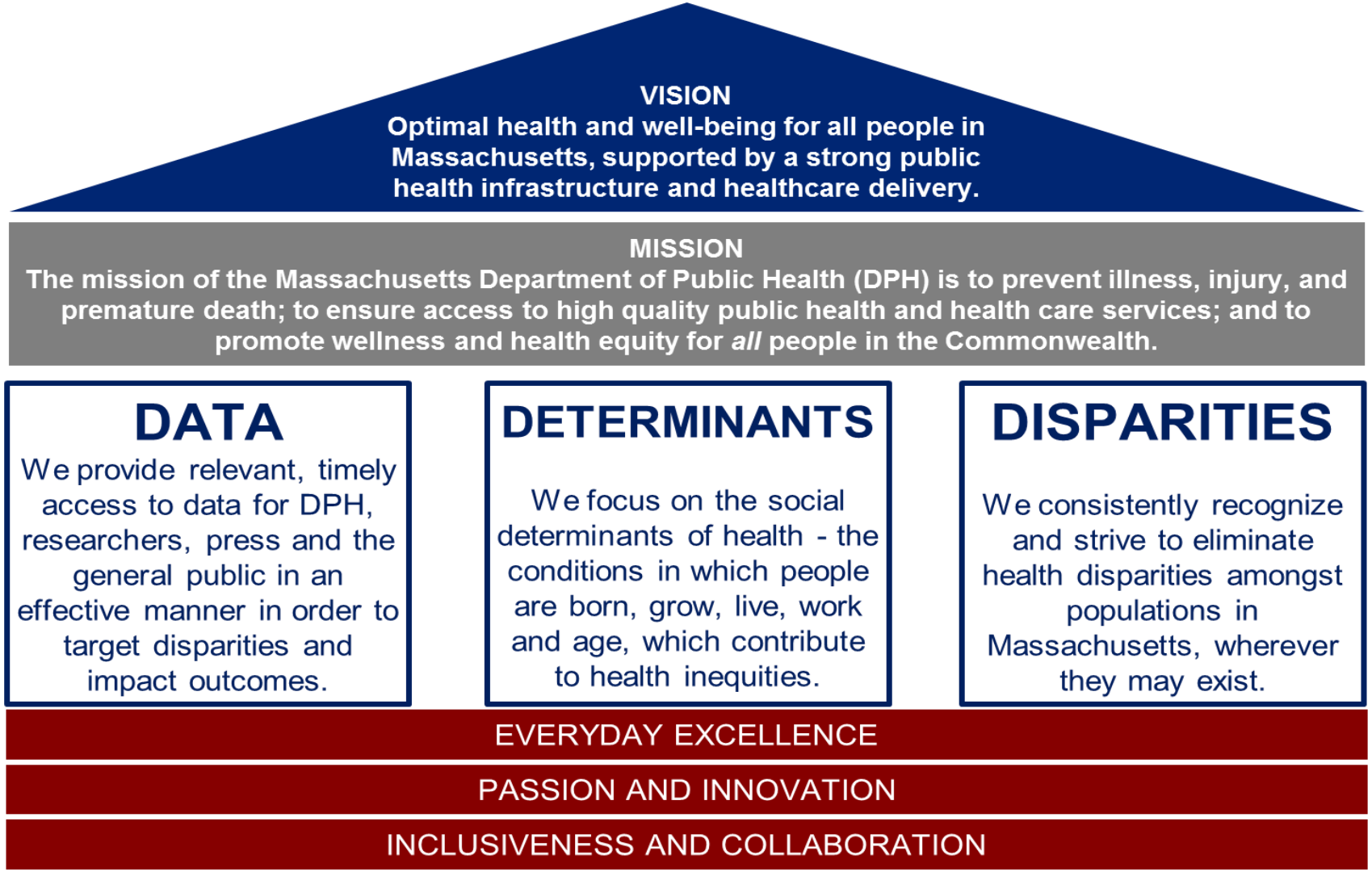
Disclosures

- I have no financial or non financial conflicts of interest to disclose

Disclosures

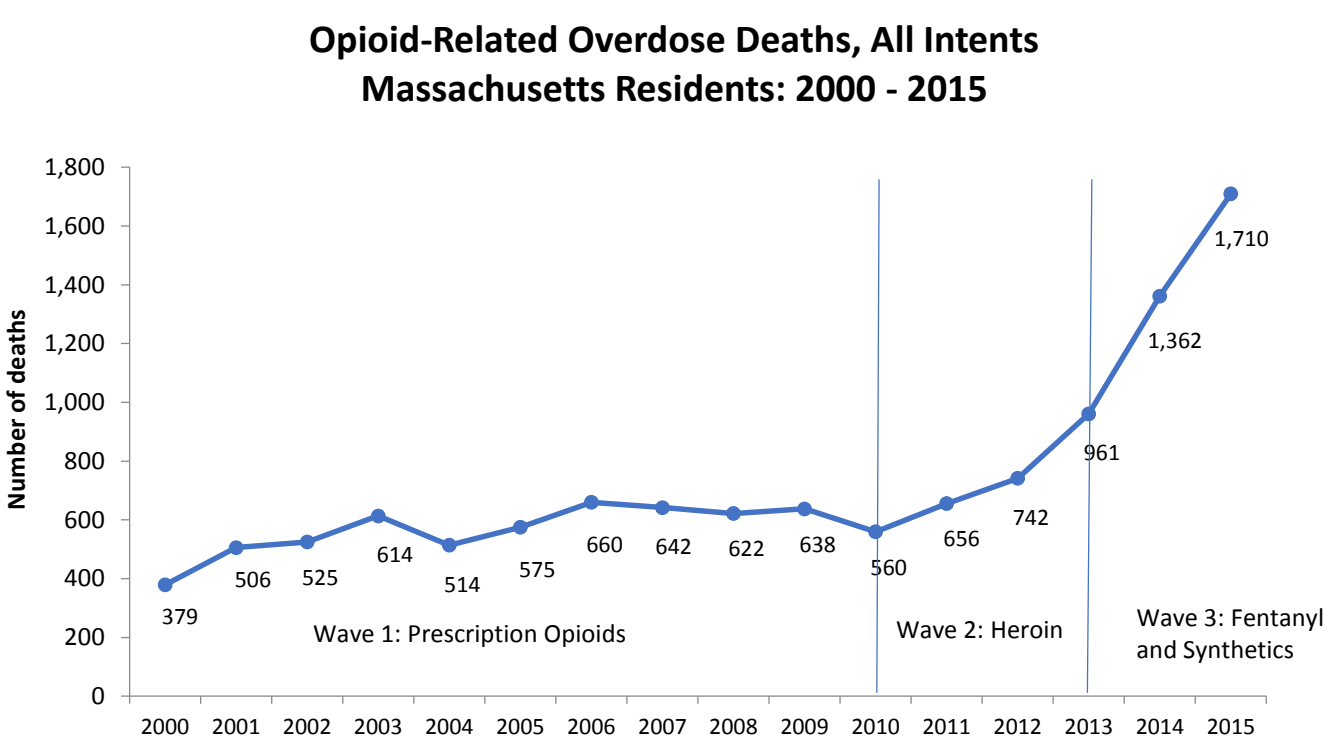
- Background and context
- Implementation challenge
- Project highlights
- Implementation success / key lessons learned
- Analytics and data to actions

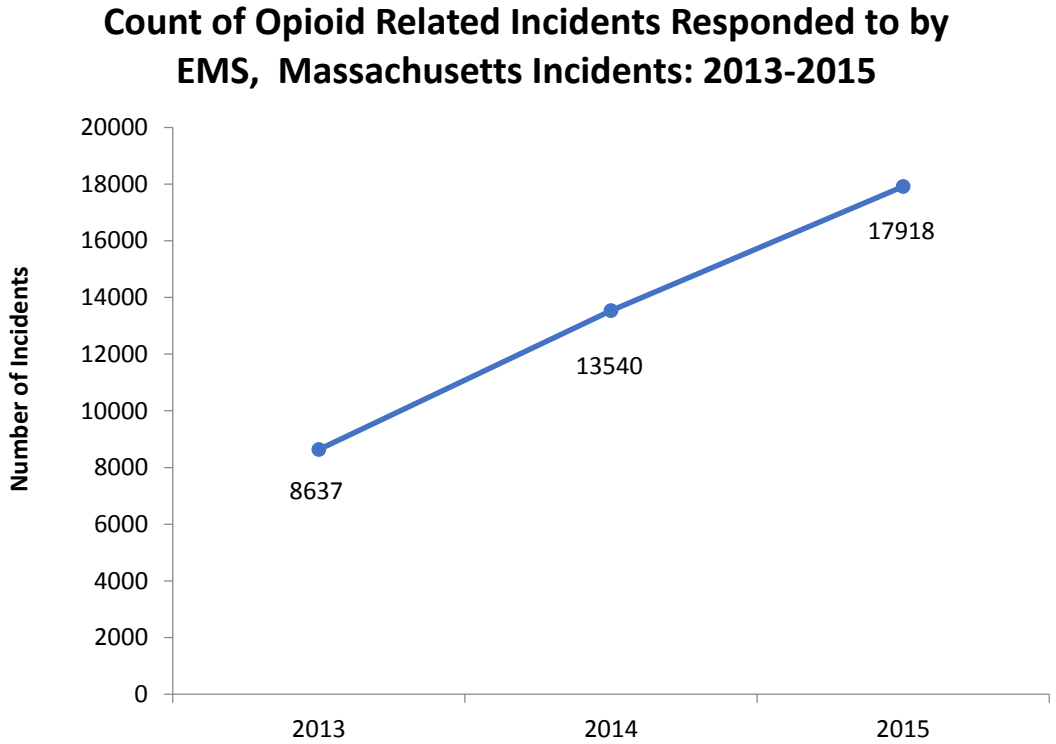
Background and Context: The DPH House



Background and Context

The Opioid Crisis in Massachusetts





Background and Context: State of DPH Data in January 2015

- 300+ data mostly unlinked systems
- Access to data guided by “manual” IRB/24A process
- No audit of actual usage
- No direct public access to data
- Little ability to answer complex public health questions

Background and Context: Chapter 55 Legislation

- Originally signed into law by Governor Charlie Baker in August 2015 and re-authorized in 2016
- Provides the legal basis for cross-agency collaboration to study the alarming trends in opioid-related overdoses. Overcomes legal barriers for use of some data
- Specifies some contributing data partners
- Originally required DPH to examine data related to opioid overdose deaths and to submit report addressing 7 specific questions
- DPH determined that questions could not be answered without linking the data sources

Implementation Challenge

Differing Legal Requirements	Data Considerations	Information Technology Architecture
• HIPAA • 42 CFR Part 2 • Medicaid rules • State laws not addressed by Chapter 55	• Inconsistent structures among source datasets • Variable quality of documentation • Volume of data • Need to turn raw data into analytic files • Missing data	• How to link, secure, store, and access the data • How to securely store data pursuant to industry standards like NIST 800-53

Identifying a compliant solution which solves across these domains

Implementation Challenge

Beyond the Mandate – From What to How

- **Data Use Agreements:** went above and beyond legal requirements to protect the data
- **Linkage Process/Split Files:** Identifiers and analytic data never stored with the same ID
- **Data Security:** Data delivered by hand on encrypted drives and encrypted in use and at rest
- **Analytic Environment:**
  - Analysts cannot see the data
  - Linkage done on the fly and temporary work files are deleted at end of session
  - No write access
  - Full auditability of all data operations

Project Highlights: Timeline and Analyses

- **Timeline:** August 2015 - June 2017

- **Analyses:**
  - Phase 1: Looked at fatal opioid-related overdoses
    - DPH Answered 7 questions posed by legislature
    - DPH (with some help) conducted 4 additional analyses to highlight the importance of using linked data to understand the epidemic
  - Phase 2:Expanded to included nonfatal opioid-related overdoses
    - DPH conducted several analyses
    - DPH approved over 20 projects with external collaborators

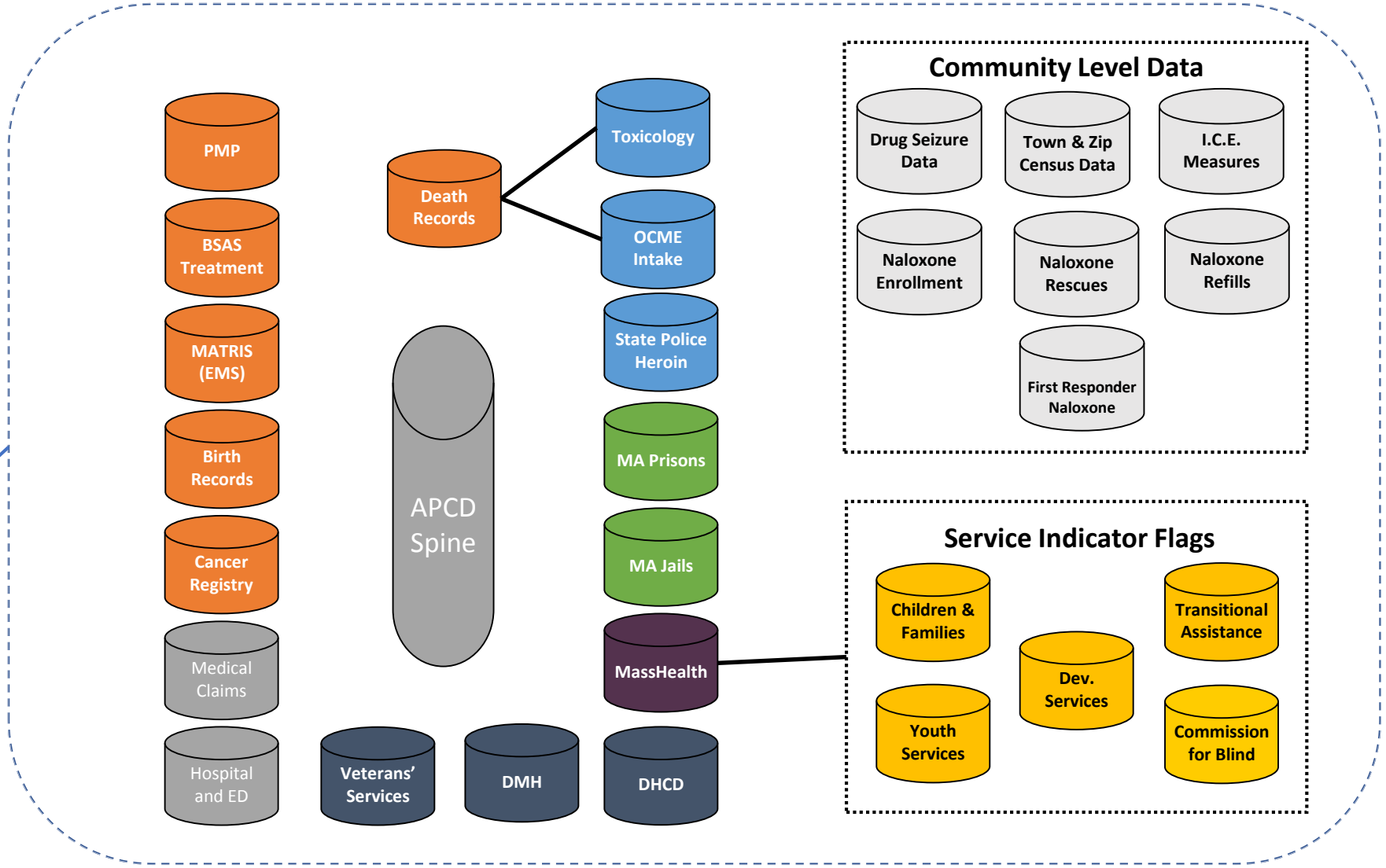
Project Highlights: Data Structure/Analytic Environment

Data Sources

- Public Health
- Medical Claims & Hospital
- MassHealth (Medicaid)
- Other State Agencies
- Public Safety
- Criminal Justice
- Service Flags
- Aggregate

Analytic Environment

- SAS datasets
- Secure, remote server
- Analysis via SAS Studio



Project Highlights: Public Health Data Warehouse (PHD)

- After a successful proof of concept under Chapter 55, the Public Health Data Warehouse (PHD) was authorized in 2017 under **M.G.L. c. 111, §237**

- *The commissioner shall collect, record and analyze data, and shall assemble and maintain data systems, necessary to analyze **population health trends**. The commissioner shall give priority to analyzing fatal and nonfatal opiate overdoses. The commissioner may identify and determine additional priorities for the **reduction of morbidity and mortality**.*

PHD – Next Steps

- Re-building the warehouse under the new Section 237 authority

- Identifying public health priorities
  - Continued focus on fatal and nonfatal opioid overdose (per statutory authority) with a focus on the Social Determinants of Health (SDoH)
  - Inequities in maternal & child health with an initial focus on maternal morbidity and mortality
  - Priority populations: people of color, people experiencing homelessness/housing instability, pregnant and post-partum women, incarceration and criminal justice-involved individuals, people with co-occurring disorders

- Targeting 10 new datasets to include in PHD

Project Highlights: PHD – Proposed Data Structure

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Analytic Environment

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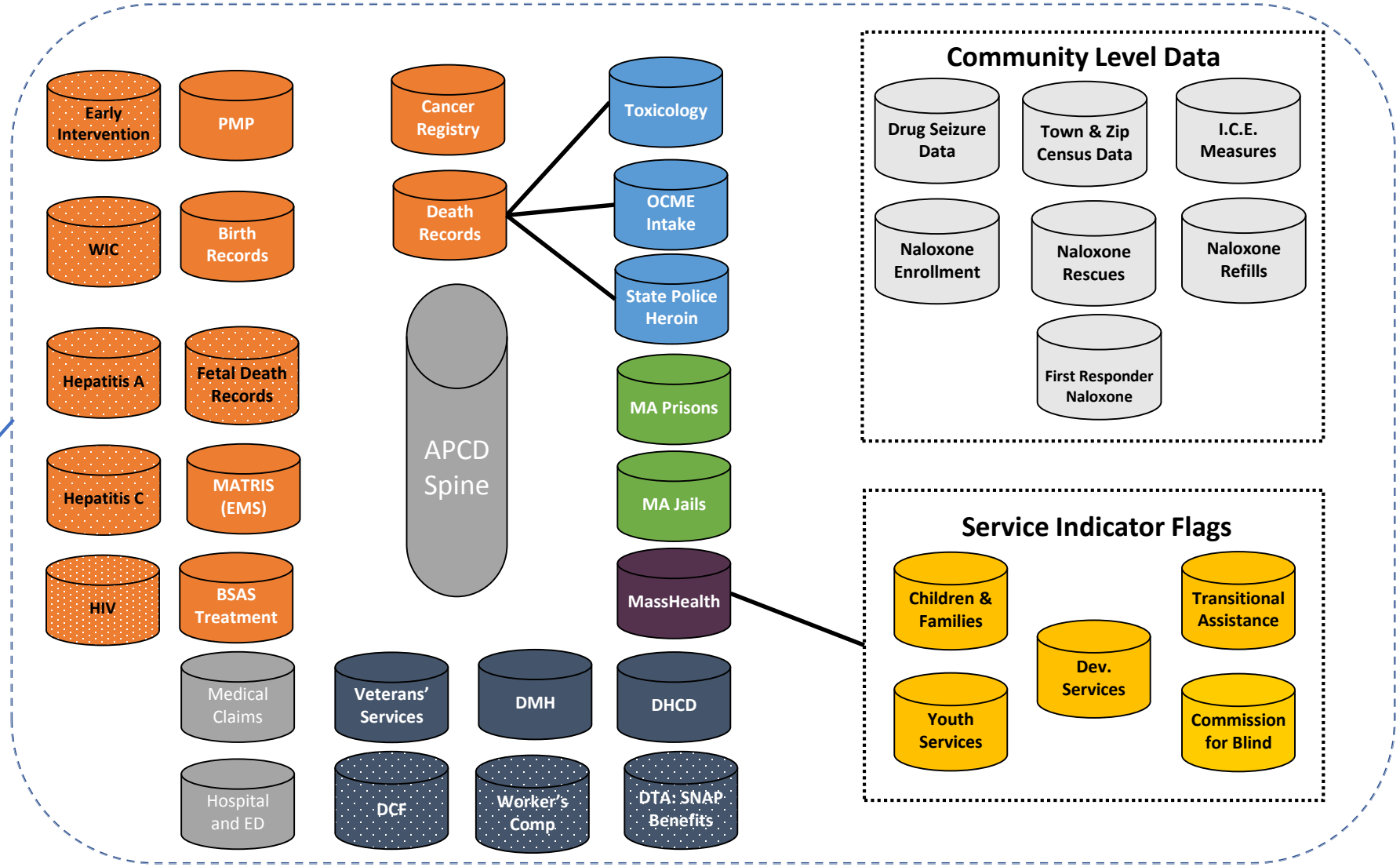


Implementation Success

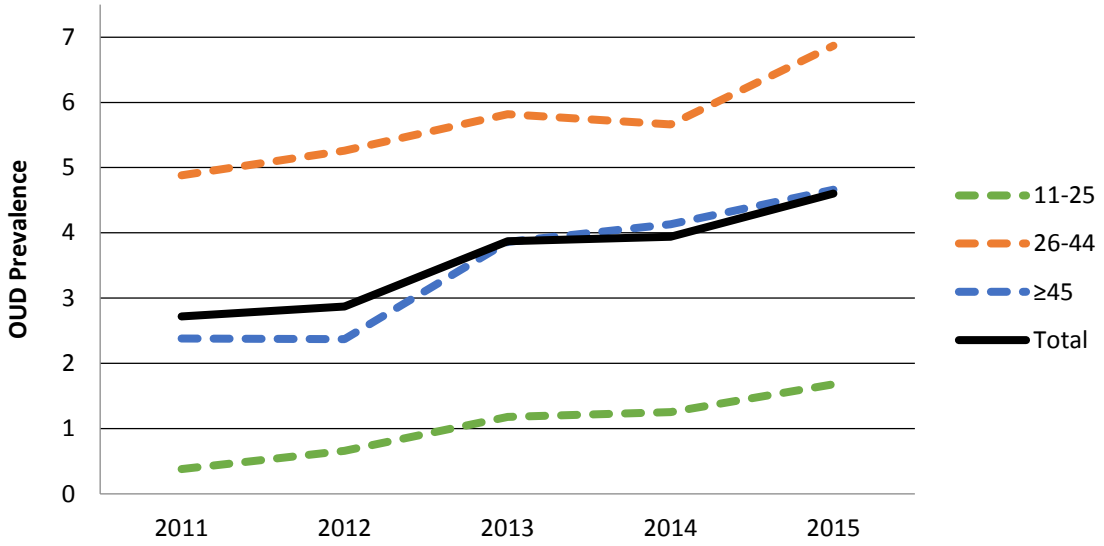
- Assembled 17 datasets, including data from 22 different sources
- Data provided by 9 different state agencies
- Participation and assistance from over **40** academic, hospital/private industry, and state/federal agency partners, in Massachusetts and nationally

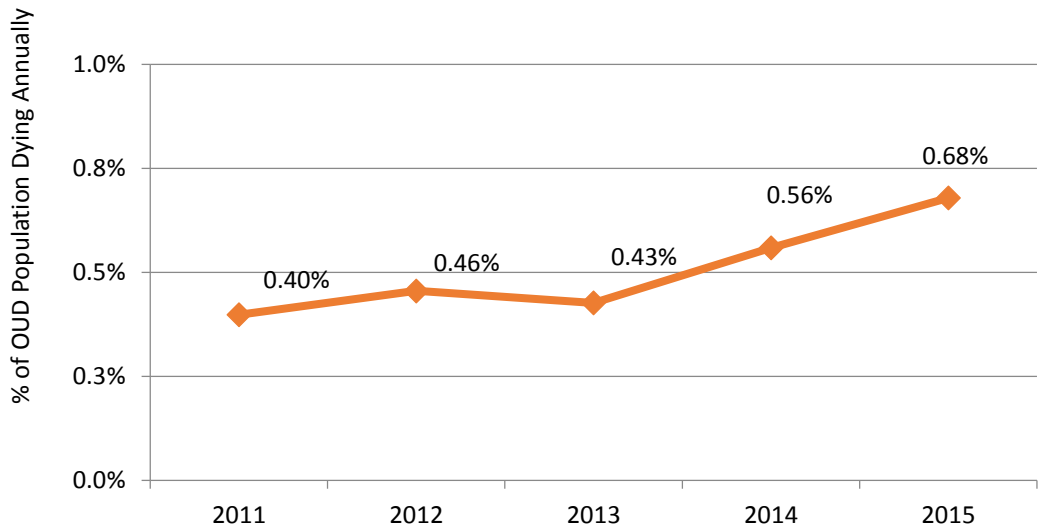
Key Lessons Learned

- Clearly-defined vision for the work
- Strong, dedicated leadership
- Multidisciplinary team & strong relationships
- Foundation already in place
- Solution-focused orientation

Analytics and Data to Action

- **Key Findings:** In Massachusetts, the OUD prevalence was 4.6% among people 11 years or older in 2015. The number of individuals with OUD is likely increasing, particularly among young people. The proportion of the OUD population dying from opioid-related overdoses nearly doubled between 2011 and 2015.



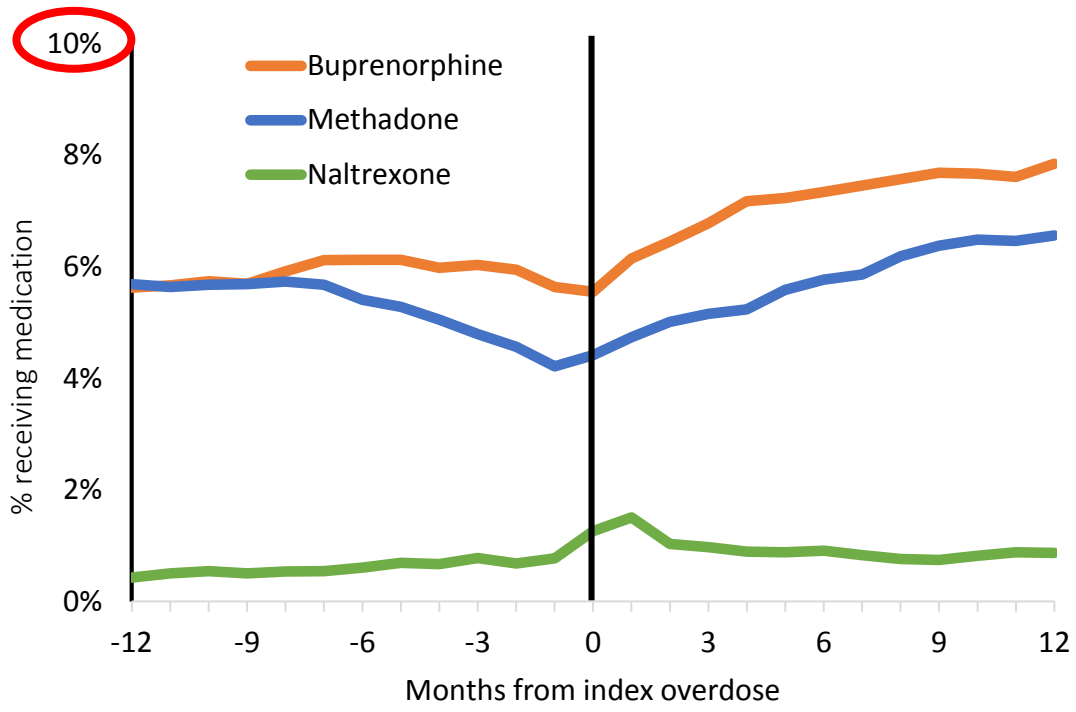


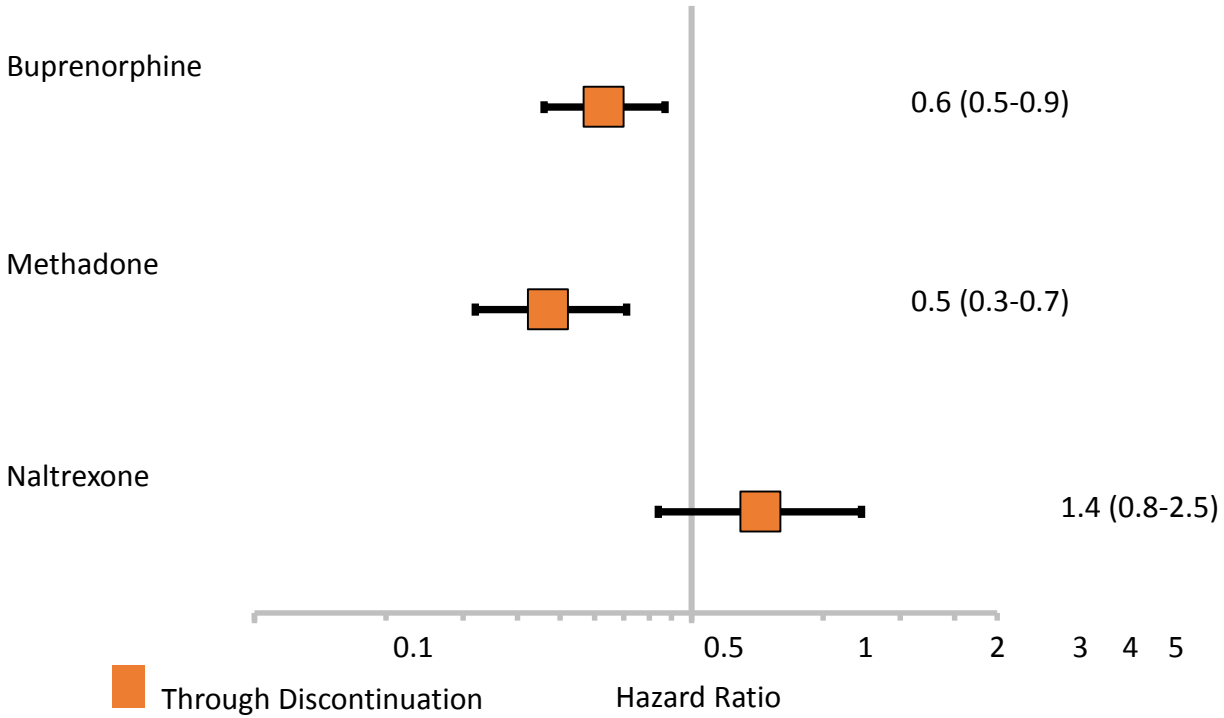
- **Action:** Understanding the size of the population at risk for opioid-related harms helps us allocate resources and appropriately plan and implement prevention, treatment, and recovery services

Citation: Barocas JA, White LF, Wang J, Walley AY, LaRochelle MR, Bernson D, Land T, Morgan JR, Samet JH, Linas BP. Estimated Prevalence of Opioid Use Disorder in Massachusetts, 2011-2015: A Capture-Recapture Analysis. Am J Public Health. 2018 Dec;108(12):1675-1681.

Analytics and Data to Action

- **Key Finding:** few individuals received medication for opioid use disorder after a nonfatal overdose. However, those that did had a significant reduction in mortality



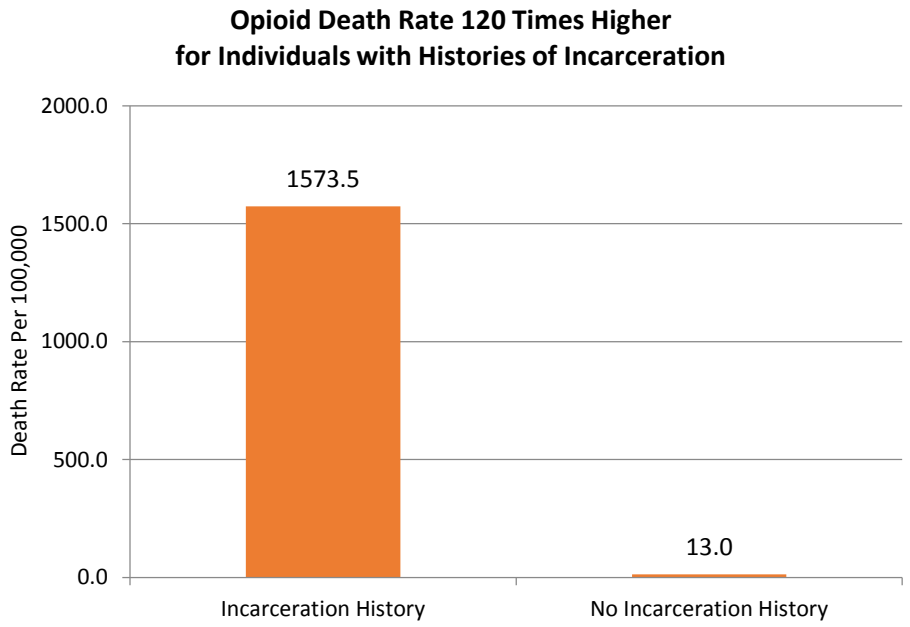


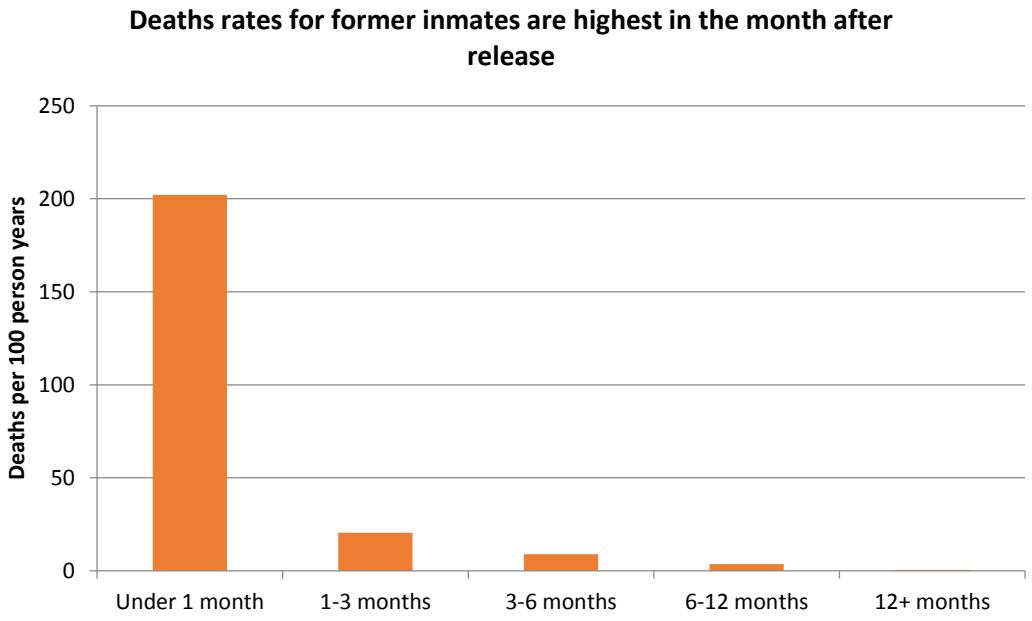
- **Action:** Funding for clinicians to provide such treatment; changes to medical school curriculum; commission to study impact and outcomes of Medication Assisted Treatment

Citation: Larochelle MR, Bernson D, Land T, Stopka TJ, Wang N, Xuan Z, Bagley SM, Liebschutz JM, Walley AY. Medication for Opioid Use Disorder After Nonfatal Opioid Overdose and Association With Mortality: A Cohort Study. Ann Intern Med. 2018 Aug 7;169(3):137-145.

Analytics and Data to Action

- **Key Finding:** individuals with a history of incarceration are at very high risk of opioid related overdose death

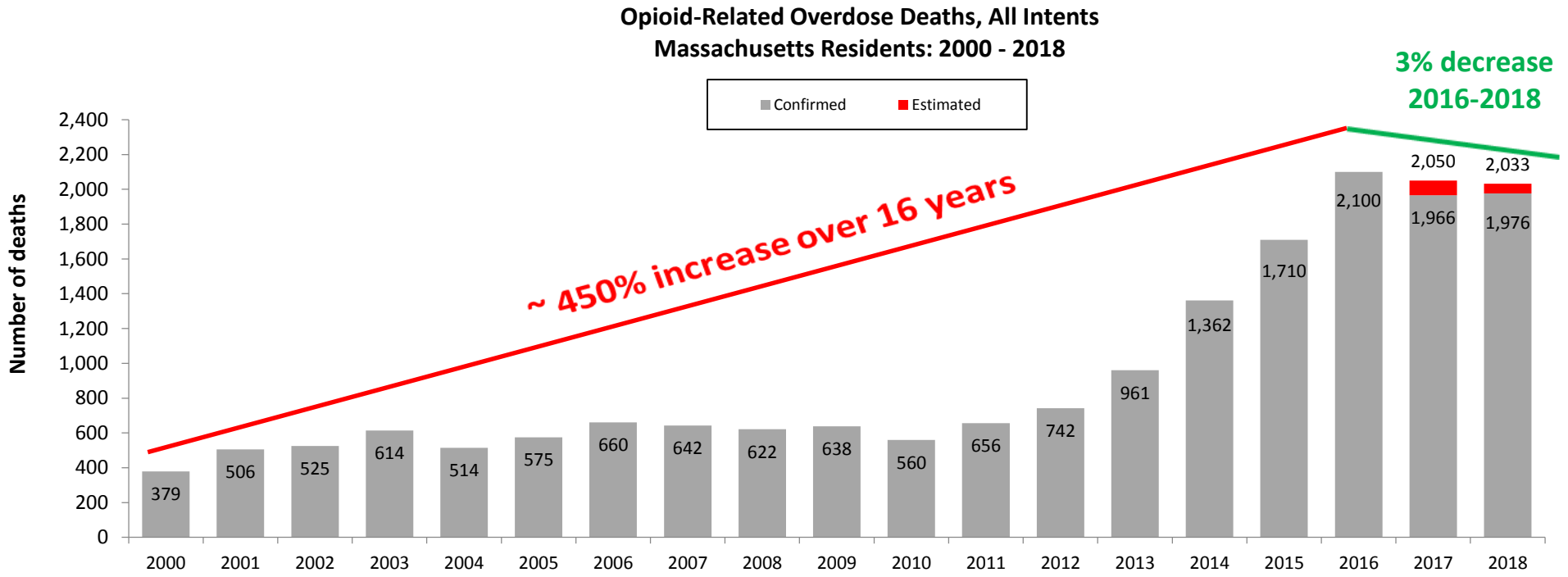




- **Action:** Recent legislation allows collaboration with corrections on treatment with medications for opioid use disorder for inmates before release;

Citation: An Assessment of Fatal and Nonfatal Opioid Overdoses in Massachusetts (2011 – 2015). Boston, MA; 2017. https://www.mass.gov/files/documents/2017/08/31/legislative-report-chapter-55-aug-2017.pdf.

Analytics and Data to Action



150 YEARS OF ADVANCING PUBLIC HEALTH

Thank You!

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