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

VISION
Optimal health and well-being for all people in Massachusetts, supported by a strong public health infrastructure and healthcare delivery.

MISSION
The mission of the Massachusetts Department of Public Health (DPH) is to prevent illness, injury, and premature death; to ensure access to high quality public health and health care services; and to promote wellness and health equity for all people in the Commonwealth.

DATA
We provide relevant, timely access to data for DPH, researchers, press and the general public in an effective manner in order to target disparities and impact outcomes.

DETERMINANTS
We focus on the social determinants of health - the conditions in which people are born, grow, live, work and age, which contribute to health inequities.

DISPARITIES
We consistently recognize and strive to eliminate health disparities amongst populations in Massachusetts, wherever they may exist.

EVERYDAY EXCELLENCE
PASSION AND INNOVATION
INCLUSIVENESS AND COLLABORATION
Background and Context

The Opioid Crisis in Massachusetts

Opioid-Related Overdose Deaths, All Intents
Massachusetts Residents: 2000 - 2015

Count of Opioid Related Incidents Responded to by EMS, Massachusetts Incidents: 2013-2015
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

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

Data Structure/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.
• 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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Community Level Data
- Drug Seizure Data
- Town & Zip Census Data
- I.C.E. Measures
- Naloxone Enrollment
- Naloxone Rescues
- Naloxone Refills

Service Indicator Flags
- Children & Families
- Transitional Assistance
- Youth Services
- Dev. Services
- Commission for Blind

Data Sources
- Early Intervention
- PMP
- Cancer Registry
- Toxicology
- Birth Records
- Death Records
- OCME Intake
- MATRIS (EMS)
- State Police Heroin
- Fetal Death Records
- MA Prisons
- BSAS Treatment
- MA Jails
- Hospital and ED
- MassHealth
- Medical Claims
- DTF: SNAP Benefits
- Veterans' Services
- DHCD
- DMH
- Worker's Comp
- OCF
- Hospital and ED
- OCF
- Hospital and ED
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
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.

**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.

Analytics and Data to Action

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

![](attachment:image1.png)

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

### Opioid-Related Overdose Deaths, All Intents
Massachusetts Residents: 2000 - 2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Confirmed</th>
<th>Estimated</th>
<th>Change</th>
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<tbody>
<tr>
<td>2000</td>
<td>379</td>
<td>379</td>
<td>~ 3%</td>
</tr>
<tr>
<td>2016</td>
<td>1,710</td>
<td>1,966</td>
<td>3%</td>
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</tbody>
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- ~ 450% increase over 16 years
- 3% decrease 2016-2018
Thank You!

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