The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
250 Washington Street, Boston, MA 02108-4619

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lieutenant Governor

MARYLOU SUDDERS
Secretary

MONICA BHAREL, MD, MPH
Commissioner

Tel: 617-624-6000
www.mass.gov/dph

July 1, 2016

Steven T. James
House Clerk
State House Room 145
Boston, MA 02133

William F. Welch
Senate Clerk
State House Room 335
Boston, MA 02133

Dear Mr. Clerk,

Enclosed, please find a status report on the opioid overdose study authorized by Chapter 55 of the Acts of 2015 for your review and consideration.

The current opioid epidemic affecting our Commonwealth's communities has taken a record number of lives in each of the last four years. Opioid Use Disorder is a complex chronic disease, and the opioid epidemic is a complex and persistent problem that will not be solved through a single solution. Due to the severity of this epidemic and the significance of our preliminary findings, we found it important to issue this status report in advance of our forthcoming full report. Analytic work is ongoing, and much is yet to be learned from this effort, however, what we have learned thus far has prompted us to issue this status report to immediately inform our collective work with new insight into overdose-related deaths and the relative risks faced by different populations.

I would like to acknowledge that this work has required a significant collaborative effort from many government agencies. To this end, we are truly grateful to the many partners which have assisted DPH in this work so far. This effort highlights government's ability to work

collaboratively towards efficiently solving complex and urgent problems. With the effort of legal, technical, and analytical teams across seven agencies (Department of Public Health, EOHHS IT, the Office of the Chief Medical Examiner, the Department of Correction, MassHealth, the Center for Health Information and Analysis, and MassIT), Massachusetts has been able to develop a novel data model that allows for simultaneous analysis of 10 datasets with information relevant to opioid deaths. The goodwill of all parties has been a hallmark of this ongoing work.

I would also like to express my appreciation for the opportunity this legislation has provided the Department of Public Health. The ability to look as broadly and as deeply at public health data has been a unique challenge, but one that has given us a much greater understanding of the current opioid epidemic. The analytic approach authorized by Chapter 55 has enabled Massachusetts to serve as a national example for the possibilities of public health's ability to leverage data warehousing to respond to pressing policy and health concerns by allowing existing data to be used in new and innovative ways to support policy and decision making, and to allocate resources more efficiently and effectively. To this end, other states have already engaged the Department in discussions about the technical aspects of this project, and I hope that this will serve as a model for how complex problems can be tackled in the future.

Let me once again express my appreciation for this opportunity to better understand the root causes of the opioid epidemic. I look forward to sharing the results of our full report with you shortly.

Sincerely,

Monica Bharel, MD, MPH
Commissioner
Department of Public Health

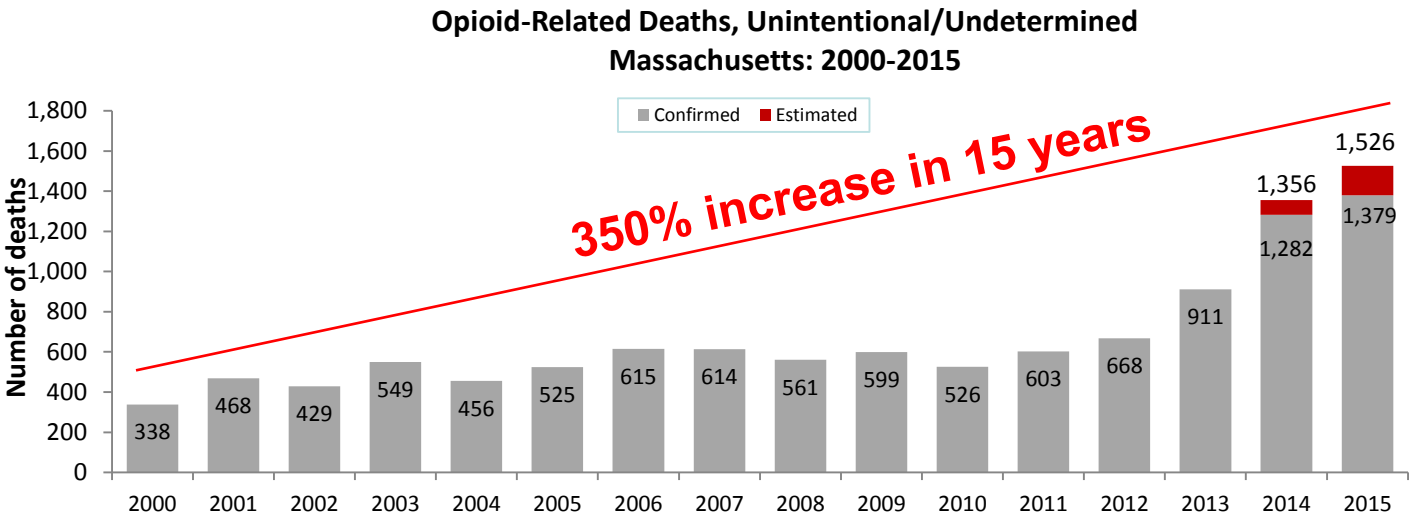
Assessment of Massachusetts Opioid-Related Deaths: *Preliminary Findings*

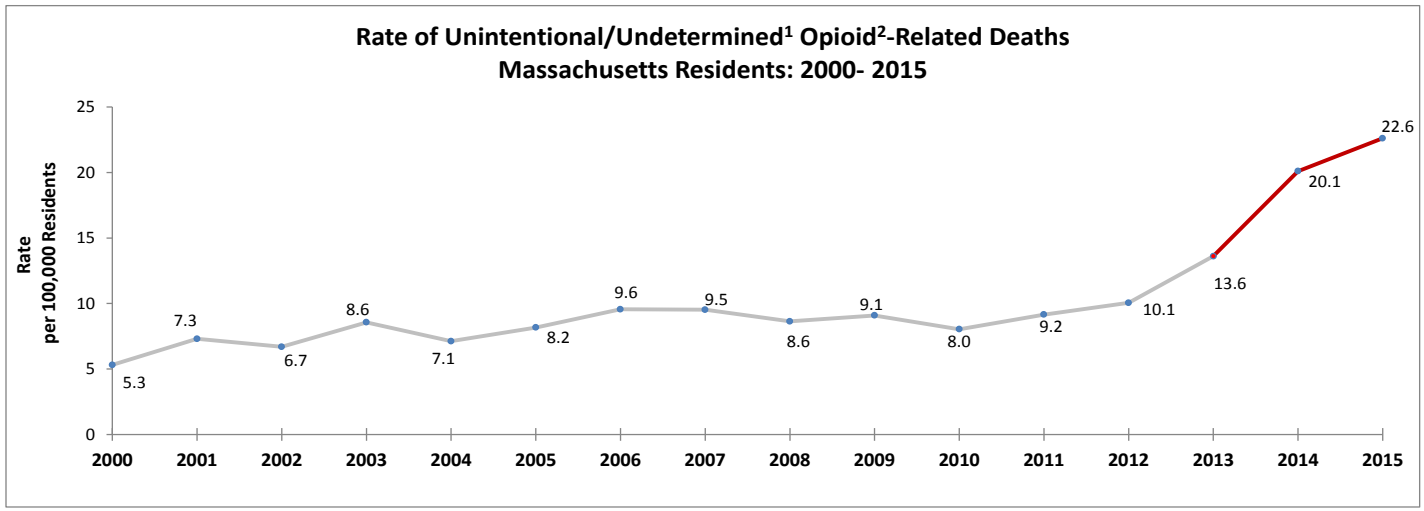
Massachusetts Department of Public Health

July 1, 2016

Commonwealth of Massachusetts
Department of Public Health

Opioid-related deaths in Massachusetts increased more than 350% from 2000 to 2015





Data Source: Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents, Massachusetts Department of Public Health, May 2016

Chapter 55 Provides the Legal Basis for Cross-Agency Collaboration to Study the Alarming Trends in Opioid-related Deaths

- Signed into law in August 2015
- Requires a comprehensive report to the Legislature and cross-agency collaboration to examine trends in opioid-related deaths and address 7 specific questions
- Specifies major data sets across government
- Overcomes legal barriers for use of some data

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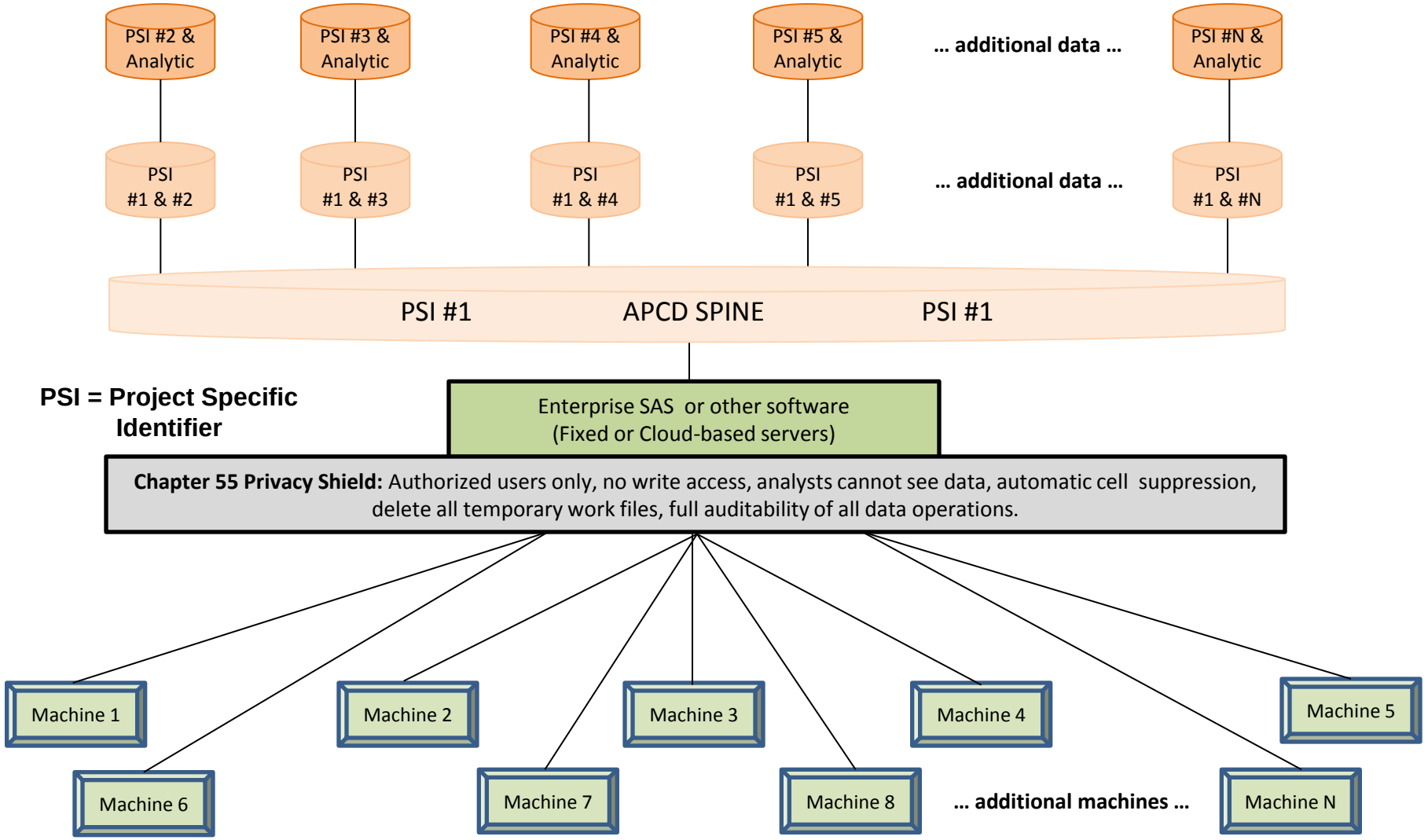
Department of Public Health

Chapter 55 Analysis is Conducted via a Secured Public Health Data Warehouse to which Only Authorized Users Have Access



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Chapter 55 – Data mapping

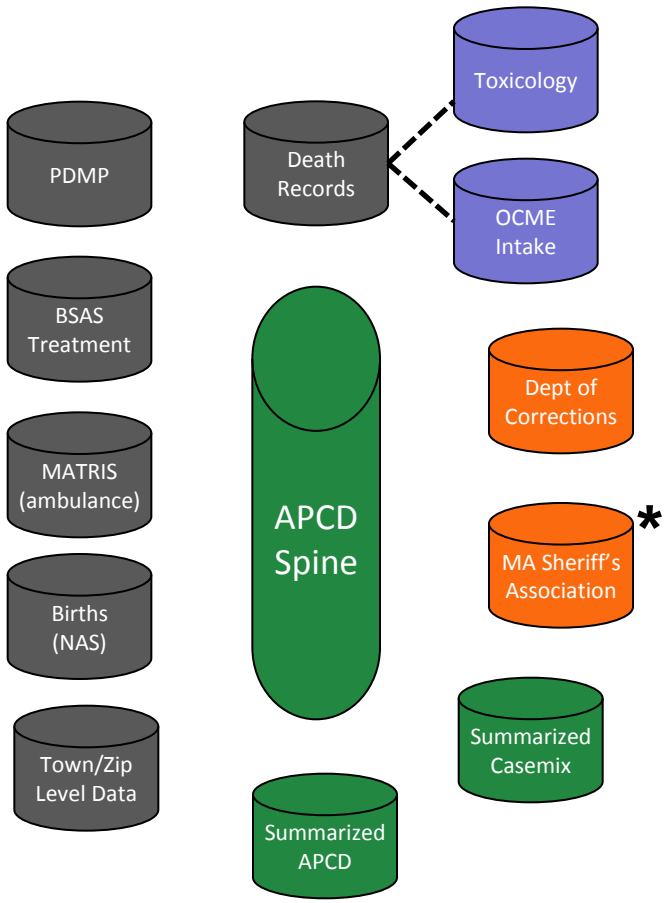
Data Sources

- DPH
- CHIA (MassHealth)
- EOPSS
- Jails & Prisons

System Attributes

- Data **encrypted** in transit & at rest
- Limited data sets **unlinked** at rest
- Simplified structure using **summarized** data
- Linking and analytics "on the fly"
- No residual files after query completed
- Analysts can't see data
- Automatic cell suppression
- Possible resolution to issues related to 42 CFR part 2

Chapter 55 Data Structure



All Doors Opening

- Significant coordination within DPH
- Financial and technical support from MassIT's Data Office
- CHIA takes on role as linking agent
- Coordination across agencies (legal & evaluation)
- Volunteer analytic support from academia and industry

* Note: Houses of Correction data was unavailable at the time this status update was written. As such, assessment does not reflect HOC inmate outcomes.

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The 7 Questions
Learning from Recent Opioid Deaths

Statutory Question	Analytic Question	Preliminary Findings
1. Instances of multiple provider episodes, meaning a single patient having access to opiate prescriptions from more than 1 provider	*Does an abnormally high number of prescribing physicians increase a patient's risk of fatal overdose?*	Individuals who obtain prescriptions for opioids from more than one prescriber may be at greater risk of death. Based on observed data, **the use of 3 or more prescribers within a 3 month period is associated with a 7-fold increase in risk of fatal opioid overdose**.
2. Instances of poly-substance access, meaning a patient having simultaneous prescriptions for an opiate and a benzodiazepine or for an opiate and another drug which may enhance the effects or the risks of drug abuse or overdose	*Does the concurrent use of benzodiazepines and opioids increase the risk of fatal opioid overdose relative to taking opioids alone?*	Preliminary findings support the hypothesis that increased risk of fatal overdose is associated with concurrent use of opioids and benzodiazepines. Based on observed data, **the concurrent use of benzodiazepines and opioids is associated with a 4-fold increase in risk of fatal opioid overdose**. Future analysis should include other drugs.

The 7 Questions
Learning from Recent Opioid Deaths

Statutory Question	Analytic Question	Preliminary Findings
3. The overall opiate prescription history of the individuals, including whether the individuals had access to legal prescriptions for opiate drugs at the time of their deaths	*Did opioid-related overdose decedents have access to legal opioids, defined as a prescription filled, around time of death?*	There is evidence to support an emerging hypothesis that illegally-obtained substances are the driving force behind opioid-related deaths. **At least 2 out of 3 people who died of an opioid-related overdose had an opioid prescription between 2011 and 2014.** But only 8.3% of opioid overdose decedents had an opioid prescription in the same month as their death. **Of those who died of an opioid overdose with toxicology reports, approximately 83% had illegally-obtained or likely illegally-obtained substances in their system at time of death.**

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The 7 Questions
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Statutory Question	Analytic Question	Preliminary Findings
4. Whether the individuals had previously undergone voluntary or involuntary treatment for substance addiction or behavioral health	*Substance abuse treatment history (voluntary and involuntary) of Massachusetts residents who died of opioid overdose.*	**Clients who received voluntary treatment had better outcomes than clients who received involuntary treatment.** Those who received involuntary treatment were 2.2 times more likely to die of opioid-related overdoses and 1.9 times more likely to die of any cause compared to those with a history of voluntary treatment and no history of involuntary treatment. **The majority of patients who received both voluntary and involuntary treatment were previously known to or diagnosed by the health care system** (e.g. previous opioid-related admission, prior mental health treatment, reported prior overdose).

The 7 Questions
Learning from Recent Opioid Deaths

Statutory Question	Analytic Question	Preliminary Findings
5. Whether the individuals had attempted to enter but were denied access to treatment for substance addiction or behavioral health	*Does denial of service lead to an increased risk of fatal opioid overdose?*	For this study period, denial of service information and waitlist data within the BSAS treatment system was not reliably captured to enable the understanding of the connection between denial of service and risk of death. Additionally, it should be noted that for individuals that would like to access treatment, a number of factors can complicate their access to care including homelessness, unemployment, insurance, childcare, criminal involvement, cost, wait time, distance to treatment, and other barriers. DPH's Substance Abuse Helpline is actively working to enhance efforts to increase access to treatment but is not itself a gatekeeper for access.

The 7 Questions
Learning from Recent Opioid Deaths

Statutory Question	Analytic Question	Preliminary Findings
6. Whether the individuals had received past treatment for a substance overdose	*Are those who have had a non-fatal overdose more likely to die from an overdose?*	It is assumed that people with substance use disorders who have a history of treatment for nonfatal opioid-related overdoses are at higher risk for eventually dying of an opioid-related overdose. Two datasets were used to identify nonfatal opioid-related overdoses: the Massachusetts Ambulance Trip Record Information System (MATRIS) and Acute Case Mix. At least 30% of MATRIS data was unreported and only 20% of data from MATRIS and Case Mix overlap. **At least 9.3% of people with a fatal opioid-related overdose had at least 1 prior nonfatal overdose event recorded in either Case Mix or MATRIS.** Due to the quality of the data, this is an underestimate. No differences were found by gender. However, there was a difference by age. Compared to people aged 45+, those aged 27 and under and those 28 to 34 were nearly twice as likely to have a previous overdose event before death.

The 7 Questions
Learning from Recent Opioid Deaths

Statutory Question	Analytic Question	Preliminary Findings
7. Whether any individuals had been previously detained or incarcerated and, if so, whether the individuals had received treatment during the detention or incarceration	*Does treatment during incarceration reduce likelihood of a fatal overdose?*	Under the DOC's current program and services, there does not appear to be a reduction in the likelihood of fatal opioid-related overdose for those inmates receiving DOC treatment as compared to those not known to have received DOC treatment. It should be noted that further analysis is needed to determine how the risks associated with being incarcerated (with or without treatment) impact the risk of overdose.

Conclusion

- Statute has authorized DPH to use data and partner with other government agencies to create a groundbreaking data linkage to perform this study and analysis.
- This study highlights government's ability to work collaboratively towards efficiently solving complex and urgent problems.
- The analytic approach authorized by Chapter 55 has enabled Massachusetts to serve as a national example of how government can leverage data warehousing to respond to pressing policy and health concerns.
- DPH appreciates the opportunity provided by this statute and looks forward to sharing the results of its full report.