Data, Determinants & Disparities: A framework to drive public health policy

Massachusetts Health Policy Forum: Student Forum

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Commissioner
Massachusetts Department of Public Health
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What will it take to make you healthy?
Baker-Polito Administration

Governor Charlie Baker & Lieutenant Governor Karyn Polito

Health and Human Services Secretary Marylou Sudders

Department of Public Health Commissioner Monica Bharel
About DPH

1799
History of department dates to Paul Revere

8 Bureaus, 6 Offices
DPH covers a range of issues from birth until death

15 sites, 3000 employees
DPH is located across the Commonwealth, and partners with local boards of health

$1 billion
Annual budget, comprised of federal, state, and grant funding
The Range of DPH

Massachusetts DPH will continue to be a national leader in innovative, outcomes-focused public health based on a data-driven approach, with a focus on quality public health and health care services and an emphasis on the social determinants and eradication of health inequities.
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
Social Determinants

Individual resources
Education, occupation, income, wealth

Opportunity structures
Schools, jobs, justice

Neighborhood resources
Housing, food choices, public safety, transportation, parks and recreation, political clout

Hazards and toxic exposures
Pesticides, lead, reservoirs of infection

CDC: Social Determinants of Health and Social Determinants of Equity, the Impacts of Racism on the Health of our Nation
CDC Health Impact Pyramid

- Smallest impact
  - Counseling & education
    - Eat healthy, be physically active
  - Clinical interventions
    - Rx for high blood pressure, high cholesterol, diabetes
    - Immunizations, brief interventions
  - Long-lasting protective interventions
    - Fluoridation, no trans fat, smoke-free laws
    - Poverty, education, housing, inequality
  - Changing the context to make individuals' default decisions healthy

- Largest impact
  - Socioeconomic factors
A FOCUS ON HEALTH EQUITY
U.S. Infant Mortality Rate 2011

CDC Vital Statistics
Infant Mortality Rates in Massachusetts’ Largest Cities 2012

Statewide rate = 4.26

**All Causes of Death - Infant Deaths (ICD 10)**

<table>
<thead>
<tr>
<th>City</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somerville</td>
<td>2.05</td>
</tr>
<tr>
<td>Cambridge</td>
<td>2.36</td>
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<tr>
<td>Quincy</td>
<td>3.19</td>
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<tr>
<td>Lowell</td>
<td>3.6</td>
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<tr>
<td>Springfield</td>
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<td>New Bedford</td>
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<tr>
<td>Framingham</td>
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<td>Boston</td>
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<tr>
<td>Newton</td>
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<tr>
<td>Brockton</td>
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<tr>
<td>Lawrence</td>
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<tr>
<td>Lynn</td>
<td>7.32</td>
</tr>
<tr>
<td>Worcester</td>
<td>7.47</td>
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<tr>
<td>Massachusetts</td>
<td>4.26</td>
</tr>
</tbody>
</table>

Infant Mortality, 2012 **
Per 1,000
- 2.05 - 3.13
- 3.14 - 4.21
- 4.22 - 5.30
- 5.31 - 6.38
- 6.39 - 7.47

** County Boundaries
Community Boundaries

Mortality data courtesy of MA DPH. Map created by BEH-GIS, MDPH
Worcester Infant Mortality

Source: Worcester Healthy Baby Collaborative
Boston Neighborhoods with High Rates of Chronic Disease Hospitalizations

Keep your eye on “the crescent”

Legend
- High (3)
- Moderate (2)
- Low (0 or 1)

*2012 CHIA Hospital Discharge Data, age adjusted
Boston Neighborhoods with Poor Perceived Safety

*Boston Neighborhood Survey (BNS), 2008; Harvard Youth Prevention Center through Cooperative agreement with the CDC
Boston Neighborhoods with a High Rent Burden

* American Community Survey, 2008-2012, US Census Bureau

Legend
- Higher than Boston Overall
- Same as Boston Overall
- Lower than Boston Overall
Boston Neighborhoods with Low Access to Healthy Food (mRFEI)

* Modified Retail Food Environment Index, CDC
But put them all together and...
High rates of Chronic Disease
Chronic Disease + Poor Safety + High Rent
Chronic Disease + Poor Safety + High Rent + Poor Food Access
What else is going on in “the crescent”...
Place Matters

Map Source: 2011 Health of Boston Report
Data Source: Census 2000, US Census Bureau
Redlining of Boston Neighborhoods

Case Study: Opioid Data

Analyzing data, determinants and disparities to produce good policy
The rate of opioid-related overdose deaths decreased for a second straight year – for a total of an estimated 4% decrease from 2016 to 2018.

Figure 3. Rate of Confirmed and Estimated Opioid-Related Overdose Deaths, All Intents
Massachusetts Residents: 2000 - 2018

- Rate of opioid-related overdose deaths decreased for a second straight year.
- For a total of an estimated 4% decrease from 2016 to 2018.
Fentanyl remains a key factor in opioid-related overdose deaths (93% present in toxicology screen).
• Registered MassPAT providers conducted more than 2.2 million searches in the 3rd quarter of 2019, an increase of approximately 200,000 searches since the previous quarter.

• There were just over 500,000 Schedule II opioid prescriptions reported to the MA PMP in the 3rd quarter of 2019; this is a notable decrease from the previous quarter and just over a 40% decrease from the 1st Quarter of 2015.

• In the 3rd quarter of 2019, just over 227,000 individuals in Massachusetts received prescriptions for Schedule II opioids; this is a small, but notable, decrease from the previous quarter and nearly a 42% decrease from the 1st quarter of 2015.
Opioid Death Rate by Race/Ethnicity

• **Key Finding:** Between 2016 and 2017, confirmed opioid-related overdose death rate increased for Black non-Hispanics, decreased for White non-Hispanics and Hispanics.
Death rates for males of all races and ethnicities except Asian/Pacific Islanders decreased between 2017 and 2018. Hispanic opioid-related overdose death rate remained the highest death rate across all racial/ethnic groups since 2016.
Chapter 55 Report & Data Brief
Data Mapping

Data Sources
- Public Health
- Medical Claims & Hospital
- MassHealth
- Mental Health
- Public Safety
- Jails & Prisons
- Other Law Enforcement
- DHCD (Homelessness)
- Veterans’ Services
- Service Flags
- Aggregate (Town, Zip, etc.)

Chapter 55 Data Structure
- PDMP
- BSAS Treatment
- MATRIS (EMS)
- Birth Records
- Cancer Registry
- Medical Claims
- Hospital and ED
- Veterans’ Services
- DMH
- DHCD
- Toxicology
- OCMER Intake
- State Police Opioid
- MA Prisons
- MA Jails
- MassHealth
- APCD Spine

System Attributes
- Linkage at individual level
- Longitudinal (5 year history)
- Data encrypted in transit & at rest
- Limited data sets unlinked at rest
- Linking and analytics “on the fly”
- No residual files after query completed
- Analysts can’t see data
- Automatic cell suppression

Community Level Data
- NARCAN Distribution
- Town & Zip Census Data
- Needle Exchange
- Drug Seizure Data
- I.C.E. Measures
- MDPNetwork Depression

Service Indicator Flags
- Children & Families
- Dept Dev Services
- Transitional Assistance
- Youth Services
- Commission for Blind
Opioid Use Disorder (OUD)


- 2011: 2.0%
- 2012: 3.0%
- 2013: 3.5%
- 2014: 4.0%
- 2015: 4.5%

% OUD in MA Population
Average Survival Time For Those Who Died of Opioid Overdose was 36 Months.
Patients treated with methadone and/or buprenorphine (Opioid Agonist Treatment or “OAT” that block the effect of opioids) following a non-fatal overdose were significantly less likely to die; however, very few patients (~5%) engage in OAT following a non-fatal overdose.
Persons with Histories of Incarceration

Opioid Death Rate 120 Times Higher for Individuals with Histories of Incarceration
Persons Experiencing Homelessness

Opioid Death Rate 30 Times Higher for the Homeless Individuals
Individuals with Serious Mental Illnesses

High Rates of Fatal Opioid Overdoses for Persons with Some Mental Health Diagnoses

- Anxiety: 30.3
- Depression: 34.1
- ADHD: 37.0
- SMI: 86.1* (MassHealth members only)
- MA: 12.8

* MassHealth members only
Pregnant and Postpartum Risk

Rate of Opioid Overdose Events Increase Sharply After Delivery for OUD Mothers

- 1 year before delivery, prior to conception: 2.1
- First Trimester: 1.9
- Second Trimester: 0.7
- Third Trimester: 0.7
- 0—42 days after delivery: 2.5
- 43—180 days after delivery: 2.4
- 181—365 days after delivery: 3.6

Overdose Events / 1 Million Person Days