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## Opioid Overdoses Among High-Risk Medicaid Members: Healthcare Cost, Service Utilization, and Risk Factor Analysis

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## OBJECTIVES

- Examine the Demographic, Clinical, and Overdose Outcome Profiles Among:
  - Individuals involved with the criminal justice system
  - Homeless individuals
  - Individuals with unstable housing
- Analyze Risk Factors
  - Conduct multivariate analysis of fatal and/or non-fatal opioid overdose outcomes of three high-risk populations, controlling for mental and physical health diagnoses, sociodemographic characteristics, and state agency engagement
- Explore Service Utilization and Cost
  - Behavioral health services, medical services, and prescription drug use

## BACKGROUND

- ### High-Risk Populations
- 50-75% of individuals involved in the criminal justice system have a substance use disorder (SUD), compared with 8-10% in the general population, with state inmates reporting regular use (13%)
  - One in three deaths of homeless individuals under age 45 is due to drug overdose, primarily due to opioids, a rate 16-24 times higher than in the MA general population
  - SUDs and Serious Mental Illness (SMI) diagnoses are higher among MassHealth members (5% and 17%, respectively) than the general population with correspondingly high service use, though opioid disorder service use was disproportionately low

## STUDY DESIGN

- ### Data Source: Public Health Data (PHD) Warehouse
- Assembled to enable MA Department of Public Health (MDPH) to report on analyses of fatal and non-fatal opioid overdose as required by Chapter 55 of the Acts of 2015, as amended by Chapter 133 of the Acts of 2016
  - Permits linkage and analysis of multiple government data sets to better understand the opioid epidemic
    - MassHealth member, eligibility and enrollment data, and claims and encounter data
  - Assists in guiding policy development and making programmatic decisions

### Study Population

- Individuals ages 11-64 enrolled in MassHealth who were considered in need of services
- Three high-risk populations of interest:
  - Criminal justice involved (CJ)
  - Homeless
  - Unstably housed (UH)

### Data Analysis

- Outcome Measures
  - Fatal and non-fatal opioid overdoses
- Independent Variables
  - Demographic characteristics
  - Clinical diagnoses
  - Healthcare utilization – both inpatient and outpatient
  - Substance use treatment services
  - Behavioral health (BH) services including treatment and diversionary services, and home- and community-based outpatient services
  - Prescription drug use
- Key characteristics of the three high-risk populations
  - Demographics
  - Fatal and non-fatal opioid overdoses
  - Healthcare expenditures
- Service use and healthcare utilization before, after, and in-between multiple overdoses
  - General healthcare services
  - BH services
  - Prescription drug use
- Multivariate logistic regression analyses assessing:
  - Fatal overdoses only
  - Non-fatal overdoses only
  - Non-fatal overdoses followed by a fatal overdose
  - Any opioid overdose (fatal or non-fatal)
- Independent variables included:
  - High-risk populations
  - Mental health and medical diagnoses
  - Demographics
  - State agency involvement

## PRINCIPAL FINDINGS

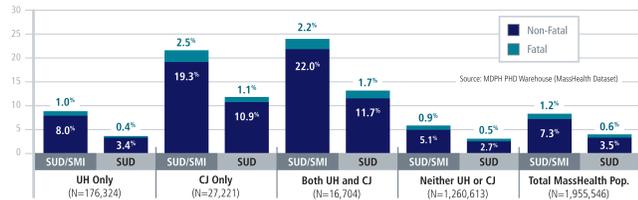
### DEMOGRAPHIC CHARACTERISTICS

MassHealth Member Characteristics: Total, Criminal Justice Involved, Unstably Housed, and Homeless, Ages 11-64: 2011-2015	Population			
	Total MassHealth Members N=1,955,546	Criminal Justice N=46,884	Unstably Housed N=193,028	Homeless N=91,165
Age	%	%	%	%
11-20 years	20.1	0.9	21.4	3.9
21-34 years	31.8	46.2	38.3	30.6
35-64 years	48.1	52.9	40.3	65.5
Gender	%	%	%	%
Male	47.7	77.1	44.8	58.7
Female	52.2	22.9	55.1	41.3
Mental Health Diagnoses (select)	%	%	%	%
SUD and SMI	11.7	55.1	29.2	74.7
SUD	5.2	17.7	6.7	9.2
SMI	17.1	6.9	22.7	12.3

Source: MDPH PHD Warehouse (MassHealth Dataset)

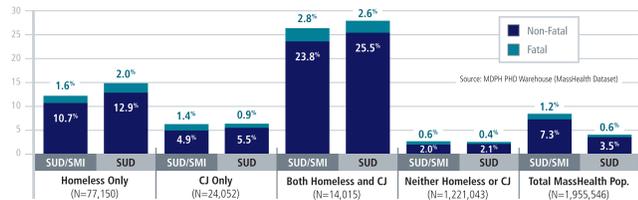
### FATAL AND NON-FATAL OPIOID OVERDOSES

#### Percent Distribution of Opioid Overdoses Among Unstably Housed and Criminal Justice Involved High-Risk Populations, by Mental Health Diagnoses, MassHealth Members: 2011-2015



- Members with dual SUD/SMI diagnoses had fatal and non-fatal overdoses double in proportion to those with a SUD diagnosis alone
- Members who were involved in the criminal justice system and unstably housed had non-fatal overdoses which were proportionately three times higher and fatal overdoses which were proportionately two times higher than the total MassHealth population

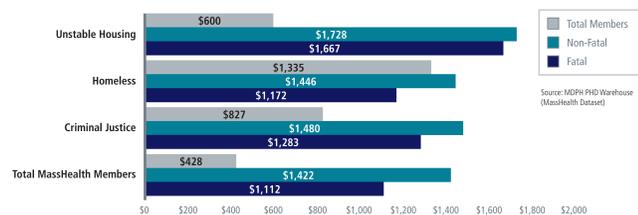
#### Percent Distribution of Opioid Overdoses Among Homeless and Criminal Justice Involved High-Risk Populations, by Mental Health Diagnoses, MassHealth Members: 2011-2015



- Being both homeless and criminal justice involved compounded the risk for a non-fatal overdose, regardless of diagnostic category; compared to the total MassHealth population:
  - Members with co-occurring BH diagnoses had non-fatal overdose percentages three times higher
  - Members with a single SUD diagnosis had non-fatal overdose percentages that were seven times higher

### HEALTHCARE EXPENDITURES

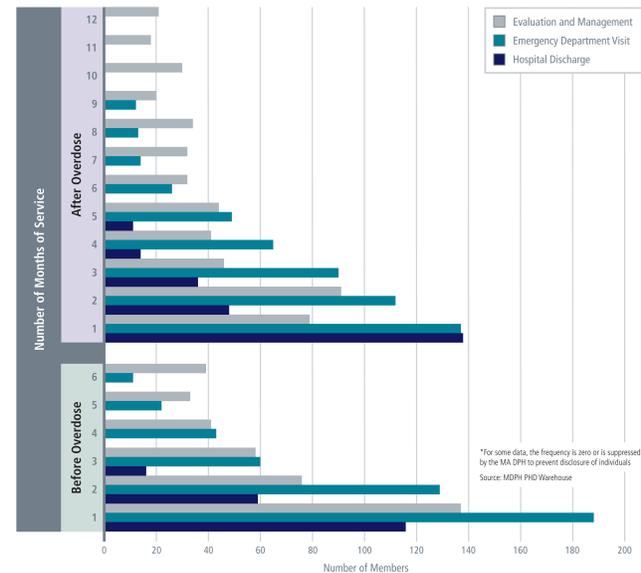
#### 4-Year Average MassHealth Paid Claims Per Member Per Month (PMPM) by Opioid Overdose Outcome for Unstably Housed, Homeless, and Criminal Justice Involved Members and MassHealth Members Overall: 2012-2015



- MassHealth members with a non-fatal overdose had consistently higher PMPM costs than those with a fatal overdose
- All three high-risk populations had higher costs, regardless of having an opioid overdose, compared to the overall MassHealth population

### SERVICE USE

#### Frequency Distribution of the Number of Months of Healthcare Utilization for MassHealth Members Ages 11-64 in the 6 Months Before and 12 Months After a Third Non-Fatal Overdose: 2011-2015 (N=1,153)\*



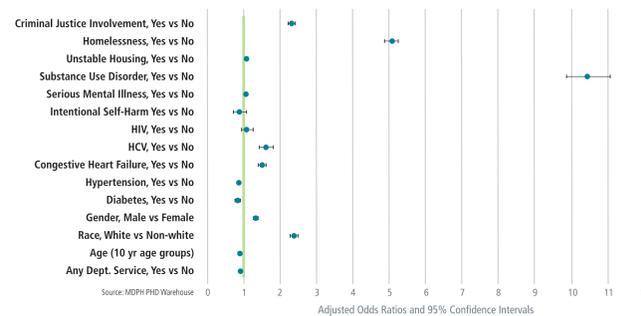
- Similar patterns were seen for BH and prescription drug services

### RISK FACTOR ANALYSIS

#### Multiple Logistic Regression Analyses

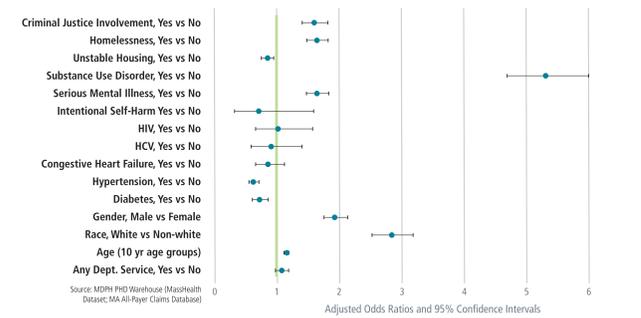
- All independent factors describing fatal and non-fatal opioid overdoses were assessed for contribution to overdose risk
- Independent variables included: high-risk population group status, mental health diagnoses, chronic medical conditions, demographic characteristics, and engagement with state agencies
- Dependent variables included:
  - Fatal overdoses only
  - Non-fatal overdoses only
  - Non-fatal overdoses followed by a fatal overdose
  - Any opioid overdose (fatal or non-fatal)

#### Factors Associated with Having Any Opioid Overdose; MassHealth Members 11-64 Years: 2011-2015 (N=16,992)



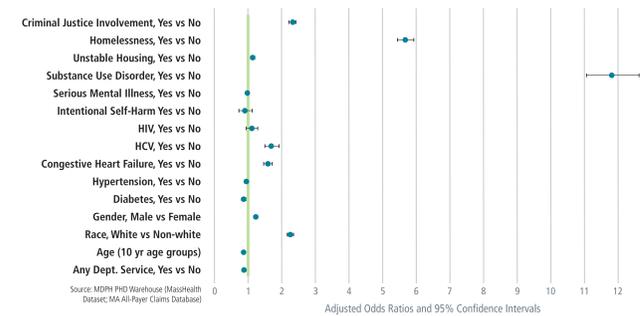
- Criminal justice involvement and homelessness were significantly related to an increase in having an opioid overdose (two times and five times, respectively)
- SUD and SMI were significantly related to an increase (more than 10 times and 6%, respectively)
- HCV and CHF were significantly related to increased overdose outcomes (60% and 50%, respectively)
- Hypertension and diabetes – 13% and 17% less likely to have an overdose, respectively
- Males and whites were more likely to have an opioid overdose (30% and twice as likely, respectively)

#### Factors Associated with Having a Fatal Opioid Overdose Only; MassHealth Members, Ages 11-64: 2011-2015 (N=2,023)



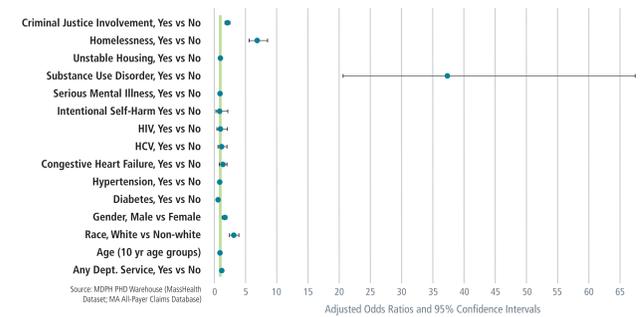
- Members with criminal justice involvement and those experiencing homelessness were 60% and 64%, respectively, more likely to have a fatal overdose than those without these risk factors
- Members having a SUD or a SMI were also more likely to have a fatal overdose (five times and 60%, respectively)
- Hypertension and diabetes were protective against a fatal overdose (38% and 28% less likely, respectively)

#### Factors Associated with Having a Non-Fatal Opioid Overdose Only; MassHealth Members, Ages 11-64: 2011-2015 (N=14,370)



- All high-risk populations showed a significant increase in risk of a non-fatal overdose: criminal justice involvement (more than twice as likely); homelessness (nearly six times more likely)
- Other significant risk factors included: having a SUD (nearly 12 times more likely to have a non-fatal overdose); having HCV (nearly 70% more likely); having CHF (60% more likely); male gender (22% more likely); and white race (more than twice as likely)

#### Factors Associated with Having a Non-Fatal Opioid Overdose followed by a Fatal Overdose; MassHealth Members 11-64 Years: 2011-2015 (N=599)



- Criminal justice involved persons were two times more likely, and those experiencing homelessness nearly seven times more likely, to have a non-fatal overdose followed by a fatal overdose
- Members with a SUD were nearly 40 times more likely
- Males and whites were more likely (70% and over three times, respectively)
- Members with diabetes were 40% less likely to have a non-fatal overdose followed by a fatal overdose

## LIMITATIONS

- Missing Data:
  - Varied across data sources; comparison of findings difficult across groups
  - Resulted in some records with missing data for select variables not included in creation of some algorithms
- Data from some sources within the PHD dataset were not available for the full 5-year study period
- All data were collected for administrative, not research purposes, and may be incomplete or not validated

## CONCLUSIONS

- Overdose risk was two to five times more likely among homelessness individuals and nearly twice as likely for justice-involved members.
- BH diagnoses appear to have an impact on rates of opioid overdoses for high-risk groups, with much higher rates among those with co-occurring SUD/SMI than MassHealth members in general.
- Multivariate analyses consistently showed that gender (male) and race (whites) were significantly associated with increased overdose risk.
- Most members received services for 1-2 months in both the pre- and post-overdose periods; service use was relatively low in the year following a non-fatal overdose, suggesting retention was also low.
- Average 4-year PMPM costs were much higher for MassHealth members experiencing fatal and non-fatal overdoses than those without an overdose.
- These findings inform MassHealth's understanding of its members' experiences regarding medical and BH services and identification of risk factors predictive of overdose may help guide future policies and programs.

## IMPLICATIONS FOR POLICY/PRACTICE

- Understanding opioid overdose risk factors and identifying service utilization gaps and missed opportunities are important.
- As payment reforms evolve under the umbrella of ACOs, BH community partnership models are key for collaborating with healthcare and social service providers, and community resources for care management, care coordination, and referrals to support services.
- Our study initially developed an in-depth descriptive analysis of individuals with SUD, SMI, or both identified as being at high risk for an opioid overdose. Understanding service trajectory and outcomes through additional analyses was critical for planning and prioritizing appropriate services.
- As payors are actively making decisions about effective systems of care, they are interested in understanding the need for community-based and residential services, including for those with housing instability and/or criminal justice involvement.

### For additional information and questions, contact:

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