Opioid Use Disorder Report Updates

August 2017

MASSACHUSETTS
HEALTH POLICY COMMISSION

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Introduction

Like many states across the country, Massachusetts is facing a growing epidemic of opioid addiction and overdose deaths. From 2000 to 2015, the opioid-related death rate in Massachusetts quadrupled, and by 2015 it was twice the national average. As previously reported by the Massachusetts Health Policy Commission (HPC), this epidemic significantly impacts the health care system as the number of patients seeking opioid-related care and treatment at Massachusetts hospitals is rapidly increasing.

This chart pack updates the findings of the **HPC's Opioid Use Disorder Report**, published in September 2016. That report, required by Chapter 258 of the Acts of 2014, evaluated the impact of the opioid epidemic on the health care system and made the following recommendations:

1. The Commonwealth should **systematically track the impact of the opioid epidemic on the health care system** and the availability of evidence-based pharmacologic treatment.
2. The Commonwealth should **increase access to and effectiveness of evidence-based opioid use disorder treatment** by **integrating pharmacologic interventions** into systems of care.
3. The Commonwealth should support **coordinated, multi-stakeholder coalitions** to address the impact of the opioid epidemic locally.
4. The Commonwealth should **test, evaluate, and scale innovative care models** for preventing and treating OUD and related conditions.

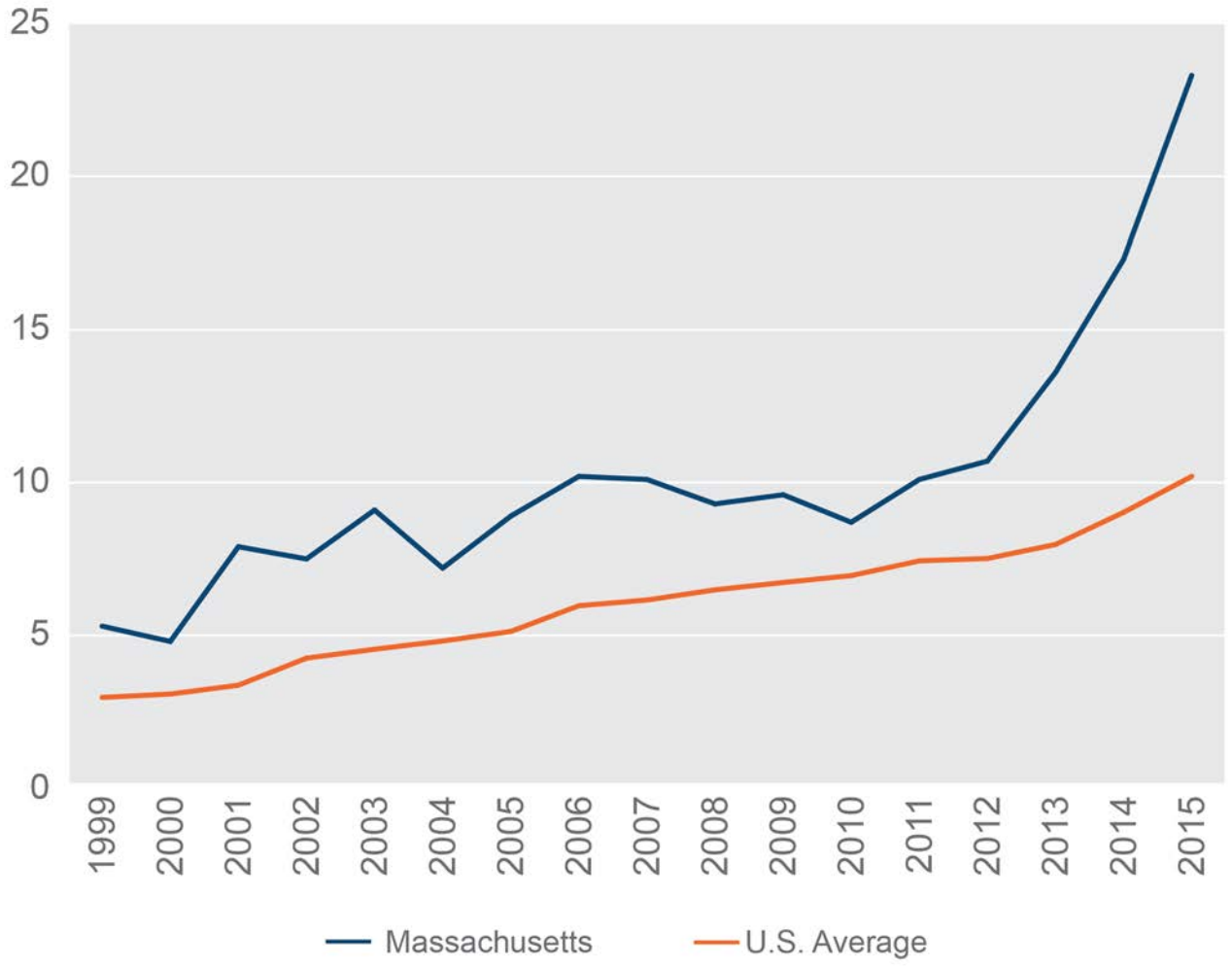
Over the past two years, the Executive Office of Health and Human Services (EOHHS), the Office of the Attorney General, the HPC, and the Center for Health Information and Analysis (CHIA) have worked collaboratively to improve data collection efforts to better track and address the epidemic. In parallel to the HPC's annual tracking of opioid-related health care utilization, the Department of Public Health (DPH) is tracking opioid-related fatal and non-fatal overdoses, as well as linking such events to other state databases to identify potential mechanisms of earlier intervention.

This chart pack presents 2015 data (October 2014 through September 2015), as well as time trends in opioid-related discharges (both emergency department and inpatient) from 2011 to 2015. The data show that **the epidemic has affected every racial, socioeconomic, gender, and age group in the Commonwealth** and that **opioid-related discharges increased in every region** from 2011 to 2015.

Key Findings

- From 2011 to 2015, the number of opioid-related hospital discharges in Massachusetts increased substantially. Heroin-related discharges grew 256% while all other opioid-related discharges grew 50%.
  - The largest annual growth rate during this time period occurred between 2014 to 2015, when the number of opioid-related hospital discharges grew 18%.
- In 2015, the number of opioid-related hospital discharges varied by region. The Berkshires and Metro South had the highest rates of opioid-related discharges per population with over 1,300 discharges per 100,000 population each, while East Merrimack and Central Massachusetts had the highest growth in opioid-related discharges (121% and 104%, respectively) from 2011 to 2015.
- Residents living in the lowest-income areas experienced the highest rate of growth of opioid-related discharges between 2011 and 2015 (72%) and, despite accounting for only 25% of the Commonwealth's population, accounted for 36% of all opioid-related discharges in 2015.
- Since 2011, patients between the ages of 20 and 44 have comprised the largest share of opioid-related hospital discharges (70% in 2015, despite making up 34% of the state's population). Between 2011 and 2015, there was a shift in volume of opioid-related discharges from patients in their early 20s to patients in their late 20s and early and late 30s.
- In 2015, public payers covered 76.1% of all opioid-related hospital discharges, a slight increase from 74.2% in 2011.
- Non-Hispanic Whites had both the highest rate of opioid-related discharges in 2015 (10.5 discharges per 1,000 population), and the highest growth rate from 2011 to 2015 (59%), though other populations also had substantial growth. During this time period, opioid-related discharges grew 47% among Hispanic residents and 30% among non-Hispanic Blacks/African Americans

Opioid-related drug overdose deaths, per 100,000, 1999-2015, Massachusetts and the US



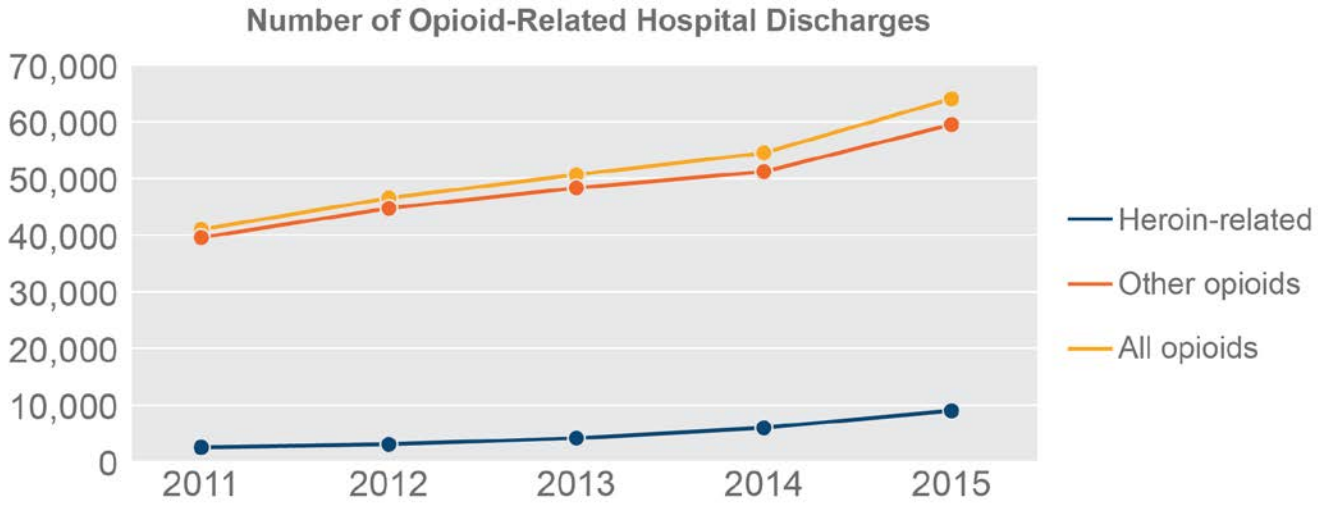
From 2010 to 2015, the rate of opioid-related drug overdose deaths in Massachusetts increased more rapidly than the national average. There was a particularly sharp growth between 2014 and 2015 in Massachusetts– an increase of 6 deaths per 100,000 compared to an increase of 1.2 deaths per 100,000 across the US.

Since opioid-related drug overdose deaths occur at relatively young ages, the impact on average life expectancy is particularly pronounced. When measured by years of potential life lost[1] before age 75, Massachusetts residents lost 60,000 years of life in 2015 due to poisonings (most of which are opioid-related), more than heart disease and any category other than cancer and unintentional injuries.

Sources: HPC Analysis of Multiple Cause of Death data (1999-2015), produced by the Division of Vital Statistics, National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC), United States Department of Health and Human Services (US DHHS).

Notes: (1) Years of potential life lost analysis includes ages 0-75; poisonings were identified using ICD-10 T36-T50, of which opioid overdoses are a main contributor.

Opioid-related hospital discharges, 2011-2015



Rate of Change in Opioid-Related Hospital Discharges

	Years	Heroin-related	Other opioids	All opioid-related
Growth	2011-2012	22%	13%	14%
	2012-2013	35%	8%	9%
	2013-2014	44%	6%	8%
	2014-2015	50%	16%	18%
	2011-2015	**256%**	**50%**	**56%**

Since 2011, opioid-related hospital discharges have grown substantially in Massachusetts, accelerating to 18% growth between 2014 and 2015.

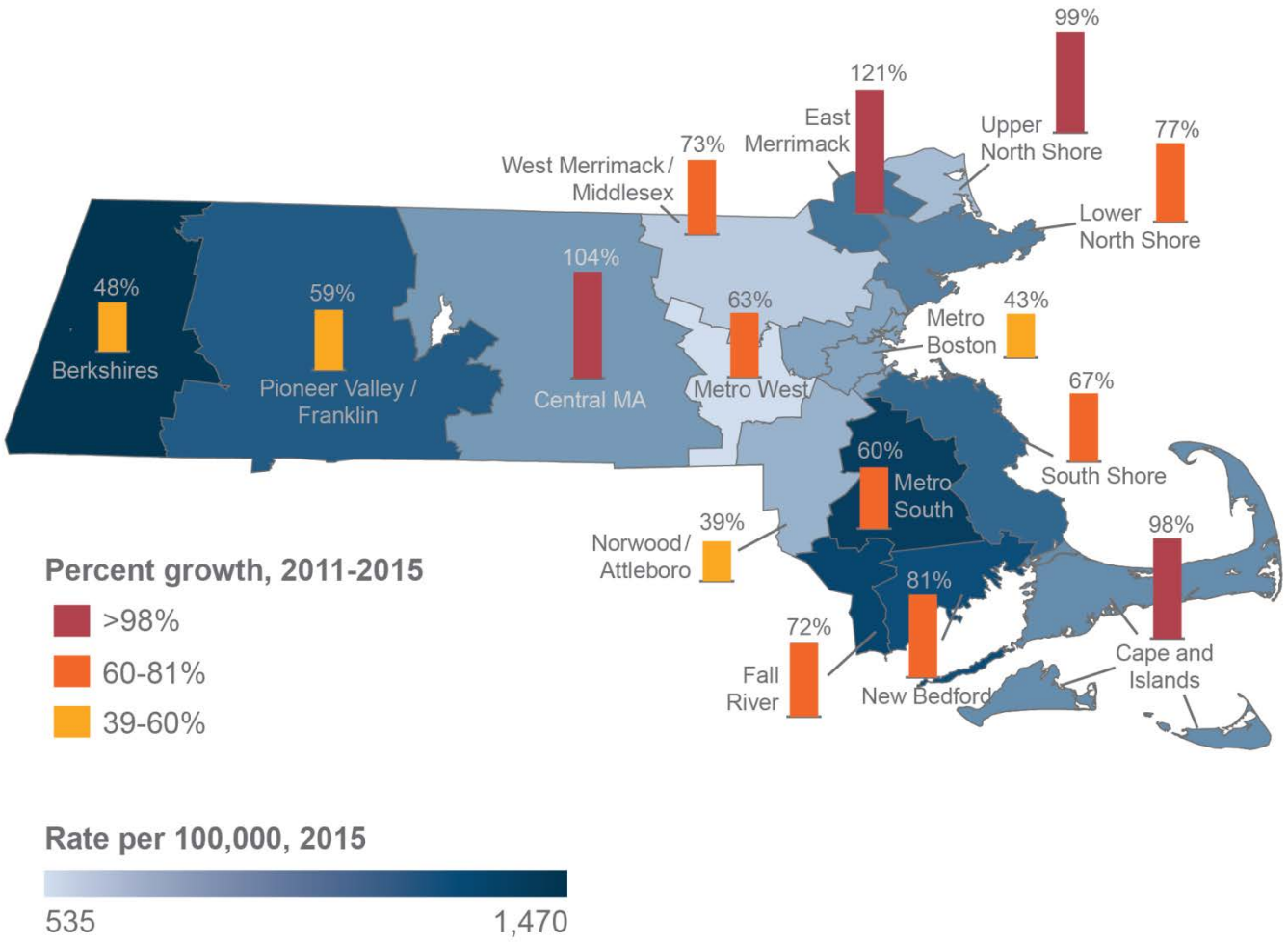
Heroin-related discharges have increased even more rapidly (50% from 2014 to 2015) though they still comprise just 14% of all opioid-related discharges in 2015. While most opioid-related deaths involve heroin and/or fentanyl,[1] most opioid-related hospital utilization is related to prescription opioids.

Source: Data: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011-2015. (1) Massachusetts Department of Public Health, *Data Brief: Opioid-related Overdose Deaths Among Massachusetts Residents*, Nov 2016

Notes: From 2011 to 2014 the CHIA databases included only the patient's first 15 diagnosis codes. However, in 2015 all of a patient's diagnosis codes were included. An additional 1,300 inpatient stays with an 'other opioid' diagnoses were counted in 2015 due the expansion of diagnoses codes available in the data, while less than 11 additional patients with heroin diagnoses were counted. The data presented here is based on the patient's 15 first diagnoses codes. The heroin-related and other opioid categories are not mutually exclusive, but the all opioid category only counts each discharge once.

HPC

Opioid-related hospital discharges by HPC region, mapped by patient's zip code, 2011 and 2015



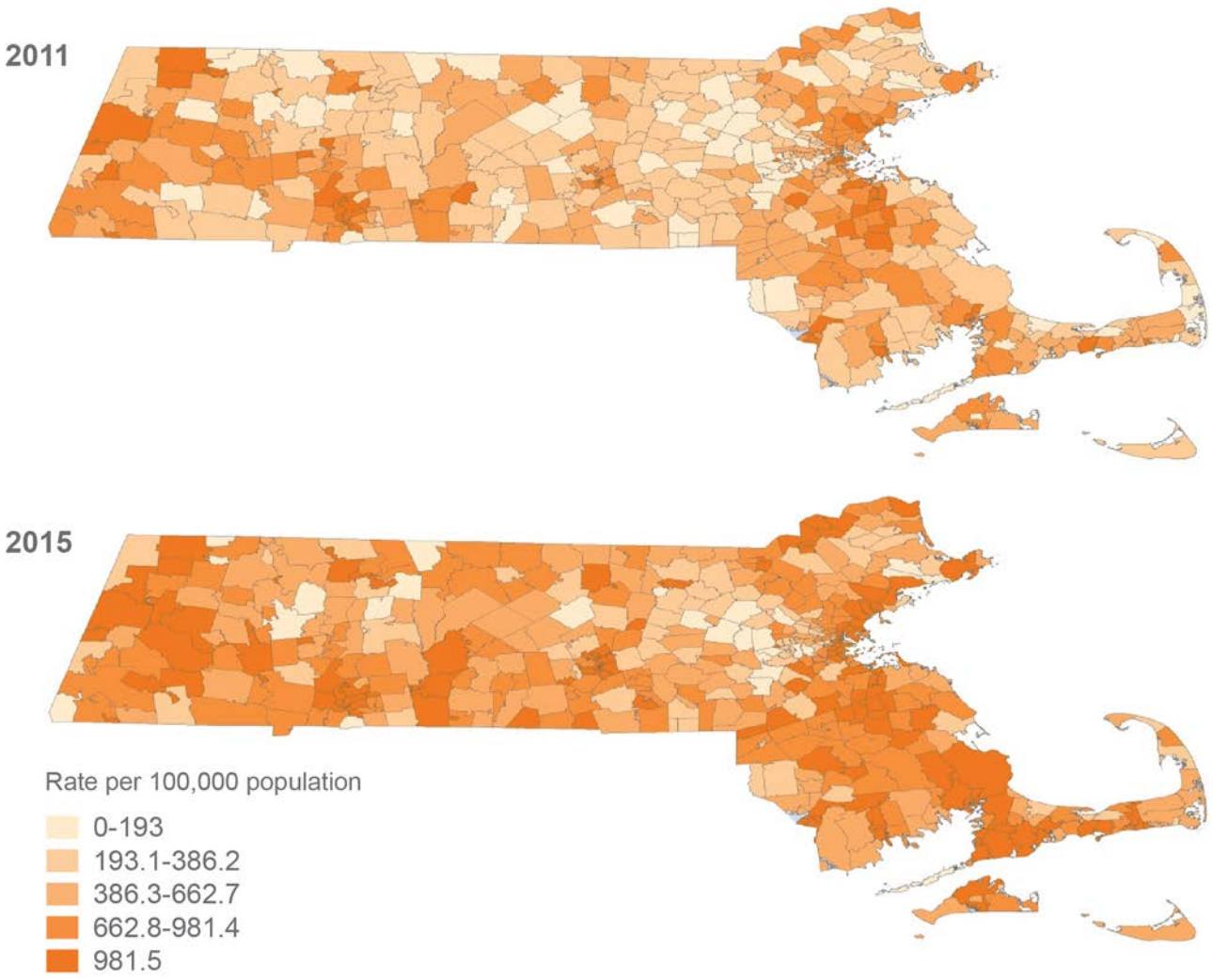
In 2015, the Berkshires and Metro South had the highest rate of opioid-related discharges per population with 1,406 and 1,305 discharges per 100,000 population, respectively. Meanwhile, West Merrimack/Middlesex and Metro West had the lowest rates of opioid-related discharges in 2015 with 636 and 517 discharges per 100,000 population, respectively.

From 2011 to 2015, opioid-related hospital discharges grew in every region of Massachusetts, though some regions experienced particularly high growth. For example, the rate of opioid-related discharges more than doubled in East Merrimack and Central Massachusetts and nearly doubled in the Upper North Shore and Cape and Island regions. The Metro Boston and Norwood/Attleboro regions had lower but still noteworthy growth in opioid-related discharges at approximately 40%.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015

Notes: Mapped by a patient's permanent zip code, not the site of care. 2015 data includes opioid-related discharges identified only using the patient's first 15 diagnoses. There are 15 HPC regions, which are based on patterns of patient travel for inpatient care. For more information on how HPC created these regions, please see: **http://www.mass.gov/anf/docs/hpc/2013-cost-trends-report-technical-appendix-b3-regions-of-massachusetts.pdf.**

Opioid-related hospital discharges, mapped by patient zip code, 2011 and 2015



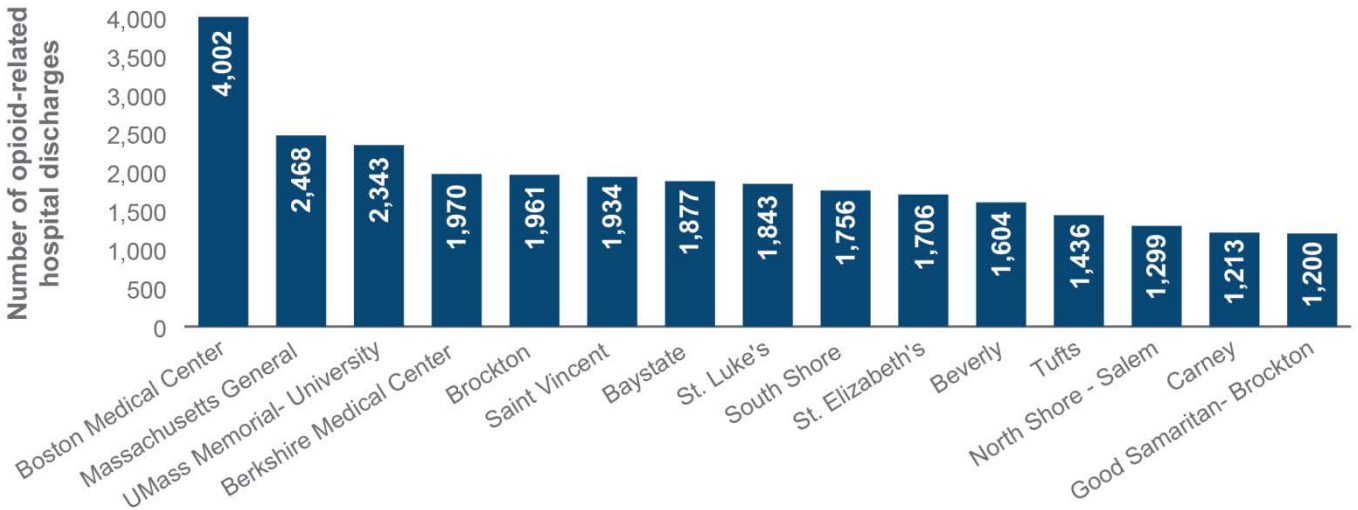
Drilling down further, HPC mapped opioid-related hospital discharges by patient zip code.

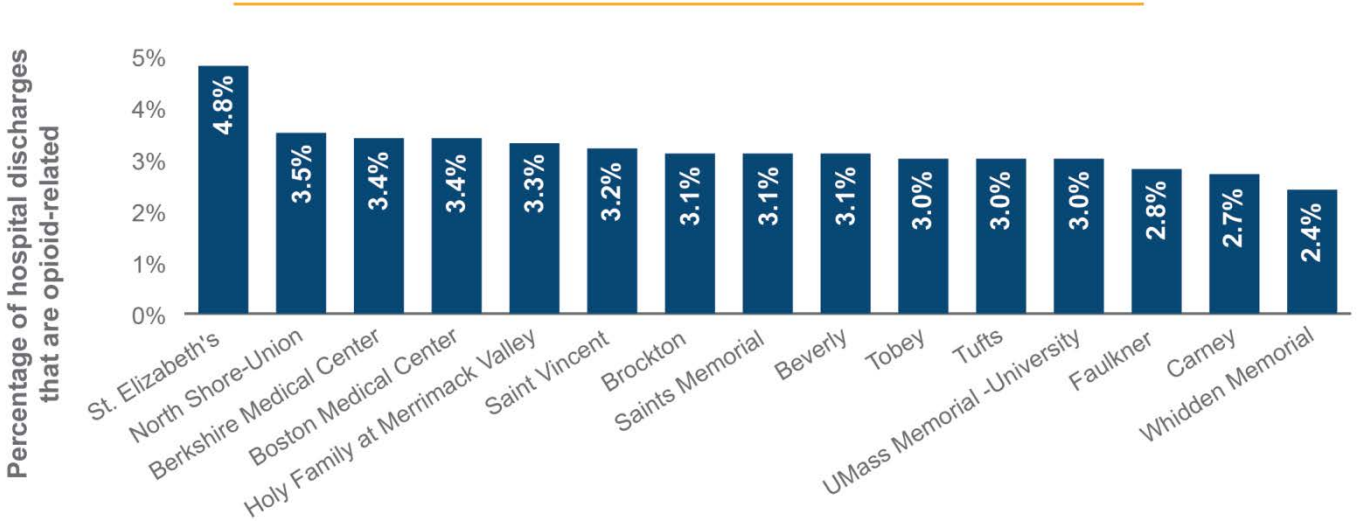
As shown, in both 2011 and 2015 there was considerable variation across the Commonwealth, but the rate grew in most zip codes.

In 2015, a much higher proportion of communities were in excess of 981.5 opioid-related discharges per 100,000 population (28% compared to 11% in 2011).

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015
Notes: Mapped by a patient's permanent zip code, not the site of care. 2015 data includes opioid-related discharges identified using all of a patient's diagnoses.

Opioid-related hospital discharges, top 15 hospitals, 2015





Several hospitals across the Commonwealth treated large numbers of patients with opioid-related diagnoses. In 2015, the hospitals that had the highest number of opioid-related discharges were Boston Medical Center, Massachusetts General Hospital, and UMass Memorial's University Campus.

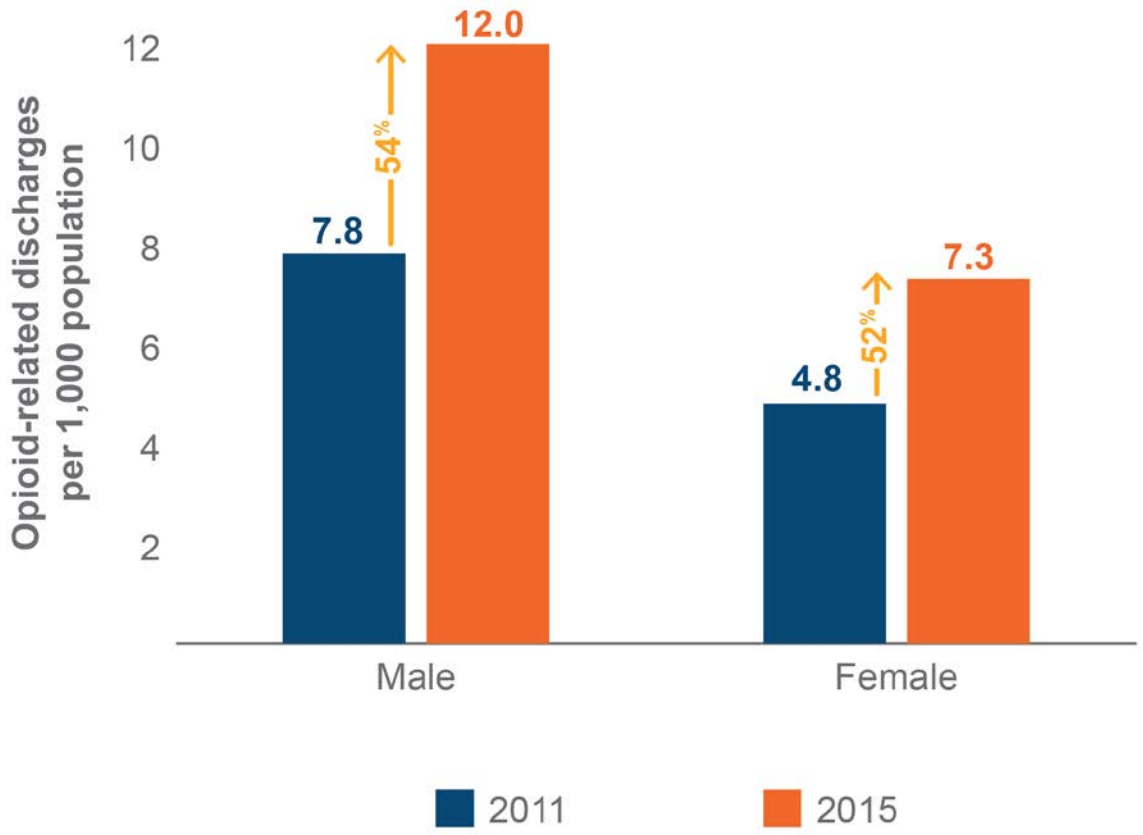
As seen in the bottom graph, many of these same hospitals (9 of the 15 in the top graph) also had a large number of opioid-related discharges *as a percentage of their overall discharge volume*. Hospitals with the highest proportion of opioid-related discharges were St. Elizabeth's (4.8% of its overall discharges), North Shore Union (3.5%) and Berkshire Medical Center and Boston Medical Center (3.4% each). On average, in 2015, roughly 2% of discharges from Massachusetts hospitals were opioid-related.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015

Notes: Hospitals with less than 50 opioid-related discharges were excluded from this analysis. 2015 data includes opioid-related discharges identified using only the patient's first 15 diagnoses. Two hospitals that specialize in behavioral health care (Mercy Medical Center Providence Behavioral Health Hospital Campus and Caritas Good Samaritan Medical Center Norcap Lodge Campus) were removed from this analysis.

HPC

Opioid-related hospital discharges, by gender, 2011 and 2015

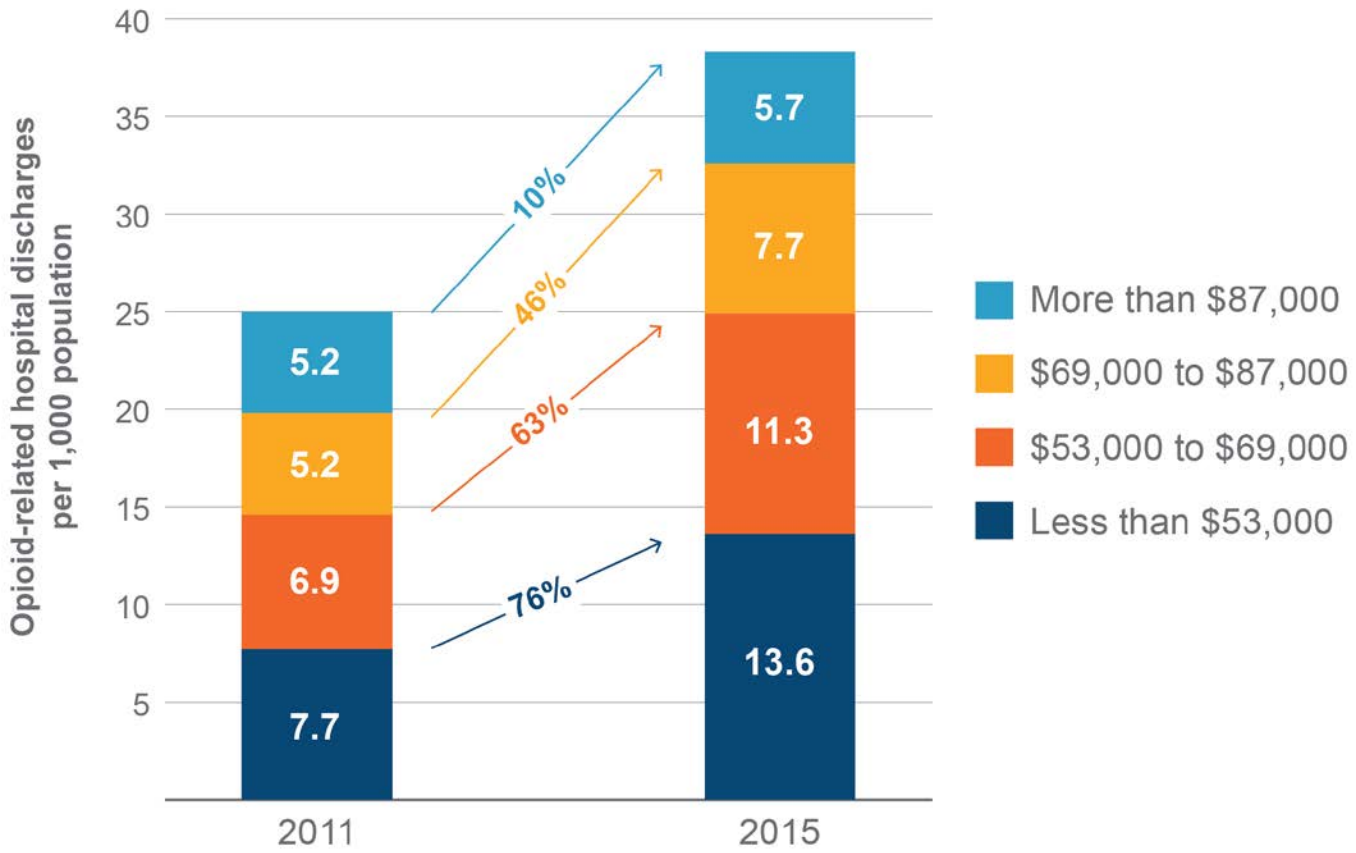


Males had a higher rate of opioid-related hospital discharges than females with 62% more in 2011 and 66% more in 2015.

From 2011 to 2015 both sexes experienced similar increases in their rate of opioid-related discharges per population, though males grew slightly faster at 54%, compared to 52% for females.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015
Notes: 2015 data includes opioid-related discharges identified only using the patient's first 15 diagnoses.

Opioid-related hospital discharges, by community income quartile, 2011 and 2015

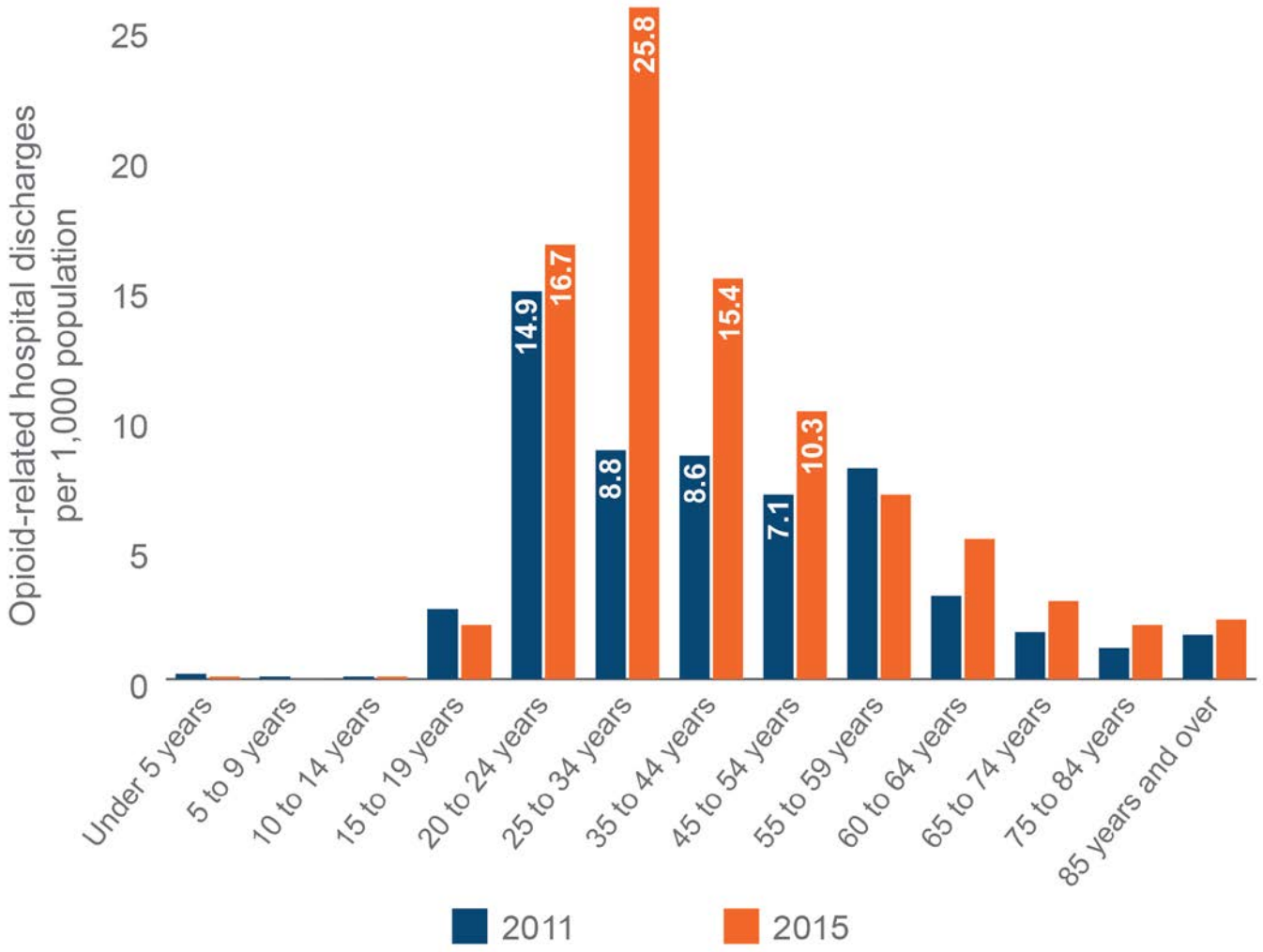


Residents living in the lowest-income areas of the state had the highest rate of opioid-related hospital discharges. Despite accounting for only 25% of the Commonwealth's population, residents living in the lowest-income areas of the state accounted for 36% of all opioid-related discharges in 2015.

From 2011 to 2015, communities in the bottom two income quartiles experienced the highest growth in the rate of opioid-related discharges: a 76% increase in communities with median income of less than $53,000 and a 63% increase for those with median income of $53,000-$69,000, compared to a 46% increase in communities with median income of $69,000-$87,000 and 10% increase in communities with median income of $87,000 or more.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015
Notes: 2015 data includes opioid-related discharges identified only using the patient's first 15 diagnoses.

Opioid-related hospital discharges, by age group, 2011 and 2015



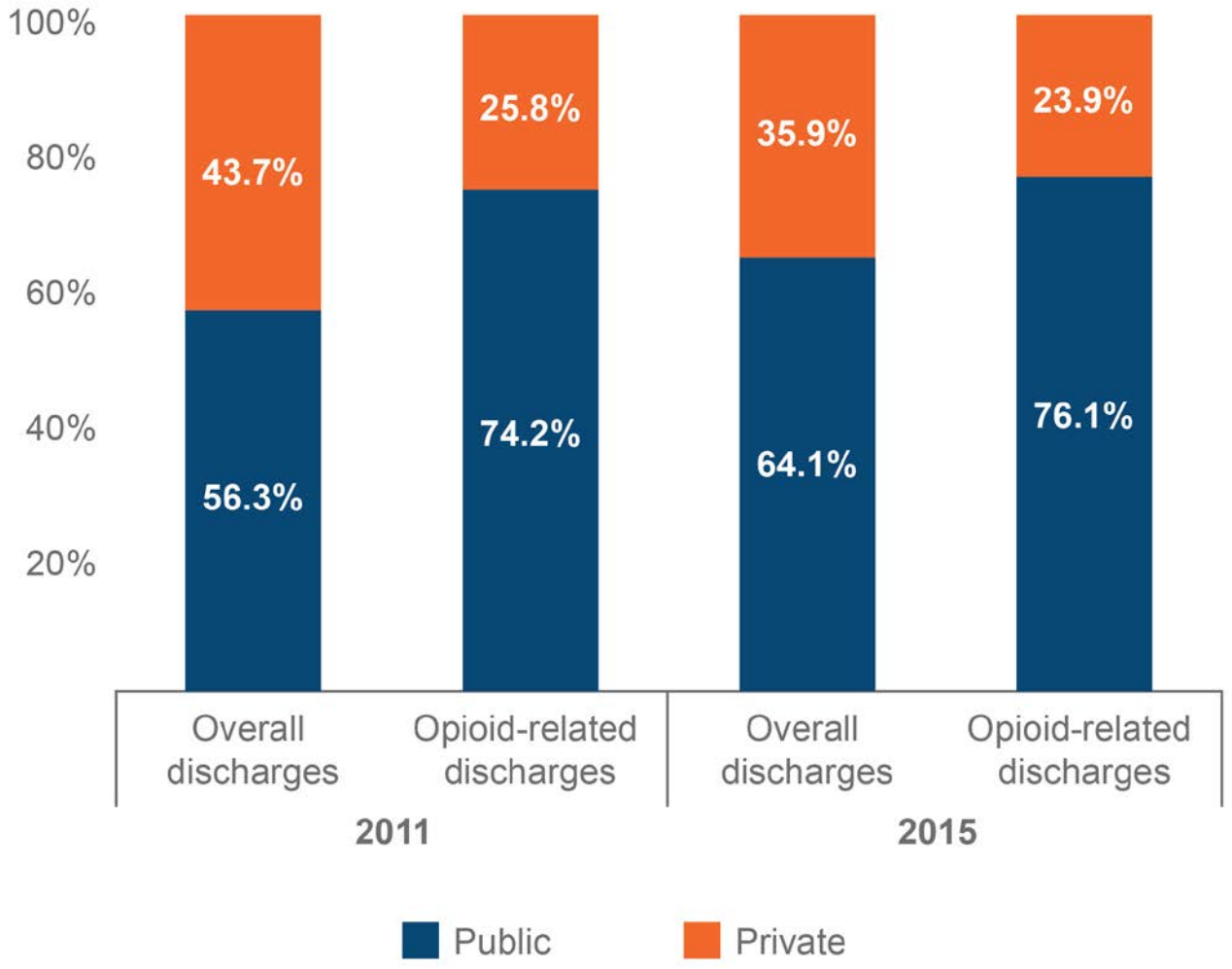
Despite accounting for only 34% of the Commonwealth's population, patients between the ages of 20 to 44 comprised the largest share of opioid-related hospital discharges in 2015 (70%). As shown in the graph, between 2011 and 2015, there was a shift in opioid-related discharges from patients in their early 20s to patients in their late 20s and early and late 30s. In 2011, patients aged 20 to 24 had the highest rate of opioid-related discharges (16.7 per 1,000 population). However, by 2015, patients aged 25 to 34 had the highest rate of opioid-related discharges (25.8 per 1,000 population), nearly a 200% increase for this age group.

Some age groups experienced declines in their rate of opioid-related hospital discharges between 2011 and 2015. Children 19 and under had a 23% decrease while adults between the ages of 55 and 59 had a 12% decrease.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015

Notes: 2015 data includes opioid-related discharges identified only using the patient's first 15 diagnoses. Age bins were chosen based on age breakdowns used by the American Community Survey.

Opioid-related hospital discharges, by primary payer, 2011 and 2015



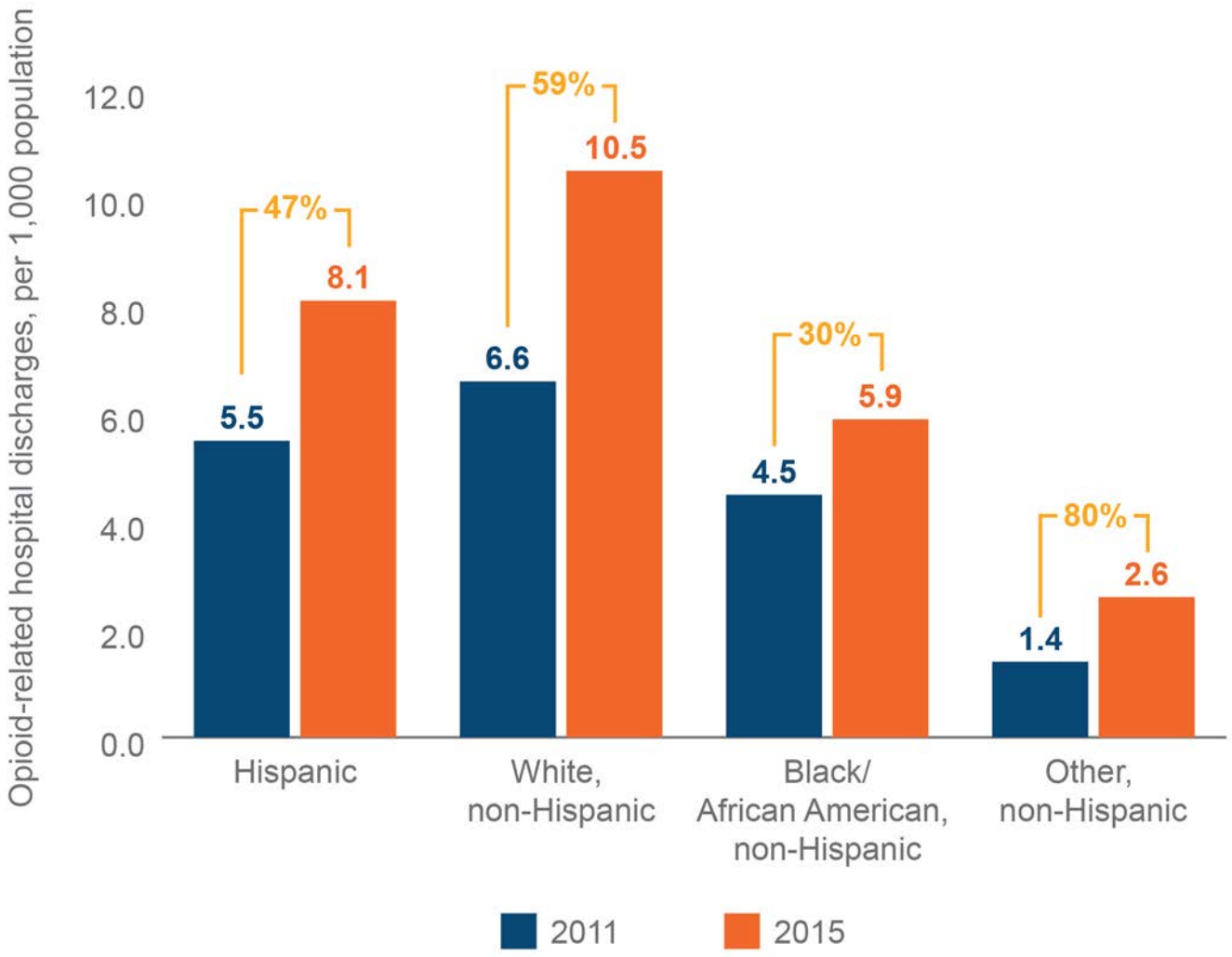
Public payers bear the overwhelming burden of opioid-related hospital discharges: in 2015 public payers covered 76% of opioid-related discharges, compared to 64% of overall discharges.

MassHealth in particular pays for a large share of opioid-related hospital discharges. Despite accounting for only 25% of the Commonwealth's population, MassHealth patients made up more than half (51%) of all opioid-related discharges in 2015.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015

Notes: 2015 data includes opioid-related discharges identified only using the patient's first 15 diagnoses. Public player includes Medicaid and Medicare; private includes all other payers.

Opioid-related hospital discharges, by race and ethnicity, 2011 and 2015



In 2015, non-Hispanic Whites had both the highest rate of opioid-related discharges (10.5 discharges per 1,000 population) and the highest growth rate since 2011 (59%), though other populations also had substantial growth. From 2011 to 2015, opioid-related discharges grew 47% among Hispanic residents and 30% among non-Hispanic Blacks/African Americans.

Source: HPC Analysis of the Center for Health Information and Analysis (CHIA), Hospital Inpatient Discharge and Emergency Department Databases, 2011 and 2015

Notes: 2015 data includes opioid-related discharges identified only using the patient's first 15 diagnoses. Other includes American Indian, Asian, and Native Hawaiian/Pacific Islanders.

Conclusion

This second annual analysis of the impact of the opioid epidemic on Massachusetts hospitals is meant to inform state policy to improve the ability of the health care system to address the needs of those affected by opioid use disorder. These findings demonstrate that, as of 2015, **opioid-related hospital utilization is growing across all racial, socioeconomic, geographic, gender, and most adult age groups**. The data show that **opioid-related discharges have increased in every region** of the state, **the most affected age group is now adults from 25 to 34**, and opioid-related discharges now account for **more than 3% of all discharges** at a number of hospitals in the state.

Consistent with the recommendations of Governor Baker's Opioid Working Group, these updated data also point to the growing need for improvements in the health care system, including expanded access to treatment and coordinated mental health and substance use disorder care.*

The HPC, along with EOHHS, DPH, CHIA, and the New England Neonatology Quality Improvement Collaborative, will release a special chart pack focused on trends in NAS later in 2017, as part of an interagency effort to systematically track trends in the opioid epidemic and its impact.

In addition to data analyses, the HPC continues to support efforts to address the opioid epidemic through investments, care delivery certification programs, and behavioral health-related research and evaluation projects.

*Recommendations of the Governor's Opioid Working Group, June 11, 2015. See recommendations 16, 17, 31.

Methodology

To report on opioid-related hospital discharges, HPC used the Center for Health Information and Analysis (CHIA) Hospital Inpatient Discharge and Emergency Department Database from 2011 to 2015 (10/1/2011- 9/30/2015).

Opioid-related discharges were identified using ICD-9 diagnosis codes designated by the Agency for Healthcare Research and Quality within the United States Department of Health and Human Services. Discharges with opioid-related diagnosis codes, primary or otherwise, were included in this analysis. These opioid-related diagnosis codes include: 304.00-304.03 (opioid type dependence), 304.70-304.73 (combinations of opioid type drug with any other drug dependence),305.50-305.53 (nondependent opioid abuse), 965.00 965.01, and 965.09 (poisoning by heroin, opium (alkaloids), and related narcotics), E850.0 and E850.2 (accidental poisoning by other opiates and related narcotics), E935.0 and E935.2 (heroin and other opiates causing adverse effects in therapeutic use). As with all analyses dependent on ICD-9 codes, provider coding may not always accurately reflect the patient's clinical condition. In particular, heroin-related codes are considered specific, but not necessarily sensitive. For example, some hospitals may only use heroin-related codes for cases of poisoning/overdose. As a result, some heroin abuse/dependence is likely captured in the "other opioids" category. Furthermore, some non-heroin-related opioid cases are likely captured in the "heroin-related" category.

From 2011 to 2014 the CHIA databases included only the patient's first 15 diagnosis codes. However, in 2015 all of a patient's diagnosis codes were included. An additional 1,300 inpatient stays with an 'other opioid' diagnoses were counted in 2015 due the expansion of codes available in the data, while fewer than 11 additional patients with heroin diagnoses were counted. The majority of the data presented here is based on the patient's 15 first diagnoses codes, with some noted exceptions.