CENTER FOR HEALTH INFORMATION AND ANALYSIS

Hospital Utilization in Massachusetts

An Assessment by Race & Ethnicity SFY 2021

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Technical Appendix

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Hospital Utilization in Massachusetts: An Assessment by Race & Ethnicity
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TECHNICAL APPENDIX

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Introduction

This technical appendix provides details on the methodology used for the report, *Hospital Utilization in Massachusetts: An Assessment by Race & Ethnicity, SFY 2021,* released by the Center for Health Information and Analysis (CHIA) in August 2023. This appendix details the data sources, methodology, and data categorization and grouping used in the report.

Data Sources

For this report, CHIA's Acute Hospital Case Mix Databases (Case Mix) were used as the source for most analyses. The Case Mix data comprises the Hospital Inpatient Discharge Database (HIDD), the Emergency Department Database (EDD), and the Outpatient Observation Database (OOD). The Case Mix data include encounter-level data that include patient socio-demographics, diagnostic information, treatment and service information, and hospital charges. The data are submitted to CHIA quarterly by all Massachusetts acute care hospitals and undergo a cleaning and verification process at CHIA that includes the feedback of verification reports to hospitals for confirmation of their information. Once quarterly data have been processed and verified, CHIA produces and makes available annual files. For general information about the Case Mix data, including an overview of each of the Case Mix databases, please see the Overview of the Massachusetts Acute Hospital Case Mix Databases and additional information about the Case Mix data on CHIA's website.

Data from the American Community Survey (ACS) 2021 5-Year Estimates (2017 – 2021) were used to produce estimates of the Massachusetts population by racial and ethnic group. For more information about the ACS, visit their website.

This report primarily reports on data from state fiscal year (SFY) 2021 (July 1, 2020 to June 30, 2021). Data from SFY 2019-2020 are also reported for select analyses within the report.

Methodology

This report focuses on two acute care settings – hospital inpatient and hospital emergency department – and returns to the acute care setting, as measured by readmissions and revisits.

Hospital Inpatient

For analyses of the hospital inpatient setting, measures reported include number of visits and average length of stay (ALOS) for racial and ethnic groups overall and by subpopulation within each racial and ethnic group. Length of stay is calculated by subtracting the admission date from the discharge date on each discharge record. Stays for which the admission and discharge dates are the same are marked as having a length of stay of 0. ALOS is the mean length of stay across discharge records for a particular category or group.

Hospital Emergency Department

For analyses about the hospital emergency department setting, measures reported include number of visits and excess length of stay (LOS) for racial and ethnic groups overall and by subpopulation within each racial and ethnic group. Excess LOS is a measure designed in consultation with clinicians to capture prolonged stays in the ED and is defined as a length of stay exceeding 4 hours. First, length of stay is calculated by subtracting the arrival date and time from the departure date and time of each visit. Visits for which the arrival and departure dates and times are the same (i.e., LOS of 0 hours) are excluded. Then, excess LOS is calculated by subtracting 4 from the calculated LOS;

visits with a remaining LOS greater than 0 are considered to have excess LOS. Visits with missing LOS are also missing excess LOS.

Readmissions

This report uses CHIA's adult all-payer all-cause unplanned hospital-wide readmission measure, adapted from the Yale/CMS hospital-wide readmission measure. A hospital readmission is defined as an admission to a hospital within 30 days of a prior inpatient discharge. CHIA's adult readmission measure excludes discharges for obstetric, primary psychiatric, cancer, or rehabilitative care, as well as discharges in which the patient left against medical advice. For detailed information on CHIA's adult readmission measure, visit the technical appendix for the most recent readmissions report.

Readmission measures included in this report are observed readmission rates and the average length of stay for discharges resulting in a readmission for racial and ethnic groups overall and by subpopulation within each racial and ethnic group. Readmission rates are calculated as the number of readmissions within 30 days divided by the number of eligible discharges for a particular category or group.

Revisits

This report also includes an analysis of 30-day revisits, which are defined as returns to the acute care setting through the emergency department within 30 days of a prior inpatient discharge. CHIA's revisit measure includes discharges for adults 18 years of age and older and excludes discharges for obstetric, cancer, or rehabilitative care, as well as discharges in which the patient left against medical advice. Discharges for primary psychiatric conditions are included in the analysis. For detailed information on CHIA's revisit measure, visit the technical appendix for the most recent revisits report.

Revisit measures included in this report are observed revisit rates for racial and ethnic groups overall and by subpopulation within each racial and ethnic group. Revisit rates are calculated as the number of revisits within 30 days divided by the number of eligible discharges for a particular category or group. The databook also includes the average length of stay for discharges resulting in a revisit.

Data Categorization and Grouping

Race/Ethnicity

Patient race and ethnicity is classified using a hierarchical grouping based on information entered by the facility. First, any patients of Hispanic/Latino/Spanish culture or origin regardless of race are classified as Hispanic of Any Race. Next, patients with valid primary race variables and who had only one race indicated are classified as non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Hispanic American Indian/Alaska Native, or non-Hispanic Native Hawaiian/Other Pacific Islander. Patients classified as Other Race or who had more than one race indicated are classified as non-Hispanic of Other or Multiple Races. Due to small population sizes, non-Hispanic American Indian/Alaska Native and non-Hispanic Native Hawaiian/Other Pacific Islander are reported together with non-Hispanic of Other or Multiple Races. Additionally, readmission and revisit measures are not reported for the non-Hispanic Other or Multiple Races group due to small population sizes. Discharges that could not be classified into any of the above groups due to missing or invalid race/ethnicity information are classified as Missing. Data for records missing race/ethnicity are not reported in analyses by race/ethnicity.

Age Group

Age in years is calculated by subtracting the admission date from the patient's date of birth. Records for which date of birth is missing or invalid, or with a calculated age exceeding 115 years are excluded. Age is then grouped into three categories, where applicable: 0-17, 18-64, and 65 and older. Data for records missing age are not reported in analyses by age.

Sex

Patient sex is presented as submitted by the hospital on the record: male, female, or unknown. Data for records with missing or unknown sex are not reported in analyses by sex.

Payer Type

Payer type categories are created by grouping payer source codes on the record. Payer type categories are grouped as follows:

- **Medicare:** Expected primary payer source is fee-for-service Medicare or managed care Medicare
- **Medicaid:** Expected primary payer source is MassHealth, including Medicaid managed care, or Commonwealth Care
- **Commercial:** Blue Cross and Blue Cross Managed Care, Commercial Insurance and Commercial Managed Care, HMO, PPO/Other managed care plans not elsewhere classified, point-of-service plans, exclusive provider organizations, and other non-managed care plans

Other payer sources are not included in payer type analyses. These include: Self-pay, Free Care, and Health Safety Net, Worker's Compensation, Other Government Payment, Auto Insurance, Dental Plans, and None (for Secondary Payer). Additionally, data for records missing payer information are not reported in analyses by payer type.

Behavioral Health

For analyses on behavioral health, records were categorized into clinically meaningful categories based on the diagnoses listed on the record. For the inpatient setting, both primary and secondary diagnoses are used. For the emergency department setting, only primary diagnoses are used. For readmissions, secondary diagnoses on the eligible discharge and any diagnoses on inpatient records from the past 12 months are used.

CHIA uses the Agency for Healthcare Research and Quality (AHRQ) Clinical Classifications Software-Refined (CCSR) for ICD-10-CM within the Mental, Behavioral, and Neurodevelopmental Disorders chapter to identify behavioral health-related conditions. Diagnoses are first assigned to a CCSR category. CCSR categories are then rolled up into two broad categories: mental health (which includes mood, anxiety, adjustment, suicide, schizophrenia, personality, impulse and other mental health disorders) and substance use (which includes alcohol, cannabis, opioids, cocaine, sedatives, stimulants, hallucinogens and other substance use disorders). Records with any mental health or substance use disorders as defined above are considered to have a behavioral health condition.

For a complete list of the ICD-10 and CCSR categories used to define behavioral health in this report, see the technical appendices for the Massachusetts Acute Care Hospital Inpatient Discharge Data FFY 2016-2021, the Massachusetts Acute Care Hospital Emergency Department Data FFY 2016-2019, and the Behavioral Health & Readmissions in Massachusetts Acute Care Hospitals SFY 2020.