

CENTER FOR HEALTH INFORMATION AND ANALYSIS



# Performance of the Massachusetts Health Care System

TECHNICAL APPENDIX

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Annual Report



## Provider and Health System Trends



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# Provider and Health System Trends

## TECHNICAL APPENDIX

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# Hospital Utilization

## Notes on Case Mix Databases

### Overview

For this report, the Hospital Inpatient Discharge Database (HIDD), Emergency Department Database (EDD) and Outpatient Observation Database (OOD) of CHIA's Acute Hospital Case Mix Databases were used as the data sources for reporting on trends in acute hospital utilization. The HIDD, EDD and OOD are stay- and visit-level files including 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 CHIA's 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](#).

### Hospital Inpatient Discharge Database (HIDD)

This data source is used for reporting on acute hospital inpatient discharges. Data from the HIDD for Federal Fiscal Year (FFY) 2024 (October 2023 to September 2024) are not considered final and are subject to change. Please see the [CHIA website](#) for the most up-to-date information on inpatient utilization.

### Emergency Department Database (EDD)

This data source was used for reporting on treat-and-release emergency department (ED) visits in acute hospitals. Treat-and-release ED visits are those ED visits not resulting in an inpatient admission or outpatient observation stay. Several hospitals resubmitted data from FFY 2023 through March 2024 to reclassify certain ED visits. Emergency visit data from these hospitals have been reclassified to observation data for visits that began in the emergency department but ended in an outpatient observation stay. Data from the EDD for FFY 2024 (October 2023 to September 2024) are not considered final and are subject to change. Please see the [CHIA website](#) for the most up-to-date information on ED utilization.

### Outpatient Observation Database (OOD)

This data source was used for reporting on outpatient observation visits in acute hospitals. Outpatient observation visits include only those visits that did not result in an inpatient admission. Several hospitals resubmitted data from FFY 2023 through March 2024 to reclassify certain ED and outpatient observation visits. Observation visit data from these hospitals now include visits that began in the emergency department but ended in an outpatient observation stay. Data from the OOD for FFY 2024 (October 2023 to September 2024) are not considered final and are subject to change. Please see the [CHIA website](#) for the most up-to-date information on observation utilization.

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## Case Mix Data Categorizations and Groupings

### Length of Stay

Inpatient length of stay (LOS) was calculated by subtracting the admission date from the discharge date. Stays for which the admission and discharge dates were the same were coded as having a LOS of 0 days. Average length of stay (ALOS) is an aggregate measure of the mean LOS within a certain category or group. No outliers were removed when calculating the LOS or ALOS. The number of inpatient discharges with missing LOS due to missing date of admission or discharge was 8 in FFY 2019, 1 in FFY 2020, 8 in FFY 2021, 7 in FFY 2022, 8 in FFY 2023 and 9 in FFY 2024.

ED LOS was calculated by subtracting the arrival date and time from the departure date and time and is reported in hours. ALOS is an aggregate measure of the mean LOS within a certain category or group. Five outlier months were removed when calculating the length of stay including April 2019 at Tufts Medical Center, March 2020 at Brigham and Women's Hospital, January 2022 at Sturdy Memorial Hospital, May 2023 at Metrowest Hospital, and May 2023 at Saint Vincent's Hospital. The number of visits with missing length of stay due to missing date and/or time of arrival or departure, or invalid data was 51 in FFY 2019, 37 in FFY 2020, 138 in FFY 2021, 111 in FFY 2022, 142 in FFY 2023, and 323 in FFY 2024.

Exclusions due to invalid data included:

- Twelve hospital-quarters with 90% or more departure times equal to zero
- Twenty-four hospital-quarters with 100% of visits with arrival time exactly equal to departure time

Outpatient LOS was calculated by subtracting the arrival date and time from the departure date and time and is reported in hours. ALOS is an aggregate measure of the mean LOS within a certain category or group. The number of outpatient observation visits with missing LOS due to missing date and/or time of arrival or departure, or invalid data, was 191 in FFY 2019, 218 in FFY 2020, 377 in FFY 2021, 304 in FFY 2022, 171 in FFY 2023, and 771 in FFY 2024.

# Hospital and Health System Financial Performance

## Description of Financial Metrics

Financial ratio analysis is one critical component of assessing an entity's financial condition. These measures are used for hospitals and their affiliated health systems.

### Profitability

This category evaluates the ability of an entity to generate a surplus.

#### Operating Margin

Operating income is income from normal operations of an entity, including patient care and other activities, such as research, gift shops, parking, and cafeteria, minus the expenses associated with such activities. Operating Margin is a critical ratio that measures how profitable the entity is when looking at the performance of its primary activities. These margins include COVID-19 relief funding reported as operating revenue.

Operating Margin = (Total Operating Revenue – Total Expenses Including Nonrecurring Gains or Losses) / Total Unrestricted Revenue, Gains and Other Support

#### Non-Operating Margin

Non-operating income includes items that are not related to operations, such as investment income, contributions, gains from the sale of assets and other unrelated business activities.

Non-Operating Margin = Total Non-Operating Revenue / Total Unrestricted Revenue, Gains and Other Support

#### Total Margin

This ratio evaluates the overall profitability of the entity using both operating surplus (or loss) and non-operating surplus (or loss). These margins include COVID-19 relief funding reported as operating revenue.

Total Margin = Total Excess of Revenue, Gains and Other Support Over Expenses / Total Unrestricted Revenue, Gains and Other Support

### Other Measures

The following are individual line items from the Standardized Financial Filing.

- **Net Patient Service Revenue (NPSR):** Revenue an entity would expect to collect for services provided, including premium revenue, less contractual allowances. NPSR is the primary source of revenue for an entity.
- **Other Operating Revenue:** Includes revenue from services other than health care provided to patients, as well as sales and services to non-patients.
- **Federal COVID-19 Relief Funds:** Total funds an entity received related to the COVID-19 pandemic from federal sources that were reported as operating revenue.

- **State & Other COVID-19 Relief Funds:** Total funds an entity received related to the COVID-19 pandemic from state or other sources, such as private grants or contributions, that were reported as operating revenue.
- **Total Expenses:** Includes all expenses reported by the entity, including but not limited to salary and benefits, depreciation, interest, health safety net assessment, and other operating expenses.

## General Data Caveats

### Data Sources

Acute hospital and hospital health system financial data is drawn from the CHIA Annual Standardized Financial Filings submitted by the health system. Standardized Financial Filings may not reflect all of the financial resources available to the entity, such as resources available through associations with foundations or parents/affiliates. Financial information must be interpreted within the context of other factors, including, but not limited to, management plans, payment changes, market behavior and other factors affecting performance.

Profitability percentages may not add due to rounding.

### Annual Reporting

Annual financial performance reports display twelve months of financial data for each health system and acute hospital regardless of an entity's fiscal year end date. Most entities' fiscal year end is September 30, with the exception of Steward Health Care, Trinity Health, Cambridge Health Alliance, Tenet Healthcare, and Shriners Hospitals for Children. Steward Health Care, Tenet Healthcare, and Shriners Hospitals for Children have a fiscal year end of December 31. Trinity Health and Cambridge Health Alliance have a fiscal year end of June 30.

### Data Caveats

Steward Health Care's system level data are not included in HFYs 2019, 2021, 2022, or 2023 as they did not submit audited or standardized financial statements those years. In HFY 2020 they did not submit audited or standardized financial statements, but their data was derived from a publicly available source and is included. Additionally, Steward Health Care did not report any of the COVID-19 relief funding received by their eight hospitals in HFY 2020 as operating revenue. After obtaining the publicly available audited financial statements, their HFY 2020 data was revised by CHIA to include the Provider Relief Funds reported by each of the hospitals in their operating revenue.

Heywood Healthcare's HFYs 2021, 2022, and 2023 audited financial statements were not available in time for this publication and therefore Heywood Healthcare system, hospitals, and physician organization data are based on standardized financial data submitted.

Beth Israel Lahey Health became financially consolidated in March 2019. Due to this, seven months of financial data was reported for the system and its affiliated hospitals and physician organizations representing the period from March 1 through September 30, 2019. For comparative purposes, its HFY 2019 revenue and expenses were annualized to represent 12 months of data in the aggregate operating revenue and expense trends.

# Nursing Facility Utilization and Financial Performance

## Data Source

The data underlying the metrics in the nursing facility-related slides is from the Nursing Facility Cost Reports (HCF-1 in 2019 and 2020; SNF-CR in 2021-2023) submitted to CHIA for each calendar year 2019-2023.

## Nursing Facility Annual Occupancy Rates, System Level

### Occupancy Rate

This metric measures the proportion of all nursing facility beds that were filled during the year.

**Total Resident Days** (2019, 2020 HCF-1) = Grand Annual Total Patient Days (Account R01000)

**Total Resident Days** (2021-2023 SNF-CR) = Total Patient Days (Schedule 9, Column 15, Line 200)

**Mean Licensed Beds** = Mean Licensed Beds Level 1 + Mean Licensed Beds Level 2 + Mean Licensed Beds Level 3 + Mean Licensed Beds Level 4

$$\text{Occupancy} = \frac{\text{Total Resident Days}}{\text{Mean Licensed Beds} * \text{Days in Cost Report Year}}$$

## Total Facilities, Total Beds, and Median Occupancy by County, 2023

### Total Facilities, 2023

This metric counts the number of nursing facilities required to submit a 2023 cost report to CHIA, total and in each county.

### Licensed Beds, 2023

This metric counts the number of licensed beds in nursing facilities required to submit a 2023 cost report to CHIA, total and in each county, as of 12/31/2023.

### Median Occupancy Rate, 2023

For this metric, the occupancy rate was calculated for each facility as described above, and the median value was determined, across all facilities and in each county.