

Performance of the Massachusetts Health Care System

Provider and Health
System Trends

Technical Appendix March 2022

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 Databases (HIDD) and Emergency Department Databases (EDD) of CHIA's Acute Hospital Case Mix Databases were used as one of the data sources. The HIDD is a stay-level file including patient socio-demographics, diagnostic information, treatment and service information, and hospital charges. 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)

Data from the HIDD for Federal Fiscal Year (FFY) 2021 (October 2020 to September 2021) are not considered final and are subject to change. Data for a small number of acute care hospitals were not available at the time of this publication. Hospitals with no data reported for select months accounted for 5.9% of total inpatient volume for FFY 2019 and 2020 and include: Sturdy Memorial Hospital (October 2020 to September 2021) and Beth Israel Deaconess Medical Center (July 2021 to September 2021). Please see the CHIA website (<https://www.chiamass.gov/massachusetts-acute-care-hospital-inpatient-discharge-reporting/>) for the most up-to-date information on inpatient utilization.

Emergency Department Databases (EDD)

Data from the EDD for FFY 2021 (October 2020 to September 2021) are not considered final and are subject to change. Data for one acute care hospital were not available at the time of this publication. Sturdy Memorial Hospital has no data reported for October 2020 to September 2021; this hospital accounted for 1.6% of total ED volume in FFY 2019 and 2020. Please see the CHIA website (<https://www.chiamass.gov/chia-releases-report-on-hospital-emergency-department-data/>) for the most up-to-date information on ED utilization.

Case Mix Data Categorizations and Groupings

COVID-19

A hospital visit was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19 and a date of admission on or after April 1, 2020, or a primary or secondary diagnosis of other (not SARS-associated) coronavirus and a date of admission on or before March 31, 2020. Starting January 1, 2021, an additional ICD-10-CM code was added for pneumonia due to coronavirus disease 2019 (J12.82).

ICD-10 CODE	DESCRIPTION
U07.1	COVID-19, virus identified (laboratory confirmed)
U07.2	COVID-19, virus not identified (clinically diagnosed)
B97.29*	Other coronaviruses as the cause of disease classified elsewhere
J12.82	Pneumonia due to coronavirus disease 2019

*If the date of admission was on or before March 31st, 2020.

Payer Type

Payer type is the expected primary payer on the discharge as reported by the hospital. For this analysis, payer type categories were derived from payer source codes. Payer type categories were assigned to one of four categories as follows:

- Medicare: Fee-for-service Medicare or managed care Medicare
- Medicaid: 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: Self-Pay (Self-pay, Free Care and Health Safety Net), Worker's Compensation, Other Government Payment, Auto Insurance, and Dental Plans

Discharge Setting

For this analysis, discharge setting information reported by the facility was classified into one of seven mutually exclusive categories:

- **Home:** Home or self-care, rest home, or shelter
- **Skilled Nursing Facility (SNF):** Skilled nursing facilities
- **Home with Home Health Agency Care (HHA):** Home under care of organized home health service organization or home under care of a home IV drug therapy provider
- **Hospice:** Home hospice care or hospice medical facility
- **Rehabilitation:** Intermediate care facility, inpatient rehabilitation facility, rehabilitation hospital, or Medicare-certified long-term care hospital
- **Expired:** Died in hospital
- **Other:** Critical access hospital, psychiatric hospital, federal healthcare facility, another short-term general hospital for inpatient care, another type of institution not defined elsewhere, or other discharge setting

Notes on Hospital Cost Report Data

Overview

The Massachusetts Hospital Cost Reports were used to calculate the median percent change in outpatient visits for acute hospitals. The Hospital Cost Report is submitted each year by hospitals and contains data on costs, revenues, and utilization statistics. Hospitals are required to submit based on the same time frames as the Medicare 2552 Cost Report filing schedules, which reflects the unique fiscal year end of each hospital.

Data Caveats

Outpatient visits are the total outpatient visits reported by the hospital, including but not limited to emergency department, clinic, and observation visits. Outpatient visits may not be uniformly reported across hospitals.

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. A negative surplus, or loss, is usually a sign of financial difficulty.

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. In HFY 2020, 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

Total Margin

This ratio evaluates the overall profitability of the entity using both operating surplus (or loss) and non-operating surplus (or loss). In HFY 2020, 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 from federal sources related to the COVID-19 pandemic that were reported as operating revenue.
- **State & Other COVID-19 Relief Funds:** Total funds an entity received from the state or other sources, such as private grants or contributions, related to the COVID-19 pandemic 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.

Hospital Type Definitions

Academic medical centers (AMCs) are a subset of teaching hospitals. AMCs are characterized by (1) extensive research and teaching programs; (2) extensive resources for tertiary and quaternary care; (3) are principal teaching hospitals for their respective medical schools; and (4) are full service hospitals with case mix intensity greater than 5% above the statewide average.

Teaching hospitals are those hospitals that report at least 25 full-time equivalent medical school residents per one hundred inpatient beds in accordance with Medicare Payment Advisory Commission (MedPAC) and do not meet the criteria to be classified as AMCs.

Community hospitals are hospitals that do not meet the 25 full-time equivalent medical school residents per one hundred beds criteria to be classified as teaching hospitals and have a public payer mix of less than 63%.

Community-High Public Payer (HPP) hospitals are community hospitals that are disproportionately reliant upon public revenues by virtue of a public payer mix of 63% or greater. Public payers include Medicare, MassHealth and other government payers including the Health Safety Net.

Specialty hospitals are not included in any cohort comparison analysis due to the unique patient populations they serve and/or the unique sets of services they provide. However, specialty hospitals are included in all statewide median calculations.

Note: Some AMCs and teaching hospitals have HPP status. For HFY 2020, hospitals are assigned based on data reported in the FY 2019 Massachusetts Hospital Cost Report.

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 system level data for HFY 2018 and 2020 included in this report was derived from publicly available audited financial statements that were standardized by CHIA using the same method as the other health

systems. Additionally, Steward Health Care did not report any of the COVID relief funding received by their eight hospitals 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.

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) submitted to CHIA in each calendar year 2018-2020.

Nursing Facility Utilization, by Payer Type

Nursing Facility Resident Days

This metric measures the distribution of resident days by payer type: Medicaid, Medicare, Self-Pay, Commercial, other public programs, and other payer types. To compute adjusted resident days by payer type, each facility's total resident days for a given payer type within a given year were divided by the number of operating days multiplied by the number of days in that calendar year.

Medicaid = [Ma Medicaid Non-managed Care Grand Annual Total Patient Days R85300] + [Ma Medicaid Managed Care Grand Annual Total Patient Days R85350] + [SCO and PACE Grand Annual Total Patient Days R85400]

Medicare = [Medicare Non-managed Care Grand Annual Total Patient Days R85200] + [Medicare Managed Care Grand Annual Total Patient Days R85250]

Self-Pay = Self Pay Grand Annual Total Patient Days R85050

VA, DTA, and Other Public Payers = VA DTA Other Public Grand Annual Total Patient Days R85500

Commercial = [Non-Managed Care Grand Annual Total Patient Days R85150] + [Managed Care Grand Annual Total Patient Days R85100]

Non-MA Medicaid = Non Ma Medicaid Grand Annual Total Patient Days R85450

Other = Other Grand Annual Total Patient Days R85550

Nursing Facility Occupancy Rates

Occupancy Rate

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

Mean Operating Beds = Mean Operating Beds Level 1 + Mean Operating Beds Level 2 + Mean Operating Beds Level 3 + Mean Operating Beds Level 4

Occupancy =
$$\frac{\text{Total Patient Days R01000}}{\text{Mean Operating Beds} * \text{Days in Cost Report Year}}$$

Total Facilities, Total Operating Beds, and Occupancy by County, 2020

Total Facilities, 2020

This metric counts the number of nursing facilities which submitted a 2020 cost report to CHIA, total and in each county.

Total Operating Beds, 2020

This metric counts the number of operating beds in nursing facilities which submitted a 2020 cost report to CHIA, total and in each county.

Median Occupancy Rate, 2020

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.

Nursing Facility Median Total Margin

Median Total Margin

Total margin measures the nursing facility's financial performance across all of its income and expenses. The total margin was calculated for each nursing facility, then the 75th percentile, median, and 25th percentile were determined across all facilities.

Total Revenue = Total Gross Income R30000

Total Expenses = Total Operating Expenses R40000

Total Margin = $\frac{\text{Total Revenue} - \text{Total Expenses}}{\text{Total Revenue}}$

Nursing Facility Total Revenue and Expenses

Nursing facility total revenue and expenses are aggregate measures across all nursing facilities which submitted a cost report to CHIA for the given reporting year. To compute adjusted total revenue and total expenses, each facility's total revenue and expenses within a given year were divided by the number of operating days multiplied by the number of days in that calendar year.

Total Revenue = Total Gross Income R30000

Total Expenses = Total Operating Expenses R4000