

CENTER FOR HEALTH INFORMATION AND ANALYSIS

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**MASSACHUSETTS  
HOSPITAL  
PROFILES**

TECHNICAL APPENDIX

DATA THROUGH  
FISCAL YEAR 2015

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# Acute Hospitals

Acute and non-acute hospitals included in *Massachusetts Hospital Profiles - Data through Fiscal Year 2015* were profiled on service, payer mix, quality, utilization, revenue, and financial performance. Details for each of these metrics are included in this technical appendix.

The Center for Health Information and Analysis (CHIA) relied on the following primary data sources to present information: the Hospital Cost Report, the Hospital Discharge Database (HDD), and the Hospital Standardized Financial Statement database.

Unless otherwise noted, metrics included in this report are based on data reported by acute and non-acute hospitals from Fiscal Year (FY) 2011 to FY2015. Descriptive acute and non-acute hospital information is from FY2015.

## **Hospital Cost Report:**

The Hospital Cost Report is submitted each year by acute and non-acute hospitals and contains data on costs, revenues, and utilization statistics. For FY2014 and earlier, acute hospitals were required to complete the Cost Report based on a fiscal year end of September 30 regardless of their actual fiscal year end. Beginning in FY2015, the new Hospital Cost Report requires hospitals 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.

## **Hospital Discharge Database (HDD):**

HDD data is submitted quarterly by acute hospitals and contains patient-level data identifying charges, days, and diagnostic information for all acute inpatient discharges. CHIA used FY2015 HDD data for the service metrics, which includes discharges between October 1, 2014 and September 30, 2015 for all acute hospitals.

## **Hospital Standardized Financial Statements:**

The Hospital Standardized Financial Statements are submitted quarterly and annually by acute hospitals based on their individual fiscal year end. The Standardized Financial Statements contain information on the hospital's assets, liabilities, revenues, expenses, and profits or losses. They reflect only the hospital's financial information; they do not reflect financial information for any larger health system with which a hospital may be affiliated.

## **Audited Financial Statements:**

Audited Financial Statements are submitted annually by hospitals (or their parent organizations, if applicable). In addition to the financial figures that are found in the Hospital Standardized Financial Statements, the Audited Financial Statements contain an opinion from an independent auditor as well as notes from hospital or system management that elaborate on the financial performance and standing of the hospital or system during the fiscal year.

## **Quality Data Sources:**

To compile the hospital quality measures, CHIA relied on the following primary data sources: HDD, the Centers for Medicare & Medicaid Services (CMS) Hospital Compare database, and The Leapfrog Group.

## **Data Verification:**

Each year's Hospital Cost Report, hospital and multi-acute hospital system financial statements, Relative Price, and quality data reports were verified in accordance with respective reporting regulation requirements. Additional data verification forms that included each hospital's reported financial data were sent to each acute and non-acute hospital for FY2011-FY2015.

# Acute Hospitals

An **acute hospital** is a hospital that is licensed by the Massachusetts Department of Public Health and contains a majority of medical-surgical, pediatric, obstetric, and maternity beds.

## Multi-Acute Hospital System Affiliation and Location

Massachusetts hospitals are generally affiliated with a larger health system. Health systems may include multiple hospitals and/or provider organizations while others may have only one hospital with associated providers or provider organizations. Multi-acute hospital system membership identifies those health systems with more than one acute hospital. This information was derived from Audited Financial Statements.

Below is a list of Massachusetts multi-acute hospital systems and their acute hospital members as of the end of each system's fiscal year 2015:

Multi-Acute Hospital System	Acute Hospital Member
<b>Baystate Health</b>	Baystate Franklin Medical Center Baystate Mary Lane Hospital Baystate Medical Center Baystate Noble Baystate Wing Hospital
<b>Berkshire Health Systems</b>	Berkshire Medical Center Fairview Hospital
<b>Cape Cod Healthcare</b>	Cape Cod Hospital Falmouth Hospital
<b>CareGroup</b>	Beth Israel Deaconess Hospital – Milton Beth Israel Deaconess Hospital – Needham Beth Israel Deaconess Hospital – Plymouth Beth Israel Deaconess Medical Center Mount Auburn Hospital New England Baptist Hospital
<b>Heywood Healthcare</b>	Athol Hospital Heywood Hospital
<b>Kindred Healthcare<sup>^</sup></b>	Kindred Hospital – Boston Kindred Hospital – Boston North Shore
<b>Lahey Health System</b>	Lahey Hospital & Medical Center Northeast Hospital Winchester Hospital
<b>Partners HealthCare System</b>	Brigham and Women's Hospital Brigham and Women's Faulkner Hospital Cooley Dickinson Hospital Martha's Vineyard Hospital Massachusetts General Hospital Nantucket Cottage Hospital Newton-Wellesley Hospital North Shore Medical Center
<b>Shriners Hospitals for Children<sup>^</sup></b>	Shriners Hospitals for Children – Boston Shriners Hospitals for Children – Springfield
<b>Steward Health Care System</b>	Morton Hospital Nashoba Valley Medical Center Steward Carney Hospital Steward Good Samaritan Medical Center Steward Holy Family Hospital Steward Norwood Hospital Steward Saint Anne's Hospital Steward St. Elizabeth's Medical Center

# Acute Hospitals

<b>UMass Memorial Health Care</b>	Clinton Hospital HealthAlliance Hospital Marlborough Hospital UMass Memorial Medical Center
<b>Wellforce</b>	Lowell General Hospital Tufts Medical Center
<b>Tenet Healthcare<sup>^</sup></b>	MetroWest Medical Center Saint Vincent Hospital

<sup>^</sup> Kindred Healthcare, Inc., Tenet Healthcare Corporation, and Shriners Hospitals for Children are multi-state health systems with a large presence outside of Massachusetts. Each owns two acute hospitals in Massachusetts (Kindred owns Kindred Hospital – Boston and Kindred Hospital – Boston North Shore; Tenet owns MetroWest Medical Center and Saint Vincent Hospital; Shriners owns Shriners Hospitals for Children – Boston and Shriners Hospitals for Children - Springfield).

## Regional Definitions

The location for each acute hospital in this report was obtained, where possible, from hospital licensing information collected by the Massachusetts Department of Public Health (DPH). The hospital license includes information on a hospital's campuses and satellite offices.

The geographic regions presented in this report are derived from the Health Policy Commission (HPC) static geographic regions.<sup>1</sup> The HPC regions were rolled up into larger regions for this publication to facilitate better comparison within each geographic area. The acute hospitals and the regions to which they were assigned are:

Massachusetts Region	Acute Hospital Assigned to Region
<b>Metro Boston</b>	Beth Israel Deaconess Hospital – Milton Beth Israel Deaconess Hospital – Needham Beth Israel Deaconess Medical Center Boston Children's Hospital Boston Medical Center Brigham and Women's Faulkner Hospital Brigham and Women's Hospital Cambridge Health Alliance Dana-Farber Cancer Institute Hallmark Health Kindred Hospital- Boston Massachusetts Eye and Ear Infirmary Massachusetts General Hospital Mount Auburn Hospital New England Baptist Hospital Newton-Wellesley Hospital Shriners Hospitals for Children – Boston Steward Carney Hospital Steward St. Elizabeth's Medical Center Tufts Medical Center
<b>Northeastern Massachusetts</b>	Anna Jaques Hospital Emerson Hospital Kindred Hospital- Boston North Shore Lahey Hospital & Medical Center Lawrence General Hospital Lowell General Hospital

<sup>1</sup> For descriptions of the regions, see <http://www.mass.gov/anf/docs/hpc/2013-cost-trends-report-technical-appendix-b3-regions-of-massachusetts.pdf> (last accessed March 7, 2017).

# Acute Hospitals

	<p>Nashoba Valley Medical Center          North Shore Medical Center          Northeast Hospital          Steward Holy Family Hospital          Winchester Hospital</p>
<b>Central Massachusetts</b>	<p>Athol Hospital          Clinton Hospital          Harrington Memorial Hospital          HealthAlliance Hospital          Heywood Hospital          Saint Vincent Hospital          UMass Memorial Medical Center</p>
<b>Cape and Islands</b>	<p>Cape Cod Hospital          Falmouth Hospital          Martha's Vineyard Hospital          Nantucket Cottage Hospital</p>
<b>Metro West</b>	<p>Marlborough Hospital          MetroWest Medical Center          Milford Regional Medical Center          Steward Norwood Hospital          Sturdy Memorial Hospital</p>
<b>Western Massachusetts</b>	<p>Baystate Franklin Medical Center          Baystate Mary Lane Hospital          Baystate Medical Center          Baystate Noble Hospital          Baystate Wing Hospital          Berkshire Medical Center          Cooley Dickinson Hospital          Fairview Hospital          Holyoke Medical Center          Mercy Medical Center          Shriners Hospitals for Children – Springfield</p>
<b>Metro South</b>	<p>Beth Israel Deaconess Hospital – Plymouth          Morton Hospital          Signature Healthcare Brockton Hospital          South Shore Hospital          Steward Good Samaritan Medical Center</p>
<b>Southcoast</b>	<p>Steward Saint Anne's Hospital          Southcoast Hospitals Group</p>

# Acute Hospitals

## Special Designations

Certain acute hospitals in Massachusetts have a special status among public payers due to their rural or relatively isolated locations:

**Critical Access Hospital** is a state designation given to hospitals that have no more than 25 acute beds, are located in a rural area, and are more than a 35-mile drive from the nearest hospital or more than a 15-mile drive in areas with mountainous terrains or secondary roads.<sup>2</sup> Critical Access Hospitals receive cost-based payments from Medicare and MassHealth.

**Sole Community Hospital** is a Medicare designation given to hospitals that are located in rural areas or are located in areas where it is difficult to access another hospital quickly. These hospitals are eligible to receive higher inpatient payments from Medicare than other hospitals.<sup>3</sup>

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<sup>2</sup> In addition, Critical Access Hospitals include hospitals that were, prior to January 1, 2006, designated by the State as a "necessary provider" of health care services to residents in the area. There are additional requirements to be designated as a Critical Access Hospital, including length of stay requirements, staffing requirements, and other provisions. See Code of Federal Regulations: 42 CFR 485.601-647.

<sup>3</sup> Code of Federal Regulation: 42 CFR 412.92.

# Acute Hospital Cohorts

In order to develop comparative analytics, CHIA assigned hospitals to peer cohorts. The acute hospitals were assigned to one of the following cohorts according to the criteria below:

**Academic Medical Centers (AMCs)** are a subset of teaching hospitals. AMCs are characterized by (1) extensive research and teaching programs and (2) extensive resources for tertiary and quaternary care, and are (3) principal teaching hospitals for their respective medical schools and (4) 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 are not teaching hospitals and have a public payer mix of less than 63%.

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

**Specialty hospitals** are not included in any cohort comparison analysis due the unique patient populations they serve and/or the unique sets of services they provide.

Below is a list of acute hospital cohorts and the hospitals assigned to each, based on FY15 data:

Cohort Designation	Acute Hospital
<b>AMC</b>	Beth Israel Deaconess Medical Center Boston Medical Center Brigham and Women's Hospital Massachusetts General Hospital Tufts Medical Center UMass Memorial Medical Center
<b>Teaching</b>	Baystate Medical Center Cambridge Health Alliance Lahey Hospital & Medical Center Mount Auburn Hospital Saint Vincent Hospital Steward Carney Hospital Steward St. Elizabeth's Medical Center
<b>Community</b>	Anna Jaques Hospital Baystate Mary Lane Hospital Beth Israel Deaconess Hospital – Milton Beth Israel Deaconess Hospital – Needham Brigham and Women's Faulkner Hospital^ Cooley Dickinson Hospital Emerson Hospital Hallmark Health Martha's Vineyard Hospital^ Milford Regional Medical Center Nantucket Cottage Hospital Newton-Wellesley Hospital Northeast Hospital South Shore Hospital Steward Norwood Hospital^ Winchester Hospital

# Acute Hospital Cohorts

<b>Community- High Public Payer</b>	Athol Hospital Baystate Franklin Medical Center Baystate Noble Hospital Baystate Wing Hospital Berkshire Medical Center^ Beth Israel Deaconess Hospital – Plymouth^ Cape Cod Hospital Clinton Hospital Fairview Hospital Falmouth Hospital Harrington Memorial Hospital HealthAlliance Hospital Heywood Hospital Holyoke Medical Center Lawrence General Hospital Lowell General Hospital^ Marlborough Hospital Mercy Medical Center MetroWest Medical Center^ Morton Hospital Nashoba Valley Medical Center^ North Shore Medical Center Signature Healthcare Brockton Hospital Southcoast Hospitals Group Steward Good Samaritan Medical Center Steward Holy Family Hospital Sturdy Memorial Hospital Steward Saint Anne’s Hospital
<b>Specialty</b>	Boston Children’s Hospital Dana-Farber Cancer Institute Kindred Hospital – Boston Kindred Hospital – Boston North Shore Massachusetts Eye and Ear Infirmary New England Baptist Hospital Shriners Hospitals for Children – Boston Shriners Hospitals for Children – Springfield

^These hospitals were in different cohorts in FY14. Berkshire Medical Center was in the teaching cohort in FY14. Brigham and Women’s Faulkner Hospital was in the teaching cohort in FY14. Martha Vineyard’s Hospital was in the community high public payer cohort in FY14. MetroWest Medical Center was in the community cohort in FY14. Steward Norwood Hospital was in the community high public payer in FY14.



# Acute Hospital Profiles: At a Glance

**Hospital system affiliation** notes with which multi-acute hospital system, if any, the hospital is affiliated.

**Change in ownership** notes change in ownership during the period of the analysis. In some cases, changes in ownership may have occurred subsequent to FY15.

**Total staffed beds** are the average number of beds during the fiscal year that were in service and staffed for patient use.

**Inpatient occupancy rate** is the average percent of staffed inpatient beds occupied during the reporting period. Percentage of occupancy is calculated as follows: Inpatient Days divided by Weighted Average Staffed Beds times 365 (or the number of days in the reporting period).

**Special public funding** indicates whether the hospital received Delivery System Transformation Initiative (DSTI), Infrastructure and Capacity Building (ICB) or Community Hospitals Acceleration, Revitalization and Transformation (CHART) grants. Special public funding is grant money given to hospitals by the state or federal government. The amounts listed may be total grant allocations that will be disbursed over a period of time, or a portion of a grant that was disbursed in FY15. For more information please see the Special Public Funding notes contained in Exhibit C of this appendix.

**Trauma Center designation** is determined by the Massachusetts Department of Public Health and the American College of Surgeons, with Level 1 being the highest designation given to tertiary care facilities. Facilities can be designated as Adult and/or Pediatric Trauma Centers.<sup>4</sup> While there are five levels of trauma center designations recognized nationally, Massachusetts hospitals only fall under Levels 1, 2, and 3 for Adult and/or Levels 1 and 2 for Pediatric.

**Level 1 Trauma Center** is a comprehensive regional resource that is a tertiary care facility central to the trauma system. A Level 1 Trauma Center is capable of providing total care for every aspect of injury, from prevention through rehabilitation.

**Level 2 Trauma Center** is able to initiate definitive care for all injured patients, and provide 24-hour immediate coverage by general surgeons, as well as coverage by the specialties of orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology and critical care.

**Level 3 Trauma Center** has demonstrated an ability to provide prompt assessment, resuscitation, surgery, intensive care and stabilization of injured patients and emergency operations, including the ability to provide 24-hour immediate coverage by emergency medicine physicians and prompt availability of general surgeons and anesthesiologists.

**Case mix index (CMI)** is a relative value assigned to the hospital's mix of inpatients to determine the overall acuity of the hospital's patients and is compared with the CMI of peer hospitals and the statewide average CMI. CHIA calculated each hospital's CMI by applying the 3M™ All Patient Refined (APR) grouper, version 30 with Massachusetts-specific baseline cost weights to each hospital's HDD data. Hospitals validate their HDD data submissions annually with CHIA.

The APR grouper and Massachusetts-specific baseline cost weights used in this year's publication are consistent with those used in last year's publication. All case mix information included in this report has been grouped under APR grouper, version 30.

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<sup>4</sup> American Trauma Society, Trauma Center Levels Explained. Available at: <http://www.amtrauma.org/?page=TraumaLevels> (last accessed March 7, 2017).

# Acute Hospital Profiles: At a Glance

**Inpatient Net Patient Service Revenue (NPSR) per Case Mix Adjusted Discharge (CMAD)** measures the hospital's NPSR divided by the product of the hospital's discharges and its case mix index. NPSR includes both net inpatient revenue and inpatient premium revenue.

**Inpatient Net Revenue per CMAD** growth rate for each hospital was calculated by dividing the hospital's Net Patient Service Revenue (NPSR) by the total CMADs

**Inpatient – outpatient revenue** is derived from the amount of GPSR reported for inpatient and outpatient services in the Hospital Cost Report.

**Outpatient revenue** is the hospital's reported net revenue for outpatient services. Net outpatient service revenue includes both net outpatient revenue and outpatient premium revenue.

**Outpatient Revenue** growth rate for each hospital represents the percent change in a hospital's reported net revenue for outpatient services. Note that this measure examines the growth in total outpatient revenue and is not adjusted for patient volume, severity or service mix.

**Total revenue** is the hospital's total unrestricted revenue in FY15.

**Total surplus (loss)** is the hospital's reported profit/loss in FY15.

**Public payer mix** is determined based upon the hospital's reported Gross Patient Service Revenue (GPSR). See Payer Mix metric description in this appendix for more information.

**Calendar Year (CY) 2015 Commercial Relative Price** reflects a relativity calculated for a given provider across all commercial payers (statewide RP or "S-RP"). For more information on S-RP methodology, refer to <http://www.chiamass.gov/assets/docs/g/S-RP-Methods-Memo-2017.pdf>

**Top three commercial payers** represent those with the largest percentage share of total commercial payments at that hospital.

**Inpatient discharges** data was sourced from the Hospital Cost Report. See the Inpatient Discharge metric for more information.

**Inpatient discharges** growth rate for each hospital measures the percent change in discharges for inpatient admissions.

**Emergency department visits** include any visit by a patient to an emergency department that results in registration at the Emergency Department but does not result in an outpatient observation stay or the inpatient admission of the patient at the reporting facility. An Emergency Department visit occurs even if the only service provided to a registered patient is triage or screening.

**Emergency department visits** growth rate for each hospital measures the percent change in emergency department visits.

**Outpatient visits** are the total outpatient visits reported by the hospital. Note that outpatient visits may not be uniformly reported across hospitals. Outpatient visits varied considerably from FY14 to FY15 for some hospitals. Where substantial increases / decreases were observed, hospitals were notified and afforded the opportunity to update the information provided. In most cases, hospitals provided explanations but did not revise their data.

# Acute Hospital Profiles: At a Glance

**Outpatient visits** growth rate for each hospital measures the percent change in total outpatient visits to a hospital.

**Readmission rate** is calculated using the Hospital-Wide All-Cause Unplanned 30-day Readmission Measure developed by CMS and the Yale Center for Outcomes Research, and applied to the Massachusetts adult all-payer population. Readmissions are defined as an admission for any reason to the same or a different hospital within 30 days of a previous discharge. Obstetric, primary behavioral health, cancer, and rehabilitation discharges are excluded from the calculations. The raw readmissions rate is reported, which is the number of readmissions within 30 days divided by the total number of eligible discharges.

**Early elective deliveries rate** measures the proportion of deliveries that were completed between 37 to 39 weeks gestation without medical necessity, following an induction or cesarean section. Thirty-two acute hospitals reported data for this indicator. All data were received from The Leapfrog Group as pre-calculated percentages. The patient population represents all payers and all ages, and the data period was 2014-2015. Participation in the Leapfrog survey is voluntary; where a hospital does not complete the survey or report on certain items in the survey, the measure is also not included in the profiles.

# Acute Hospital Cohort Profile: Metric Descriptions

## Acute Hospital Profiles: Services

**Most common inpatient diagnosis related groups (DRGs)** and the percentage of those DRGs treated at that hospital for the region.

- **Data Source:** FY15 HDD data and the 3M™ APR-DRG 30 All Patient Refined Groupers
- **Hospital Calculation:** Each discharge was grouped and ranked by DRG code. The subject hospital's 10 most frequently occurring DRGs were identified and those DRGs were then summed for all hospitals in the region in order to calculate the percent of regional discharges that were treated at the subject hospital. The total number of the subject hospital's discharges was compared to the sum of all hospital discharges in the region to determine the overall proportion of regional discharges.

For more information on DRGs, please see Exhibit B of this Appendix.

**Most common communities** from where the hospital's inpatient discharges originated, and the total percent of all discharges (from Massachusetts hospitals) from that community that went to that hospital.

- **Data Source:** FY15 HDD data for discharge information; patient origin was determined by the zip codes from where the patients resided. In larger cities, the top communities may reflect postal code neighborhoods.
- **Hospital Calculation:** The zip code for each patient discharge was matched with the USPS community name, and then grouped and ranked. The most frequently occurring communities were then summed for all hospitals in the region to calculate the percent of community discharges that went to the subject hospital.

A hospital's top communities by inpatient origin were determined using a hospital's FY15 discharge data from the HDD. Patient origin was determined by the reported zip code for each patient's residence. In larger cities, communities may include multiple zip codes. These zip codes were rolled up to reflect postal code neighborhoods based on the United States Postal Service Database. For more information on the zip codes included within each region, please see the databook.

For example, Boston zip codes were rolled up to the following designations: Boston (Downtown) includes: Back Bay, Beacon Hill, Downtown Boston, the Financial District, East Boston, Fenway/Kenmore, South Boston and South End. The remaining Boston communities with multiple zip codes were rolled up to these designations: Allston, Brighton, Charlestown, Dorchester, Dorchester Center, Hyde Park, Jamaica Plain, Mattapan, Mission Hill, Roslindale, Roxbury, and West Roxbury.

## Acute Hospital Profiles: Quality Measures

To compile provider quality performance information, CHIA relied on the following primary data sources: CHIA's Hospital Discharge Database (HDD), the Centers for Medicare and Medicaid Services (CMS) Hospital Compare database, and The Leapfrog Group. Metrics are based on varied data periods due to differences in reporting time frames across the data sources. For each metric, the associated reporting time period is listed.

**Health Care-Associated Infections** of three different types are reported:

1. Central Line-Associated Blood Stream Infections (CLABSI): This measure captures the observed rate of health care-associated central line-associated bloodstream infections among patients in an inpatient acute hospital, compared to the expected number of infections based on the hospital's characteristics and case mix.

# Acute Hospital Cohort Profile: Metric Descriptions

2. Catheter-Related Urinary Tract Infections (CAUTI): This measure captures the observed rate of health care-associated catheter-related urinary tract infections among patients in an inpatient acute hospital (excluding patients in Level II or III neonatal ICUs), compared to the expected number of infections based on the hospital's characteristics and case mix.
3. Surgical Site Infections (SSI): Colon Surgery: This measure captures the observed rate of deep incisional primary or organ/space surgical site infections during the 30-day postoperative period following inpatient colon surgery, compared to the expected number of infections based on the hospital's characteristics and case mix.

- **Data source:** CMS Hospital Compare
- **Data Period:** 2015
- **Hospital Calculation:** These health care-associated infections are reported using the Standard Infection Ratio (SIR), which is the number of infections in a hospital compared to the number of expected infections. The SIR for CLABSI and CAUTI is risk adjusted for type of patient care locations, hospital affiliation with a medical school, and bed size. The SIR for SSI: Colon Surgery is risk adjusted for procedure-related factors, such as: duration of surgery, surgical wound class, use of endoscope, re-operation status, patient age, and patient assessment at time of anesthesiology.

All SIRs for Health Care-Associated Infections are retrieved from CMS Hospital Compare as pre-calculated SIRs.

- **Cohort Calculation:** Not applicable
- **National Comparative:** CMS Hospital Compare
- **Patient Population:** All payers, Age 18+

**Hospital Readmission rates** are calculated using the Hospital-Wide All-Cause Unplanned 30-day Readmission Measure developed by CMS and the Yale Center for Outcomes Research, and applied to the Massachusetts adult all-payer population. Readmissions are defined as an admission for any reason to the same or a different hospital within 30 days of a previous discharge. Obstetric, primary behavioral health, cancer, and rehabilitation discharges are excluded from the calculations. The raw readmission rate is reported, which is the number of readmissions within 30 days divided by the total number of eligible discharges.

- **Data source:** CHIA's Hospital Discharge Database
- **Data Period:** FY 2015
- **Hospital Calculation:** The raw readmission rate reflects the number of unplanned readmissions within 30 days divided by the total number of eligible discharges during the designated time period.
- **Cohort Calculation:** Not applicable
- **State Comparative:** The method yields a statewide readmission rate across all the Commonwealth's acute-care hospitals for the designated time period.
- **Patient Population:** All payers, age 18+, excluding obstetric, primary psychiatric, cancer, and rehabilitation discharges.

# Acute Hospital Cohort Profile: Metric Descriptions

## Acute Hospital Profiles: Utilization Trends

**Change in volume of inpatient discharges** measures discharges for inpatient admissions.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 3, Row 22, Column 12  
FY15 Hospital Cost Report: Tab 3, Line 500, Column 5
- **Hospital index calculation:** Displays the percent change in the number of inpatient discharges for each year, using FY11 as the base year. FY12:  $(FY12 - FY11)/FY11$ , FY13:  $(FY13 - FY11)/FY11$ , FY14:  $(FY14 - FY11)/FY11$ , FY15:  $(FY15 - FY11)/FY11$ .
- **Cohort calculation:** Represents the percent change of total discharges across all hospitals in the cohort for each year. For example: Cohort for FY12 =  $(\text{Sum of discharges at cohort hospitals in FY12} - \text{Sum of discharges at cohort hospitals in FY11}) / \text{Sum of discharges at cohort hospitals in FY11}$

**Change in volume of outpatient visits** measures total outpatient visits to a hospital. Note that outpatient visits may not be uniformly reported across hospitals.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 5a, Row 39, Column 2  
FY15 Hospital Cost Report: Tab 5, Line 301, Column 1
- **Hospital index calculation:** Calculate the percent change between each year, using FY11 as the base year. FY12:  $(FY12 - FY11)/FY11$ , FY13:  $(FY13 - FY11)/FY11$ , FY14:  $(FY14 - FY11)/FY11$ , FY15:  $(FY15 - FY11)/FY11$ .
- **Cohort calculation:** Represents the median of the percent change across all hospitals in the cohort for each year. For example: Cohort for FY11 = median of (% change for hospital A, % change for hospital B, % change for hospital C...)

## Acute Hospital Profiles: Patient Revenue Trends

**Net inpatient service revenue per case mix adjusted discharge (CMAD)** measures the hospital's net inpatient service revenue (NPSR) divided by the product of the number of the hospital's discharges and its case mix index. NPSR includes both net inpatient revenue and inpatient premium revenue.

- **Data Source:** NPSR and discharges were sourced from the Hospital Cost Report; Case Mix Index (CMI) is sourced from HDD.
- **Hospital calculation:** The hospital's inpatient net revenue per CMAD was calculated by dividing NPSR by the total CMAD for each year.
- **Cohort calculation:** The range of all revenue/CMAD values for cohort hospitals are represented by the vertical black line. The cohort value denotes the median revenue per CMAD for all cohort hospitals.

### Variation in inpatient discharge counts:

Hospitals may report different numbers of discharges on the Hospital Cost Report and the HDD. Hospitals have explained that this is due to:

- **Timing** – while HDD is accurate when submitted (75 days after the close of a quarter), a case may be reclassified as outpatient, usually due to a change in payer designation. Payers may have different clinical criteria for defining an inpatient and outpatient stay.

# Acute Hospital Cohort Profile: Metric Descriptions

- *HDD edits* – discharges reported by the hospital that did not pass HDD edits may have been excluded from the HDD but included in the Hospital Cost Report;
- Payer classification/status differences between the Hospital Cost Report and HDD;

Since a hospital's case mix index is calculated using the HDD, which often includes a lower number of discharges than reported by the hospital on the Hospital Cost Report, the calculation of a hospital's total case mix adjusted discharges equals the number of discharges reported on the Hospital Cost Report, multiplied by the case mix index.

**Change in total outpatient revenue** measures a hospital's reported net revenue for outpatient services. Net outpatient service revenue includes both net outpatient revenue and outpatient premium revenue. Note that this measure examines the growth in total outpatient revenue and is not adjusted for patient volume, severity or service mix.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 5a, Rows 78.01 (net outpatient revenue) + 78.02 (outpatient premium revenue), Column 2  
FY15 Hospital Cost Report: Tab 5, Line 209, Column 1
- **Hospital index calculation:** Displays the percent change between each year, using FY11 as the base year. FY12:  $(FY12 - FY11)/FY11$ , FY13:  $(FY13 - FY11)/FY11$ , FY14:  $(FY14 - FY11)/FY11$ , FY15:  $(FY15 - FY11)/FY11$ .
- **Cohort calculation:** Represents the median of the percent change across all hospitals in the cohort for each year. For example: Cohort for FY11 = median of (% change for hospital A, % change for hospital B, % change for hospital C...)

## Acute Hospital Profiles: Financial Performance

**Total Revenue, Total Costs and Profit / Loss** measure the amount of the subject hospital's Total Revenue, Total Costs, and Total Profit or Loss for each year from 2011 through 2015.

- **Data Sources:** Financial Statements: The line numbers for each data point are as follows: Total Unrestricted Revenue (row 65), Operating Revenue (row 57.2), Non-Operating Revenue (row 64.1), Total Expenses (row 73), and Profit / Loss (row 74).

**Total Margin** measures the subject hospital's overall financial performance compared to the median total margin of the hospitals in its peer cohort.

- **Data Source:** Financial Statements: Excess of Revenue, Gains, & Other Support (row 74) divided by Total Unrestricted Revenue (row 65)
- **Cohort Calculation:** Calculated median for the cohort group.

**Operating Margin** measures the subject hospital's financial performance of its primary, patient care activities compared to the median operating margin of the hospitals in its peer cohort.

- **Data Source:** Financial Statements: Operating Revenue (row 57.2) minus Total Expenses (row 73) divided by Total Unrestricted Revenue (row 65)
- **Cohort Calculation:** Calculated median for the cohort group.

**Note:** Hospitals may have been assigned to different cohorts in previous years due to payer mix in that given year or other factors. To remain consistent in comparisons between cohorts across multiple years,

# Acute Hospital Cohort Profile: Metric Descriptions

hospitals were retroactively assigned to their FY15 cohort designations for all years examined. The number of hospitals included in a given cohort may vary from year to year due to hospital closures.

The acute hospital cohort profile measures the acute hospital cohorts as composites of the individual hospitals assigned to each cohort. In general, metrics were determined by aggregating the values of all hospitals assigned to the cohort. For comparison purposes, the individual cohorts are compared to one another and all hospitals statewide, including specialties.<sup>5</sup> The analytic metrics are largely the same as the metrics used for the individual hospital profiles, except as noted below. Please see the descriptions and calculation methods described in the Acute Hospital Metric Description section for more information.

**Inpatient Severity Distribution** measures the percentage of a cohort's discharges that falls into each statewide severity quintile. This metric provides a way to compare the severity levels of the cohort's patients to those of other acute hospitals in Massachusetts.

- **Data Source:** Hospital Discharge Database (HDD).
- **Data Period:** FY15
- **Cohort Calculation:** Every discharge in the state has a Diagnosis Related Group (DRG) code associated with it. Severity quintiles were determined by ranking all possible DRG outputs by case-weight. The cohort calculation shows the percentage of a cohort's aggregate discharges that falls into each quintile. These proportions were then compared with the proportions of aggregated discharges by severity quintile for all hospitals assigned to other cohorts.

*In cases where metrics were similar to the acute hospital profile metrics, data was aggregated to determine cohort measures. For example:*

**The most common inpatient DRGs** for each subject cohort were determined by categorizing all of the hospitals' discharges by cohort using the All Patient Refined Grouper (3M™ APR-DRG 30), which were then summed and ranked. Each of the subject cohort's ten most frequently occurring DRGs were then divided by the statewide count per DRG to obtain the percent of discharges to the statewide total.

*The cohort comparison metric for **payer mix** is different from comparisons among acute hospitals:*

**Payer mix** was calculated differently from other measures due to the fact that the underlying charges that comprise GPSR differ across hospitals. For this measure, the cohort payer mix was first calculated for each hospital assigned to the cohort in the manner described in the Acute Hospital Profiles section of this Appendix. The mean of the individual cohort hospital's experience was determined and is displayed here. The same method was used to determine the trend in outpatient visits for comparison to all other cohort hospitals.

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<sup>5</sup> Note that specialty hospitals are not assigned to any cohort due to their unique service mix and/or populations served.



# Non-Acute Hospitals

Non-acute hospitals in Massachusetts are typically identified as psychiatric, rehabilitation, and chronic care facilities. CHIA has defined non-acute hospitals in this publication using the Massachusetts Department of Public Health (DPH) and Department of Mental Health (DMH) license criteria.

## Non-Acute Hospital Location and Multi-Hospital System Affiliations

The location for each non-acute hospital in this report was obtained, where possible, from hospital licensing information collected by DPH. The hospital license includes information on a hospital's campuses and satellite offices.

Multi-hospital system membership identifies the health system with which the subject non-acute hospital is a member. This information was derived from the hospital's Audited Financial Statements.

Below is a list of Massachusetts multi-hospital systems and their non-acute hospital members:

Multi-Hospital System	Non-Acute Hospital Member
<b>Arbour Health System</b>	Arbour Hospital Arbour-Fuller Memorial Arbour-HRI Hospital Westwood Pembroke Hospital
<b>HealthSouth</b>	Braintree Rehabilitation Hospital HealthSouth Rehabilitation of Western MA Fairlawn Rehabilitation Hospital New England Rehabilitation Hospital
<b>Kindred Health Care</b>	Kindred Hospital Northeast
<b>Partners HealthCare System</b>	McLean Hospital Spaulding Rehabilitation Hospital of Cape Cod Spaulding North Shore <sup>6</sup> Spaulding Rehabilitation Hospital Spaulding Hospital Cambridge
<b>Vibra HealthCare</b>	Vibra Hospital of Western MA New Bedford Rehabilitation Hospital
<b>Steward Health Care System</b>	New England Sinai Hospital
<b>Whittier Health System</b>	Whittier Pavilion Whittier Rehabilitation Hospital Bradford Whittier Rehabilitation Hospital Westborough

## Non-Acute Hospital Cohorts

Non-acute hospitals were assigned to peer cohorts based upon MassHealth regulatory designations, defined by the criteria below<sup>7</sup>:

**Psychiatric hospitals** are licensed by the DMH for psychiatric services, and by DPH for substance abuse services.

**Rehabilitation hospitals** provide intensive post-acute rehabilitation services, such as physical, occupational, and speech therapy services. For Medicare payment purposes, the federal

<sup>6</sup> Spaulding North Shore closed on July 31, 2015.

<sup>7</sup> State-owned non-acute hospitals are not included in this publication.

# Non-Acute Hospitals

government classifies hospitals as rehabilitation hospitals if they provide more than 60% of their inpatient services to patients with one or more of 13 diagnoses listed in federal regulations.<sup>8</sup>

**Chronic care hospitals** are hospitals with an average length of stay greater than 25 days. These hospitals typically provide longer-term care, such as ventilator-dependent care. Medicare classifies chronic hospitals as Long-Term Care Hospitals, using the same 25-day threshold.

Non-acute specialty hospitals were not included in any cohort comparison analysis due the unique patient populations they serve and/or the unique sets of services they provide. Non-acute hospitals that were considered specialty hospitals include:

- AdCare Hospital of Worcester - provides substance abuse services
- Franciscan Hospital for Children - provides specialized children’s services
- Hebrew Rehabilitation Hospital - specializes in providing longer term care than other chronic hospitals

Below is a list of non-acute hospital cohorts and the hospitals assigned to each:

Cohort Designation	Non-Acute Hospital
<b>Psychiatric Hospitals</b>	Arbour Hospital Arbour-Fuller Memorial Arbour-HRI Hospital Baldpate Hospital Bournewood Hospital McLean Hospital Walden Behavioral Care Westwood Pembroke Hospital Whittier Pavilion
<b>Rehabilitation Hospitals</b>	Braintree Rehabilitation Hospital HealthSouth Fairlawn Rehabilitation Hospital HealthSouth Rehabilitation Hospital of Western MA New Bedford Rehabilitation Hospital New England Rehabilitation Hospital Spaulding Rehabilitation Hospital of Cape Cod Spaulding Rehabilitation Hospital Whittier Rehabilitation Hospital Bradford Whittier Rehabilitation Hospital Westborough
<b>Chronic Care Hospitals</b>	Kindred Hospital Northeast New England Sinai Hospital Spaulding Hospital Cambridge Vibra Hospital of Western MA
<b>Specialty Non-Acute Hospitals</b>	AdCare Hospital of Worcester Franciscan Hospital for Children Hebrew Rehabilitation Hospital

<sup>8</sup> Code of Federal Regulations: 42 CFR 412.29(b)(2)

# Non-Acute Hospital Profiles: At a Glance

**Total staffed beds** are the average number of beds during the fiscal year that were in service and staffed for patient use. Beds ordinarily occupied for less than 24 hours are usually not included.

**Percent occupancy rate** is the median percent of staffed inpatient beds occupied during the reporting period. Percentage of occupancy is calculated as follows: Inpatient Days divided by Weighted Average Staffed Beds times 365 (or the number of days in the reporting period).

**Total inpatient days** include all days of care for all patients admitted to each unit. Measure includes the day of admission but not the day of discharge or death. If both admission and discharge or death occur on the same day, the day is considered a day of admission and is counted as one patient day.

**Total inpatient discharge** information was sourced from Schedule 3 of the FY14 AND EARLIER YEARS 403 Cost Report and Tab 3 of the FY15 Hospital Cost Report.

**Public payer mix** was determined based upon the hospital's reported GPSR. See Payer Mix metric description for more information.

**Total revenue** was sourced from the hospital's Hospital Cost Report.

**Inpatient – outpatient revenue** is derived from the amount of GPSR reported for inpatient and outpatient services in the hospital's Hospital Cost Report.

# Non-Acute Hospitals

## Non-Acute Hospital Profiles: Services

**Types of inpatient services** are defined by Discharges.

- **Data Sources:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 3, Column 12, Rows 1 through 21. FY15 Hospital Cost Report: Tab 3, Column 5, Lines 1 to 19.
- **Hospital calculation:** Hospital's absolute count of discharges by specific bed type.
- **Cohort calculation:** Hospital's absolute discharge count divided by cohort's total discharges by that specific bed type.
- Note: Psychiatric discharges do not include substance abuse discharges.

**Payer Mix** measures the distribution of total GPSR for across the major payer categories. This provides information regarding the proportion of services, as measured by gross charges, which a hospital provides to patients from each category of payer.

- **Data Source:** FY14 and earlier years 403 Cost Report: Schedule 5a, Row 44, Columns 3 -14  
FY15 Hospital Cost Report: Tab 5, Line 302, Column 2 through 13
- **Payer Category Definitions:** State Programs = Medicaid Managed + Medicaid Non-Managed + Health Safety Net (HSN); Federal Programs = Medicare Managed + Medicare Non-Managed + Other Government; Commercial & Other = Managed Care + Non-Managed Care + Self Pay + Workers Comp + Other + Connector Care. Dividing each of the above by Total GPSR results in the percentages displayed for each of the three categories.
- **Cohort Calculation:** Displays the mean of the percentages in each of the above payer categories across all hospitals in the cohort.
- **Average Hospital Calculation:** Displays the mean of the percentages in each of the payer categories to get each of the component percentages for the average non-acute hospital.
  - Note: "Average Hospital" group includes specialty hospitals.

**Change in Volume of Inpatient Days** includes all days of care for all patients admitted to each unit. Measure includes the day of admission but not the day of discharge or death. If both admission and discharge or death occur on the same day, the day is considered a day of admission and is counted as one patient day.

- **Data Sources:** FY14 AND EARLIER YEARS 403 Cost Report, Schedule 3, Column 6, Row 22  
FY15 Hospital Cost Report, Tab 3, Column 4, Line 500
- **Hospital Index calculation:** Calculated percent change in Inpatient Days for each year, using FY11 as the base year. FY12:  $(FY12 - FY11)/FY11$ , FY13:  $(FY13 - FY11)/FY11$ , FY14:  $(FY14 - FY11)/FY11$ , FY15:  $(FY15 - FY11)/FY11$ .
- **Cohort calculation:** Represents the median of the percent change across all hospitals in the cohort for each year. For example Cohort for FY11 = median of (% change for hospital A, % change for hospital B, % change for hospital C...)

**Median Average Length of Stay (ALOS)** measures the average duration of an inpatient admission.

# Non-Acute Hospitals

- **Data Sources:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 3, Column 13, Row 22  
FY15 Hospital Cost Report: Tab 3, Column 8, Line 500
- **Cohort calculation:** The growth in median ALOS for each cohort is calculated relative to FY11 as the base year. FY12:  $(FY12 - FY11)/FY11$ , FY13:  $(FY13 - FY11)/FY11$ , FY14:  $(FY14 - FY11)/FY11$ , FY15:  $(FY15 - FY11)/FY11$ .
- This is plotted against the growth in median ALOS among all non-acute hospitals, including specialties, relative to FY11.

## Non-Acute Hospital Profiles: Utilization

**Volume of Inpatient Days** includes all days of care for all patients admitted to each unit. Measure includes the day of admission but not the day of discharge or death. If both admission and discharge or death occur on the same day, the day is considered a day of admission and is counted as one patient day.

- **Data Sources:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 3, Column 6, Row 22  
FY15 Hospital Cost Report: Tab 3, Column 4, Line 500

**Average Length of Stay (ALOS)** measures the average duration of an inpatient admission.

- **Data Sources:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 3, Column 13, Row 22  
FY15 Hospital Cost Report: Tab 3, Column 8, Line 500

**Volume of Outpatient Visits** measures the total outpatient visits to a hospital.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report; Schedule 5a, Column 2, Row 39  
FY15 Hospital Cost Report: Tab 5, Column 1, Line 301

## Non-Acute Hospital Profiles: Patient Revenue Trends

**Inpatient Revenue per Day** is the hospital's net inpatient service revenue (NPSR) divided by its total inpatient days.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report: NPSR was sourced from schedule 5a, column 2, rows 65.01 (net inpatient revenue) and 65.02 (inpatient premium revenue).  
Inpatient days were sourced from Schedule 3, column 6, row 22. of the 403 Cost Report.  
FY15 Hospital Cost Report: NPSR including premium revenue was sourced from Tab 5, Column 1, Line 208. Inpatient days were sourced from Tab 3, Column 4, Line 500.

**Total Outpatient Revenue** measures a hospital's reported net revenue for outpatient services. Note that this measure examines the growth in total outpatient revenue and is not adjusted for patient volume. In addition, several non-acute hospitals do not provide outpatient services.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 5a, Column 2, Rows 78.01 (net outpatient revenue) and 78.02 (outpatient premium revenue)  
FY15 Hospital Cost Report: Tab 5, Line 209 (outpatient NPSR including premium revenue)

# Non-Acute Hospitals

## Non-Acute Hospital Profiles: Financial Performance

**Operating Revenue, Total Revenue, Total Costs and Profit / Loss** displays the amount of each hospital's Total Revenue, Operating Revenue, Total Costs, and Total Profit or Loss.

- **Data Sources:** FY14 AND EARLIER YEARS 403 Cost Report, Schedule 23 / Hospital Cost Report, Tab 11. For FY15, the line numbers for each data point are as follows: Total Unrestricted Revenue (row 65), Operating Revenue (row 55 + row 56 + row 57+ row 60 + row 64 for the 403 cost report and Line 57.2 for the Hospital Cost report), Total Expenses (row 73), and Profit / Loss: (row 74).

**Total Margin** measures the subject hospital's overall financial performance.

- **Data Source:** FY14 AND EARLIER YEARS 403 Cost Report: Schedule 23, Column 2, Row 173  
FY15 Hospital Cost report: Tab 11, Column 1, Line 74 (Excess of Revenue, Gains & other support Over Expenses) divided by Tab 11, Column 1, Line 65 (Total Unrestricted Revenue, Gains and Other Supports)

**Note:** Some for-profit hospitals are organized as S corporations. For-profit entities that are organized as S corporations, in accordance with Internal Revenue Code, do not pay federal income tax on their taxable income. Instead, the shareholders are liable for individual federal income taxes on their portion of the hospital's taxable income. Therefore, these hospitals may have income that appears higher than hospitals organized as a C corporation, which are taxed separately from their owners.

# Technical Appendix:

## Exhibit A. Hospital-Specific Information & Subsequent Events

### Acute Hospitals

**Athol Hospital** responded to the FY11 to FY15 data verification process for FY12 through FY14 data only.

**Beth Israel Deaconess Hospital- Plymouth** (formerly Jordan Hospital) affiliated with Beth Israel Deaconess Medical Center effective January 1, 2014. The CareGroup system profile includes data for Beth Israel Deaconess Hospital –Plymouth prior to the affiliation with BIDMC in FY14 (October 1, 2013 through December 31, 2013).

**Brigham and Women’s Hospital** reported a 42% decrease in outpatient visits from 645,563 in FY2014 to 375,864 in FY2015. It was noted that outpatient revenue increased during this same period. The hospital indicated the discrepancy was related to a change in internal systems, and expects that future years will be consistent with FY2014.

### **Boston Medical Center**

Outpatient metrics for Boston Medical Center (BMC) include information for the following freestanding community health centers:

1. East Boston Neighborhood Health Center
2. Codman Square Health Center
3. Dorchester House Multi-Service Center
4. South Boston Community Health Center

**Curahealth Hospitals** have limited acute hospital information included in this report, as they are considered long-term acute care hospitals for the period of FY2011-FY2015. Curahealth Hospital- Boston and Curahealth Hospital- Boston North Shore were acute hospitals; however, as their data does not align with the other acute hospitals, they are not included in the cohort analysis.

**Lawrence General Hospital** reported a 56.0% increase in outpatient visits from FY2014 to FY2015. The hospital indicated the discrepancy was related to a change in internal systems, and expects that future years will be consistent with FY2014.

**Lowell General Hospital** acquired Saints Medical Center effective July 1, 2012. For FY12, the Financial Statement data submitted by Lowell General Hospital includes 3 months of financial data for Saints Medical Center, in addition to 12 months of financial information for Lowell General Hospital. Saints Medical Center did not submit additional financial statement data for FY12. Each entity submitted a separate 403 Cost Report for FY09 through FY12. For FY14, both Financial Statement and 403 Cost Report data submitted by Lowell General Hospital includes Saints Medical Center data.

On October 20, 2014, Tufts Medical Center and Lowell General Hospital combined under a new parent company (Wellforce) and created a new multi-acute hospital system.

**Mercy Hospital** changed its fiscal year end date from December 31 to June 1 beginning July 1, 2013. Its 2013 Financial Statement filing reflects six months of data (January 1, 2013- June 30, 2013).

**Merrimack Valley Hospital**, owned by Steward Health Care System, merged with Steward Holy Family Hospital, and became a campus of Steward Holy Family Hospital effective August 2014.

# Technical Appendix:

## Exhibit A. Hospital-Specific Information & Subsequent Events

**North Adams Regional Hospital** announced on March 25, 2014 a closure of the hospital and related health care businesses effective March 28, 2014. The hospital building is now operating as a satellite emergency department for Berkshire Medical Center.

**Noble Hospital** was acquired by Baystate Health in June 2015. Noble Hospital was renamed Baystate Noble Hospital.

**Quincy Medical Center** closed on December 26, 2014. The hospital building is now operating as a satellite emergency department for Steward Carney Hospital.

**Saints Medical Center** submitted 403 Cost Report data for FY11 through FY12, but financial statements only for FY11 due to a merger with Lowell General Hospital effective July 1, 2012.

**Shriners Hospitals for Children** (both Boston and Springfield locations) began submitting data to CHIA in FY11.

**South Shore Hospital** reported revenue and total margin data for FY2015 that includes approximately \$29 million in a non-operating, nonrecurring sale of investments transaction.

**Steward Good Samaritan Medical Center** is located in the Metro South region; however, one of its campuses is located in Metro West region. Information for the campus located in Metro West is included in the Steward Good Samaritan Medical Center metrics.

**Steward Health Care System:** Fiscal year data for certain hospitals in the Steward Health Care System was annualized for comparison purposes.

Steward Health Care acquired six hospitals in FY10:

1. Steward St. Elizabeth's Medical Center
2. Steward Saint Anne's Hospital
3. Steward Carney Hospital
4. Steward Good Samaritan Medical Center
5. Steward Norwood Hospital
6. Steward Holy Family Hospital

FY11 403 Cost Report data for these hospitals reflects a period of 329 days, while FY10 403 Cost Report data reflects a period of 401 days. To account for these variances, 403-sourced data was annualized for these two fiscal years.

**Winchester Hospital** became a member of Lahey Health in July 2014.

### Non-acute Hospitals

**Spaulding Hospital Cambridge** As of FY14, Spaulding Hospital Cambridge no longer provides outpatient services. Outpatient visits are reported in FY2011 through FY2015, and insignificant amounts of Net Outpatient Revenue were reported in FY2011 and FY2012. No Net Outpatient Revenue was reported for FY2013 through FY2015 due to deductions from Gross Revenue.

**Bournewood Hospital** is a sub-chapter S corporation.

**Kindred Northeast Hospital** reported outpatient revenues in FY11 to FY14 with no reporting of outpatient visits. Data suppressed due to data concerns.

**New Bedford Rehabilitation Hospital** reported outpatient revenues in FY11 to FY15 with no reporting of outpatient visits. Data suppressed due to data concerns.



# Technical Appendix:

## Exhibit A. Hospital-Specific Information & Subsequent Events

**Radius Specialty Hospital** closed its Roxbury and Quincy rehabilitation facilities in October 2014.

**Whittier Pavilion** began providing outpatient services in FY14. FY14 outpatient data represents a partial year of operation for these services.

**Spaulding North Shore** discontinued inpatient operations as of July 31, 2015.

# Technical Appendix:

## Exhibit B. Diagnosis Related Groups (DRGs)

**Diagnosis Related Groups (DRGs)** are used to classify the patient illnesses a hospital treats.

The 10 most common DRGs for each hospital were determined by categorizing all of a hospital's discharges into DRGs defined in the All Patient Refined Grouper (3M™ APR-DRG 30) and ranked by the total number of discharges. In most cases, it was necessary for CHIA to abbreviate the DRG name in order to fit the space available.

Below is a list of abbreviated DRG descriptions that appear in the report, and the full name and APR-DRG 30 code for each DRG.

Abbreviated Description	Description	APR DRG v.30
<b>3rd Degree Brn w Skn Grft</b>	Extensive 3rd Degree Burns w Skin Graft	841
<b>Acute Leukemia</b>	Acute Leukemia	690
<b>Acute Myocardial Infarct.</b>	Acute Myocardial Infarction	190
<b>Adjust Dis/Neuroses exc DD</b>	Adjustment Disorders & Neuroses Except Depressive Diagnoses	755
<b>Alcohol &amp; Drug w/ Rehab</b>	Alcohol & Drug Dependence w Rehab Or Rehab/Detox Therapy	772
<b>Alcohol Abuse &amp; Dependence</b>	Alcohol Abuse & Dependence	775
<b>Angina Pectoris</b>	Angina Pectoris & Coronary Atherosclerosis	198
<b>Appendectomy</b>	Appendectomy	225
<b>Asthma</b>	Asthma	141
<b>Bacterial Skin Infections</b>	Cellulitis & Other Bacterial Skin Infections	383
<b>Bipolar Disorders</b>	Bipolar Disorders	753
<b>Bone Marrow Transplant</b>	Bone Marrow Transplant	3
<b>Bronchiolitis Pneumonia</b>	Bronchiolitis & RSV Pneumonia	138
<b>Burns w/ or w/o Skin Grft</b>	Partial Thickness Burns w Or w/o Skin Graft	844
<b>C. Spinal Fusion &amp; Other Procs</b>	Cervical Spinal Fusion & Other Back/Neck Proc Exc Disc Excis/Decomp	321
<b>Card Cath - Heart Disease</b>	Cardiac Catheterization For Ischemic Heart Disease	192
<b>Cardiac Arrhythmia</b>	Cardiac Arrhythmia & Conduction Disorders	201
<b>Cardiac Valve w/o Cath</b>	Cardiac Valve Procedures w/o Cardiac Catheterization	163
<b>CC W Circ Disord Exc IHD</b>	Cardiac Catheterization W Circ Disord Exc Ischemic Heart Disease	191
<b>Cesarean Delivery</b>	Cesarean Delivery	540
<b>Chemotherapy</b>	Chemotherapy	693
<b>Chest Pain</b>	Chest Pain	203
<b>Cleft Lip &amp; Palate Repair</b>	Cleft Lip & Palate Repair	95
<b>COPD</b>	Chronic Obstructive Pulmonary Disease	140
<b>Craniotomy; exc Trauma</b>	Craniotomy Except For Trauma	21
<b>CVA Occlusion w/ Infarct</b>	CVA & Precerebral Occlusion W Infarct	45
<b>D&amp;L Fusion exc Curvature</b>	Dorsal & Lumbar Fusion Proc Except For Curvature Of Back	304

# Technical Appendix:

## Exhibit B. Diagnosis Related Groups (DRGs)

<b>D&amp;L Fusion for Curvature</b>	Dorsal & Lumbar Fusion Proc For Curvature Of Back	303
<b>Degen Nrvs Syst exc MS</b>	Degenerative Nervous System Disorders Exc Mult Sclerosis	42
<b>Depression exc MDD</b>	Depression Except Major Depressive Disorder	754
<b>Digestive Malignancy</b>	Digestive Malignancy	240
<b>Diverticulitis/osis</b>	Diverticulitis & Diverticulosis	244
<b>Drug/Alcohol Abuse, LAMA</b>	Drug & Alcohol Abuse Or Dependence, Left Against Medical Advice	770
<b>Eye Procs except Orbit</b>	Eye Procedures Except Orbit	73
<b>Factors Infl Hlth Status</b>	Signs, Symptoms & Other Factors Influencing Health Status	861
<b>Foot &amp; Toe Procedures</b>	Foot & Toe Procedures	314
<b>Full Burns w/ Skin Graft</b>	Full Thickness Burns w Skin Graft	842
<b>Hand &amp; Wrist Procedures</b>	Hand & Wrist Procedures	316
<b>Heart Failure</b>	Heart Failure	194
<b>Hip &amp; Femur; Non-Trauma</b>	Hip & Femur Procedures For Non-Trauma Except Joint Replacement	309
<b>Hip Joint Replacement</b>	Hip Joint Replacement	301
<b>Infects- Upper Resp Tract</b>	Infections Of Upper Respiratory Tract	113
<b>Intervertebral Disc Excis</b>	Intervertebral Disc Excision & Decompression	310
<b>Intestinal Obstruction</b>	Intestinal Obstruction	247
<b>Kidney &amp; UT Infections</b>	Kidney & Urinary Tract Infections	463
<b>Knee &amp; Lower Excpt Foot</b>	Knee & Lower Leg Procedures Except Foot	313
<b>Knee Joint Replacement</b>	Knee Joint Replacement	302
<b>Lymphoma &amp; Non-Acute Leuk</b>	Lymphoma, Myeloma & Non-Acute Leukemia	691
<b>Maj Cranial/Facial Bone</b>	Major Cranial/Facial Bone Procedures	89
<b>Maj HEM/IG Dx exc SCD</b>	Major Hematologic/Immunologic Diag Exc Sickle Cell Crisis & Coagul	660
<b>Maj Larynx &amp; Trachea Proc</b>	Major Larynx & Trachea Procedures	90
<b>Maj Male Pelvic Procs</b>	Major Male Pelvic Procedures	480
<b>Maj Resp &amp; Chest Proc</b>	Major Respiratory & Chest Procedures	120
<b>Maj Resp Infect &amp; Inflam</b>	Major Respiratory Infections & Inflammations	137
<b>Maj Sml &amp; Lrg Bowel Procs</b>	Major Small & Large Bowel Procedures	221
<b>Maj. Depressive Disorders</b>	Major Depressive Disorders & Other/Unspecified Psychoses	751
<b>Malignancy- Hept/Pancreas</b>	Malignancy Of Hepatobiliary System & Pancreas	281
<b>Mastectomy Procedures</b>	Mastectomy Procedures	362
<b>Newborn</b>	Neonate Birthwt>2499G, Normal Newborn or Neonate w Other Problem	640
<b>Non-Bact Gastro, Nausea</b>	Non-Bacterial Gastroenteritis, Nausea & Vomiting	249
<b>O.R. Proc for Tx Comp</b>	O.R. Procedure For Other Complications Of Treatment	791

# Technical Appendix:

## Exhibit B. Diagnosis Related Groups (DRGs)

<b>Opioid Abuse &amp; Dependence</b>	Opioid Abuse & Dependence	773
<b>Org Mental Hlth Disturb</b>	Organic Mental Health Disturbances	757
<b>Other Anemia and Blood Dis</b>	Blood Other Anemia & Disorders of Blood & Blood-Forming Organs	663
<b>Other Antepartum Dx</b>	Other Antepartum Diagnoses	566
<b>Other Digestive System Dx</b>	Other Digestive System Diagnoses	254
<b>Other ENT &amp; Cranial Dx</b>	Other Ear, Nose, Mouth, Throat & Cranial/Facial Diagnoses	115
<b>Other ENT Procedures</b>	Other Ear, Nose, Mouth & Throat Procedures	98
<b>Other Nervous Syst Procs</b>	Other Nervous System & Related Procedures	26
<b>Other Pneumonia</b>	Other Pneumonia	139
<b>Other Resp &amp; Chest Procs</b>	Other Respiratory & Chest Procedures	121
<b>Othr Back &amp; Neck Disorder</b>	Other Back & Neck Disorders, Fractures & Injuries	347
<b>Othr Maj Head/Neck procs</b>	Other Major Head & Neck Procedures	91
<b>Othr Muscl Sys &amp; Tis Proc</b>	Other Musculoskeletal System & Connective Tissue Procedures	320
<b>Othr Muscle-skel Syst Dx</b>	Other Musculoskeletal System & Connective Tissue Diagnoses	351
<b>Othr O.R. Procs for Lymph/HEM</b>	Other O.R. Procedures For Lymphatic/Hematopoietic/Other Neoplasms	681
<b>Othr Skin &amp; Breast Dis</b>	Other Skin, Subcutaneous Tissue & Breast Disorders	385
<b>Othr Skin, Tis &amp; Related</b>	Other Skin, Subcutaneous Tissue & Related Procedures	364
<b>Pancreas Dis exc Malig</b>	Disorders Of Pancreas Except Malignancy	282
<b>Per Cardio procs w/ AMI</b>	Percutaneous Cardiovascular Procedures w AMI	174
<b>Per Cardio procs w/o AMI</b>	Percutaneous Cardiovascular Procedures w/o AMI	175
<b>Post-Op, Oth Device Infect</b>	Post-Operative, Post-Traumatic, Other Device Infections	721
<b>Procedures for Obesity</b>	Procedures For Obesity	403
<b>Pulm Edema &amp; Resp Failure</b>	Pulmonary Edema & Respiratory Failure	133
<b>Rehabilitation</b>	Rehabilitation	860
<b>Renal Failure</b>	Renal Failure	460
<b>Respiratory Malignancy</b>	Respiratory Malignancy	136
<b>Schizophrenia</b>	Schizophrenia	750
<b>Seizure</b>	Seizure	53
<b>Septicemia Infections</b>	Septicemia & Disseminated Infections	720
<b>Shoulder &amp; Arm Procs</b>	Shoulder, Upper Arm & Forearm Procedures	315
<b>Sickle Cell Anemia Crisis</b>	Sickle Cell Anemia Crisis	662
<b>Skin Graft for Skin Dx</b>	Skin Graft For Skin & Subcutaneous Tissue Diagnoses	361
<b>Syncope &amp; Collapse</b>	Syncope & Collapse	204
<b>Tendon, Muscle, Soft Tis</b>	Tendon, Muscle & Other Soft Tissue Procedures	317

# Technical Appendix:

## Exhibit B. Diagnosis Related Groups (DRGs)

<b>Thyroid &amp; Other Procs</b>	Thyroid, Parathyroid & Thyroglossal Procedures	404
<b>Vaginal Delivery</b>	Vaginal Delivery	560

# Technical Appendix:

## Exhibit C. Special Public Funding

**Delivery System Transformation Initiatives (DSTI)** is a federal-state partnership that provides incentive payments to support and reward seven safety net hospitals in Massachusetts for investing in integrated care, quality innovations, and infrastructure to support alternative payment models. The DSTI amounts listed in the table below are payments distributed in FY2015.

**Infrastructure & Capacity Building (ICB)** program is a federal and state-funded program administered by MassHealth to help hospitals transition to integrated delivery systems that provide more effective and cost-efficient care to patients in need. The ICB amounts listed below represent awards in FY15. Hospitals may have received ICB funding in prior years, which would be reflected on their individual profile but excluded from the table below.

The **Community Hospital Acceleration, Revitalization, and Transformation Investment Program (CHART)** is a four-year, \$120M program funded by an industry assessment of select providers and insurers and administered by the Health Policy Commission that makes phased investments to promote efficient, effective care delivery in non-profit, non-teaching, lower cost community hospitals.

Hospital	DSTI (FY15)	ICB (FY15)*	CHART (Phase I)	CHART (Phase II)**
Anna Jaques Hospital		\$747,238	\$333,500	\$1,200,000
Athol Hospital			\$484,128	Joint award. See below.
Baystate Franklin Medical Center			\$476,400	\$1,800,000
Baystate Mary Lane Hospital			\$499,600	
Baystate Medical Center			<i>Ineligible</i>	<i>Ineligible</i>
Baystate Noble Hospital			\$344,665	\$1,200,000
Baystate Wing Hospital			\$357,000	\$1,000,000
Berkshire Medical Center		\$723,671	<i>Ineligible</i>	\$3,000,000
Beth Israel Deaconess Hospital – Milton			\$261,200	\$2,000,000
Beth Israel Deaconess Hospital – Needham			\$300,000	
Beth Israel Deaconess Hospital – Plymouth		\$472,750	\$245,818	\$3,700,000
Beth Israel Deaconess Medical Center		\$286,284	<i>Ineligible</i>	<i>Ineligible</i>
Boston Children’s Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Boston Medical Center	\$103,553,333		<i>Ineligible</i>	<i>Ineligible</i>
Brigham and Women’s Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Cambridge Health Alliance	\$44,853,333		<i>Ineligible</i>	<i>Ineligible</i>
Cape Cod Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Clinton Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Cooley Dickinson Hospital		\$58,202	<i>Ineligible</i>	<i>Ineligible</i>
Dana-Farber Cancer Institute			<i>Ineligible</i>	<i>Ineligible</i>
Emerson Hospital			\$202,575	\$1,200,000
Fairview Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Falmouth Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Brigham and Women’s Faulkner Hospital			<i>Ineligible</i>	<i>Ineligible</i>
Hallmark Health			\$749,360	\$2,500,000
Harrington Memorial Hospital		\$383,887	\$491,600	\$3,500,000
HealthAlliance Hospital			\$410,000	\$3,800,000
Heywood Hospital		\$319,692	\$316,384	Joint award. See below.
Holyoke Medical Center	\$8,153,333	\$129,629	\$500,000	\$3,900,000
Kindred Hospital – Boston			<i>Ineligible</i>	<i>Ineligible</i>
Kindred Hospital – Boston North Shore			<i>Ineligible</i>	<i>Ineligible</i>

# Technical Appendix:

## Exhibit C. Special Public Funding

<b>Lahey Hospital &amp; Medical Center</b>		\$908,882	<i>Ineligible</i>	<i>Ineligible</i>
<b>Lawrence General Hospital</b>	\$14,433,333		\$100,000	\$1,482,654
<b>Lowell General Hospital</b>		\$548,539	\$497,900	\$1,000,000
<b>Marlborough Hospital</b>		\$39,356		\$1,200,000
<b>Martha's Vineyard Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Massachusetts Eye and Ear Infirmary</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Massachusetts General Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Mercy Medical Center</b>	\$15,213,333		\$233,134	\$1,300,000
<b>MetroWest Medical Center</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Milford Regional Medical Center</b>		\$154,002	\$499,810	\$1,300,000
<b>Mount Auburn Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Nantucket Cottage Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>New England Baptist Hospital</b>				
<b>Newton-Wellesley Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>North Adams Regional Hospital</b>			\$395,311	<i>Ineligible</i>
<b>North Shore Medical Center</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Northeast Hospital</b>			\$359,000	\$3,769,057
<b>Saint Vincent Hospital</b>			<i>Ineligible</i>	
<b>Shriners Hospital for Children – Boston</b>				
<b>Shriners Hospital for Children – Springfield</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Signature Healthcare Brockton Hospital</b>	\$16,713,333		\$438,400	\$3,500,000
<b>South Shore Hospital</b>		\$320,548	<i>Ineligible</i>	<i>Ineligible</i>
<b>Southcoast Hospitals Group</b>			\$1,183,357	Joint award. See below.
<b>Steward Carney Hospital</b>	\$6,413,333		<i>Ineligible</i>	<i>Ineligible</i>
<b>Steward Holy Family Hospital</b>		\$796,026	<i>Ineligible</i>	<i>Ineligible</i>
<b>Steward Good Samaritan Medical Center</b>		\$616,196	<i>Ineligible</i>	<i>Ineligible</i>
<b>Merrimack Valley Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Morton Hospital</b>		\$309,706	<i>Ineligible</i>	<i>Ineligible</i>
<b>Nashoba Valley Medical Center</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Steward Norwood Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Steward Saint Anne's Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Steward St. Elizabeth's Medical Center</b>		\$1,668,229	<i>Ineligible</i>	<i>Ineligible</i>
<b>Sturdy Memorial Hospital</b>			<i>Ineligible</i>	<i>Ineligible</i>
<b>Tufts Medical Center</b>		\$641,501	<i>Ineligible</i>	<i>Ineligible</i>
<b>UMass Memorial Medical Center</b>		\$1,398,152	<i>Ineligible</i>	<i>Ineligible</i>
<b>Winchester Hospital</b>			\$286,500	\$1,000,000
<b>TOTAL</b>	<b>\$209,333,333</b>	<b>\$11,131,266</b>	<b>\$9,965,642</b>	<b>\$43,351,711</b>

\*Franciscan Hospital for Children, a non-acute specialty hospital, received \$188,777 in ICB funding for FY15

\*\*CHART Phase II Joint Proposals were awarded to:

Athol Memorial Hospital, Heywood Hospital, and HealthAlliance Hospital: \$2,900,000

Addison Gilbert Hospital, Beverly Hospital, Winchester Hospital, and Lowell General Hospital: \$4,800,000

Southcoast Hospitals Group - Charlton Memorial Hospital, Tobey Hospital, and St. Luke's Hospital: \$8,000,000

Hallmark Health - Melrose-Wakefield Hospital and Lawrence Memorial Hospital: \$2,500,000

Baystate Franklin Medical Center, Baystate Mary Lane Hospital and Baystate Wing Hospital: \$900,000

CHART Phase II awards were initially attributed to hospitals in FY14, the fiscal year in which they were awarded. The award is then disbursed over several fiscal years.