BRIEF

Illuminating the Impact of COVID-19 on Hospitals and Health Systems

A Comparative Study of Revenue and Utilization

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Summary

In response to the COVID-19 pandemic, hospitals and health systems have had to defer many elective procedures, both to free up resources and to limit the spread of the novel coronavirus that causes COVID-19. That deferral has been a financial strain on these facilities, as has a reduction in the number of patients seeking emergency care for non-COVID-19 reasons. To investigate the financial impact of COVID-19 on hospitals and health systems, FAIR Health compared estimated allowed amounts[1] on private insurance claims submitted by facilities in the first quarter (January to March) of 2020, when COVID-19 emerged in the United States, with the first quarter of 2019 (adjusted by Consumer Price Index). FAIR Health also compared nationwide findings with those in the hardest-hit region, the Northeast.[2] Analyzed as well were discharge volume, settings, and diagnoses and procedures. Among the findings:

- In general, there was an association between larger facility size and greater impact from COVID-19. Nationally, in large facilities (over 250 beds), average per-facility revenues based on estimated allowed amounts declined from $4.5 million in the first quarter of 2019 to $4.2 million in the first quarter of 2020. The gap was less pronounced in midsize facilities (101 to 250 beds) and not evident in small facilities (100 beds or fewer).
- March was the month in the first quarter of 2020 when COVID-19 had its greatest impact. A decrease in average per-facility revenues based on estimated allowed amounts in the first quarter of 2020 from the first quarter of 2019 did not occur until March. Nationally, in that month, in midsize facilities, the decrease was four percent; in large facilities, five percent.
- Facilities in the Northeast experienced a greater impact from COVID-19 than those in the nation as a whole. For example, in the Northeast, the decline in average per-facility revenues based on estimated allowed amounts in March 2020 was sharper than nationally. In March 2020 in the Northeast, the decrease from March 2019 was five percent for midsize facilities, nine percent for large ones.
- Nationally and in the Northeast, the third week of March 2020 was the week with the greatest declines in average per-facility revenues based on estimated allowed amounts from the corresponding week in 2019. In large facilities nationally, the decrease was 16 percent; in the Northeast, 26 percent.
- In both the nation and the Northeast, the decrease in facility discharge volume from March 2019 to March 2020 was greater on a percentage basis than the decrease in revenues based on estimated allowed amounts. For example, in large facilities nationally, the drop in volume was 32 percent; in the Northeast, 40 percent.
- Nationally, the decrease in facility discharge volume in the third week of March 2020 from the corresponding week in 2019 was greater than in any other week of the month. But in the Northeast, in midsize facilities, the fourth week of March had a greater drop (34 percent) than the third week (30 percent).
- From March 2019 to March 2020, the outpatient share of the distribution of estimated allowed amounts by settings decreased relative to the inpatient share. The effect was more pronounced in the Northeast than nationally. In the Northeast, the outpatient share fell from 70 percent to 58 percent, while the inpatient share rose from 22 percent to 33 percent (with emergency room [ER] visits constituting the remainder in both cases).

[1] An allowed amount is the total fee negotiated between an insurance plan and a provider for an in-network service. Because payors' contracted network rates are proprietary, FAIR Health employs an imputation methodology to determine benchmarks for allowed amounts. First, FAIR Health calculates the ratios of actual allowed amounts to charges for groups of procedure codes on a regional basis. The resulting ratios are applied to the actual charges for each specific procedure at the local (geozip) level to develop an "imputed" or "estimated" allowed amount for each claim line.

[2] The US census region of the Northeast comprises Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

- The third and fourth weeks of March 2020, compared to the corresponding period in 2019, saw several changes in the most common diagnostic categories in the inpatient and ER settings. Nationally and in the Northeast, in the inpatient setting, diseases and disorders of the respiratory system rose in share of distribution by volume and estimated allowed dollars, while in the ER setting, acute respiratory diseases and infections rose.

Background

The COVID-19 pandemic is severely testing the US healthcare system. More than a million cases of COVID-19 have flooded the system, causing shortages of beds, personal protective equipment, ventilators and other resources. Physicians trained in critical care have been in short supply, prompting some institutions to recruit help from other disciplines.[3] In addition, federal authorities[4,5] and professional associations[6] have called for the deferral of elective procedures, both to free up resources and to limit the spread of the novel coronavirus that causes COVID-19. Several governors have issued executive orders canceling elective procedures in their states.[7]

The deferral of elective procedures has resulted in a financial strain on hospitals and health systems, which rely on such procedures for a large part of their income. At the same time that hospitals and health systems have had to increase expenditures for COVID-19-related resources, they have been losing vital revenue. The extent of these losses has been widely discussed,[8,9] but is not clear. Reports have variously claimed that hospital revenue could be cut 40 percent[10] to 51 percent[11] because of cancellation of elective procedures. Moreover, it is not evident that revenue from COVID-19 cases would offset those losses. One study found that, even with the 20 percent increase in Medicare reimbursement for COVID-19 cases mandated by the CARES Act,[12] health systems would lose an average of about $1,200 per COVID-19 case and up to $6,000 to $8,000 per case for some systems, depending on payor mix.[13]

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[3] Tara Bannow and Maria Castellucci, "Hospitals Redeploy Specialists to COVID-19 Front Lines," *Modern Healthcare*, March 30, 2020, https://www.modernhealthcare.com/hospitals/hospitals-redeploy-specialists-covid-19-front-lines?utm_source=modern-healthcare-daily-dose&utm_medium=email&utm_campaign=20200330&utm_content=article1-readmore.
[4] Susannah Luthi, "Surgeon General Advises Hospitals to Cancel Elective Surgeries," Politico, March 14, 2020, https://www.politico.com/news/2020/03/14/surgeon-general-elective-surgeries-coronavirus-129405.
[5] Centers for Medicare & Medicaid Services (CMS), "Non-Emergent, Elective Medical Services, and Treatment Recommendations," April 7, 2020, https://www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf.
[6] American College of Surgeons, "COVID-19: Recommendations for Management of Elective Surgical Procedures," March 13, 2020, https://www.facs.org/-/media/files/covid19/recommendations_for_management_of_elective_surgical_procedures.ashx.
[7] Eric Oliver, "27 States Canceling Elective Procedures," *Becker's ASC Review*, March 26, 2020, https://www.beckersasc.com/asc-news/27-states-canceling-elective-procedures.html.
[8] Dhruv Khullar, Amelia M. Bond and William L. Schpero, "COVID-19 and the Financial Health of US Hospitals," *JAMA*, May 4, 2020, https://www.doi.org/10.1001/jama.2020.6269.
[9] American Hospital Association, "Hospitals and Health Systems Face Unprecedented Financial Pressures Due to COVID-19," May 2020, https://www.aha.org/system/files/media/file/2020/05/aha-covid19-financial-impact-0520-FINAL.pdf.
[10] Allison Bell, "What If COVID-19 Lowers Health Claims?," ThinkAdvisor, April 9, 2020, https://www.thinkadvisor.com/2020/04/09/what-if-covid-19-lowers-health-claims/.
[11] HFN Staff, "Hospitals Furlough Staff, Reduce Physician Salaries Waiting for CARES Act Funds," Healthcare Finance, April 6, 2020, https://www.healthcarefinancenews.com/news/hospitals-furlough-staff-reduce-physician-salaries-waiting-cares-act-funds.
[12] Coronavirus Aid, Relief and Economic Security (CARES) Act, Pub. L. No. 116-136.
[13] Strata Decision Technology, "Report: Hospitals Face Massive Losses on Covid-19 Cases Even with Proposed Increase in Federal Reimbursement," March 24, 2020, https://www.stratadecision.com/blog/report-hospitals-face-massive-losses-on-covid-19-cases-even-with-proposed-increase-in-federal-reimbursement/.

Hospitals may also be losing revenue from a widespread decrease in the number of patients visiting emergency rooms (ERs) for non-COVID-19 care.[14] Many patients who would have otherwise gone to the ER have stayed away, presumably out of fear of catching COVID-19.

To investigate the financial impact of COVID-19 on hospitals and health systems due to deferral of elective and emergency services, FAIR Health analyzed data from its database of over 31 billion private healthcare claims, the largest such repository in the nation. This study follows FAIR Health's previous brief on the potential cost to the nation of inpatient services for those with COVID-19 and on the role of telehealth in the pandemic.[15]

In the present study, FAIR Health compares estimated allowed amounts on private insurance claims submitted by facilities in the first quarter of 2020, the period when COVID-19 was emerging in the United States, with the first quarter of 2019. The first three months of 2020 were not all alike. The first US case was reported in January; by the end of February there had been over 60 cases[16]; and by the end of March there had been a greater than 3,000-fold increase, to over 185,000 cases.[17] Because March was the month when the outbreak most dramatically escalated, it was also the month when social distancing,[18] stay-at-home orders[19] and cancellation of elective procedures[20] became widespread in response. Thus, it can be expected that any decline in estimated allowed amounts would have been most pronounced in March. In this study, a month-by-month analysis is conducted to determine if that was the case.

March itself was not uniform. According to the Centers for Disease Control and Prevention, the first day with more than a thousand new reported cases of COVID-19 was March 15, the start of the third week of March.[21] After that, days with thousands of new cases became common, as did measures to fight the pandemic, such as cancellation of elective procedures. It can be predicted that decreases in estimated allowed amounts would be greater beginning in the third week of March. To search for that effect, this study conducts a week-by-week analysis in March.

Although the COVID-19 outbreak affects all parts of the nation, some regions felt it more strongly than others in March. The Northeast was hit hardest, particularly New York State, in which New York City became the national epicenter of the outbreak.[22] New York State and other northeastern states enacted

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[14] William Feuer, "Doctors Worry the Coronavirus Is Keeping Patients Away from US Hospitals as ER Visits Drop: 'Heart Attacks Don't Stop,'" CNBC, April 14, 2020, https://www.cnbc.com/2020/04/14/doctors-worry-the-coronavirus-is-keeping-patients-away-from-us-hospitals-as-er-visits-drop-heart-attacks-dont-stop.html.

[15] FAIR Health, *COVID-19: The Projected Economic Impact of the COVID-19 Pandemic on the US Healthcare System*, A FAIR Health Brief, March 25, 2020, https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/COVID-19%20-%20The%20Projected%20Economic%20Impact%20of%20the%20COVID-19%20Pandemic%20on%20the%20US%20Healthcare%20System.pdf.

[16] Eric Boodman and Helen Branswell, "First Covid-19 Outbreak in a U.S. Nursing Home Raises Concerns," STAT, February 29, 2020, https://www.statnews.com/2020/02/29/new-covid-19-death-raises-concerns-about-virus-spread-in-nursing-homes/.

[17] Julia Hollingsworth et al., "March 31 Coronavirus News," CNN, March 31, 2020, https://www.cnn.com/world/live-news/coronavirus-pandemic-03-31-20/index.html.

[18] Nina Bai, "Why Experts Are Urging Social Distancing to Combat Coronavirus Outbreak," University of California San Francisco News & Media, March 14, 2020, https://www.ucsf.edu/news/2020/03/416906/why-experts-are-urging-social-distancing-combat-coronavirus-outbreak.

[19] Sarah Mervosh et al., "See Which States Are Reopening and Which Are Still Shut Down," *New York Times*, May 1, 2020, https://www.nytimes.com/interactive/2020/us/states-reopen-map-coronavirus.html.

[20] Oliver, "27 States Canceling Elective Procedures."

[21] Centers for Disease Control and Prevention (CDC), "Coronavirus Disease 2019 (COVID-19)—Cases in the U.S.," last updated on May 1, 2020, https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html.

[22] Eric Levenson, "Why New York is the Epicenter of the American Coronavirus Outbreak," CNN, March 26, 2020, https://www.cnn.com/2020/03/26/us/new-york-coronavirus-explainer/index.html.

some of the strictest measures in the country to limit spread of the novel coronavirus.[23] The expectation is that decreases in estimated allowed amounts would be greater in the Northeast than in the nation as a whole. To investigate that aspect, this study compares nationwide findings with those in the Northeast.

Also analyzed in this study is the impact of COVID-19 on facility discharge volume, distribution of settings (inpatient, outpatient and ER), and diagnoses and procedures in those settings.

A national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information, FAIR Health based this study on its repository of private healthcare claims data. The data are contributed by over 60 payors and administrators who insure or process claims for private insurance plans covering more than 150 million individuals—an estimated 75 percent of the nation's privately insured population. The dataset includes data on fully insured and employer self-funded plans and Medicare Advantage (Medicare Part C) enrollees, but not on uninsured individuals or those on Medicare Parts A, B and D.[24] Those insured under other government programs, such as Medicaid, CHIP, and state and local government programs, are also not included. In addition, this study excludes services for which claims were not submitted to a commercial insurer or administrator. For example, some elective procedures, such as those that are cosmetic in nature, are not covered by commercial insurance and would not be included in the FAIR Health database.

Because the data for this report reflect the privately insured population, the report focuses on allowed amounts, the total fees negotiated between insurance plans and providers for in-network services. Allowed revenue likely provides a better approximation of the overall revenues realized by providers for the privately insured population. FAIR Health also receives data on charges, the non-discounted amounts that providers bill for services to patients who are uninsured or receiving out-of-network care.[25] Because providers typically do not collect the full amount of their list charges for care provided to the privately insured population, charges are not a focus of this report, though findings related to charges can be found in the footnotes.

Methodology

From its repository of private claims, FAIR Health retrieved data for January through March 2020 that were submitted to FAIR Health through the end of April. FAIR Health also retrieved claims data from the first three months of 2019 (i.e., with dates of service from January through March), obtaining only those data that were submitted to FAIR Health from January 1, 2019, to April 30, 2019. This restriction meant that the data would be subject to the same incurred but not reported (IBNR) conditions as the data retrieved for the corresponding time period in 2020, providing an "apples to apples" comparison of the lag in filing claims.[26] It was assumed that the rate of IBNR was the same in 2020 as in 2019.[27]

Due to IBNR claims, the data for both quarters were incomplete, particularly for the fourth week of March, although the data were statistically significant for all weeks. Because of the substantial amount of data

[23] Casey Leins, "10 States with the Most Aggressive Response to COVID-19," *U.S. News & World Report*, March 17, 2020, https://www.usnews.com/news/best-states/articles/2020-03-17/10-states-with-the-most-aggressive-response-to-coronavirus.
[24] FAIR Health also receives the entire collection of claims for traditional Medicare Parts A, B and D under the CMS Qualified Entity Program, but those data are not a source for this report.
[25] Hospitals (particularly those tax-exempt) may reduce out-of-network and uninsured charge-based bills for lower-income patients.
[26] IBNR claims are valid claims for covered services that have been performed but not yet reported to the insurer.
[27] FAIR Health's data contribution program did not change from 2019 to 2020 and FAIR Health received all the contributions expected through the end of April 2020. The contributors were the same in the first quarter of 2019 as in the first quarter of 2020.

available and the importance of the findings to public health and policy discussions, FAIR Health deemed it worthwhile to release the study at this stage.

The data were separated into the weeks of the year. Facility data were segregated from professional data based on the form type of the claim: UB-04s were categorized as facility and CMS-1500s as professional. Facility claims were further broken into:

- Facility inpatient—bill types of 11X and 12X;
- Facility ER—revenue code of 045X[28];
- Facility outpatient—bill type of 13X; and
- Facility laboratory—bill type of 14X (included in the outpatient setting in this report).

Data were then analyzed per facility, per week of data, per month of data and for the entire quarter. Facilities were striated into regions and bed sizes. Total charges and estimated allowed amounts associated with each facility on a weekly basis were calculated. The Consumer Price Index (CPI) was used to adjust the 2019 numbers to reduce any confounding variables of chargemaster increases between 2019 and 2020 or rate negotiations between the two years.[29] Series ID CUSR0000SEMD01 was used, which is the seasonally adjusted US hospital services average medical index rate by month. The 2020 value was divided by the 2019 value (as the 2019 value is the base year) to obtain the following:

Table 1. Consumer Price Index values, January-March 2019, 2020

	January	February	March
2019	335.961	334.137	335.188
2020	348.876	348.447	349.824
CPI Value Used against 2019	1.038442	1.042827	1.04367

The data were evaluated to see the percentage change between the two time series amounts from each year. For the comparison of quarter to quarter, month to month and week to week, a standard percentage change formula was used:

$$\frac{Quarter1Amount_{2020} - (Quarter1Amount_{2019} \times CPIValue_{Average})}{(Quarter1Amount_{2019} \times CPIValue_{Average})} = PercentageChange$$

$$\frac{MonthAmount_{2020} - (MonthAmount_{2019} \times CPIValue_{Month})}{(MonthAmount_{2019} \times CPIValue_{Month})} = PercentageChange$$

[28] UB-04 Manual. THE UB-04 DATA FILE, 2020, is copyrighted by American Hospital Association ("AHA"), Chicago, Illinois. No portion of THE UB-04 DATA FILE may be reproduced, sorted in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior express, written consent of AHA.
[29] US Bureau of Labor Statistics, "Series Report," https://data.bls.gov/cgi-bin/srgate.

$$\frac{WeekAmount_{2020} - (WeekAmount_{2019} \times CPIValue_{Month})}{(WeekAmount_{2019} \times CPIValue_{Month})} = PercentageChange$$

Where:

$Quarter1Amount_{2020}$ is the quarterly per-facility average charge or allowed amount calculated for the first quarter in 2020.

$Quarter1Amount_{2019}$ is the quarterly per-facility average charge or allowed amount calculated for the first quarter in 2019.

$CPIValue_{Average}$ is the average CPI value across January, February and March.

$MonthAmount_{2020}$ is the individual month per-facility average charge or allowed amount calculated for the month in 2020.

$MonthAmount_{2019}$ is the individual month per-facility average charge or allowed amount calculated for the month in 2019.

$CPIValue_{Month}$ is the CPI value for the associated month.

$WeekAmount_{2020}$ is the individual weekly per-facility average charge or allowed amount calculated for the week in 2020.

$WeekAmount_{2019}$ is the individual weekly per-facility average charge or allowed amount calculated for the week in 2019.

The distribution of estimated allowed amounts was analyzed by ER, inpatient and outpatient settings. In the inpatient setting, data were further analyzed by the major diagnostic categories (MDCs) of the Centers for Medicare & Medicaid Services (CMS) diagnosis-related groups (DRGs). In the ER setting, data were analyzed on the basis of ICD-10-CM diagnosis codes. In the outpatient setting, data were analyzed by procedure categories, using the American Medical Association mid-level categorization and the CMS HCPCS mid-level categorization from the CPT®[30] 2020 Professional Edition code book and HCPCS Level II code book. Procedure categories rather than diagnostic categories were used for the outpatient setting because they better captured the distribution of services in that setting.

[30] CPT © 2019 American Medical Association (AMA). All rights reserved.

Results

Allowed Amounts by Quarter

A national comparison of the first quarters of CPI-adjusted 2019 and 2020 shows a decline in revenues based on estimated allowed amounts that is related to larger bed size (figure 1). In small facilities—those with 100 beds or fewer—the 2019 and 2020 average per-facility revenues based on estimated allowed amounts were approximately equal ($0.3 million). In midsize facilities (101 to 250 beds), the 2020 average ($1.2 million) was lower than in 2019 ($1.3 million). In large facilities (over 250 beds), the gap was even greater: $4.2 million in 2020 compared to $4.5 million in 2019.[31]

There may be several reasons why larger facilities would show a greater impact from COVID-19 than smaller ones. It is possible that larger facilities schedule more elective surgeries that would have to be deferred in the face of the pandemic. Larger facilities also may be located in larger cities, which may be more susceptible to spread of COVID-19 and more likely to be the site of countermeasures such as deferral of elective procedures.

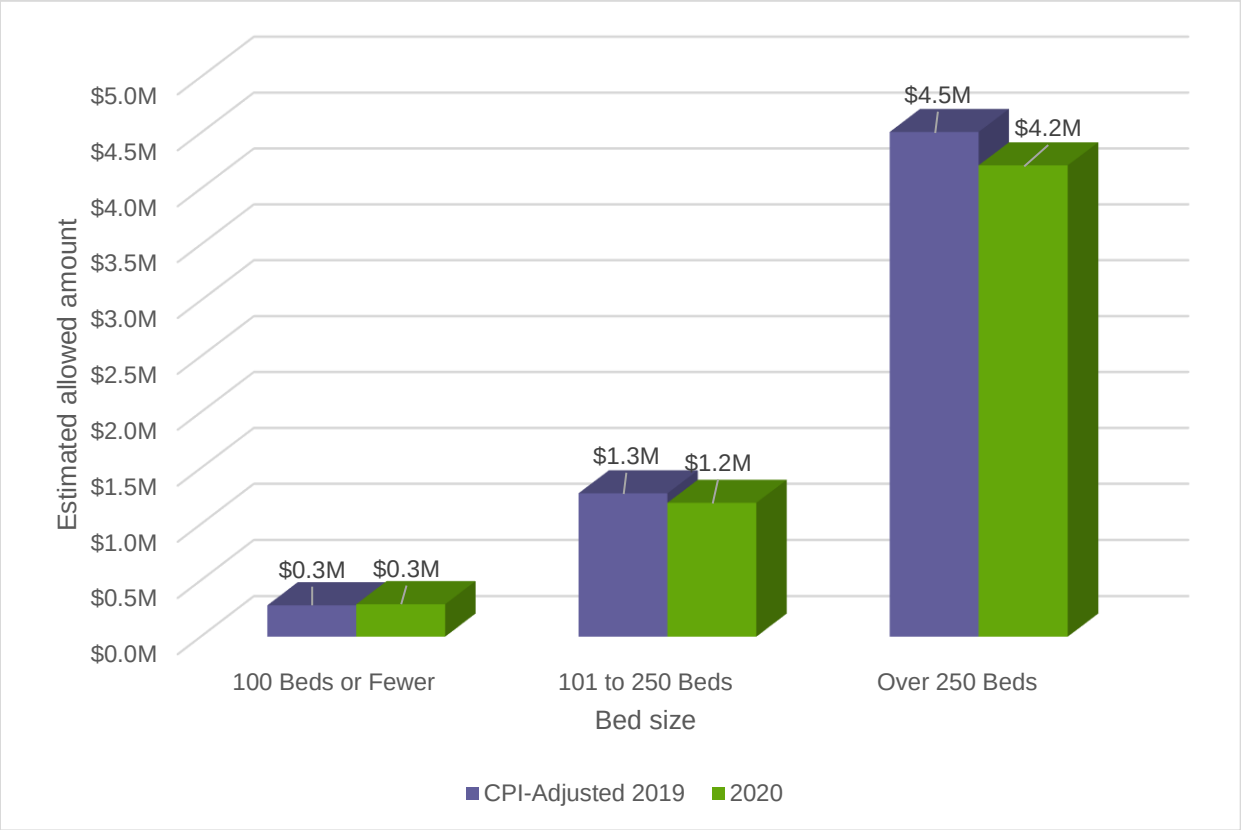

Figure 1. Average per-facility revenues based on estimated allowed amounts by bed size, first quarter CPI-adjusted 2019 vs. first quarter 2020, nationally

[31] Similar results were found with charge amounts in the first quarters of CPI-adjusted 2019 and 2020 nationally. In facilities with 100 beds or fewer, the 2019 and 2020 average per-facility estimated charges were approximately equal ($0.5 million). In facilities with 101 to 250 beds, the 2020 average ($2.3 million) was lower than in 2019 ($2.4 million). In facilities with over 250 beds, the 2020 average was $8.1 million compared to $8.6 million in 2019.

Allowed Amounts and Discharge Volume by Month

Analysis of the data on a monthly basis makes it possible to learn with greater specificity when the impact of COVID-19 was felt in the first quarter of 2020. Figure 2 shows, on a national scale, monthly percent change in average per-facility revenues based on estimated allowed amounts from CPI-adjusted 2019 to 2020. A decrease in revenues did not occur until March 2020, and then only in midsize and large facilities. In midsize facilities, the decrease was four percent; in large facilities, five percent.[32]

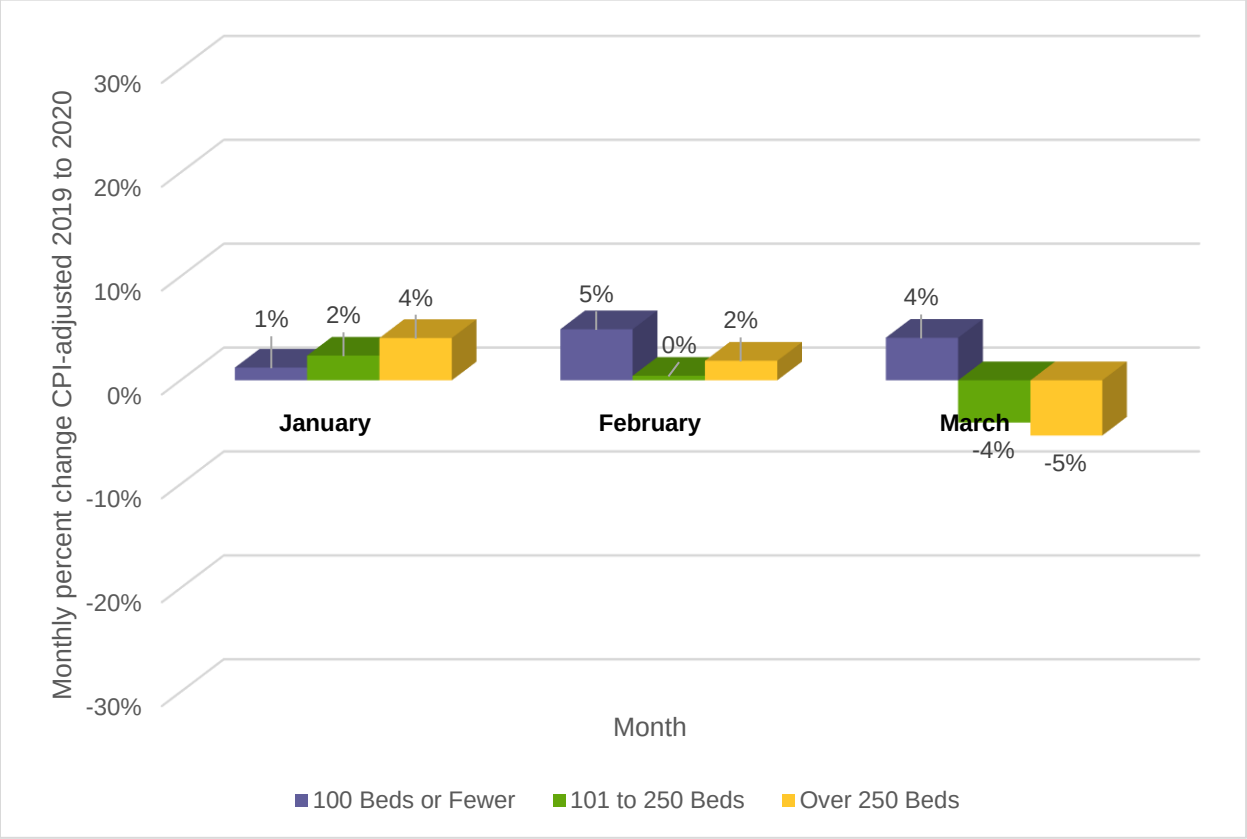

Figure 2. Monthly percent change in average per-facility revenues based on estimated allowed amounts from CPI-adjusted 2019 to 2020, by bed size, nationally

[32] In per-facility average charge amounts nationally, the percent decrease from March CPI-adjusted 2019 to March 2020 for midsize facilities was 9 percent and for large facilities 10 percent. Small facilities in March had zero percent change in charges. There was no decrease in charges in January or February.

As noted above, the COVID-19 outbreak hit the Northeast harder in March than the rest of the country, and state governments there responded with strict measures. As expected, the March 2020 decrease in average per-facility revenues based on estimated allowed amounts, compared to CPI-adjusted March 2019, was more pronounced in the Northeast (figure 3) than in the country as a whole. After a January and February in which revenues increased across bed sizes in the Northeast, March 2020 saw decreases in every facility size category. While small facilities nationally showed an increase in March 2020 (four percent, as shown in figure 2), small facilities in the Northeast showed a decrease of two percent. Midsize and large facilities in the Northeast had sharper decreases (respectively, five percent and nine percent) than their counterparts nationally (respectively, four percent and five percent, as shown in figure 2).[33]

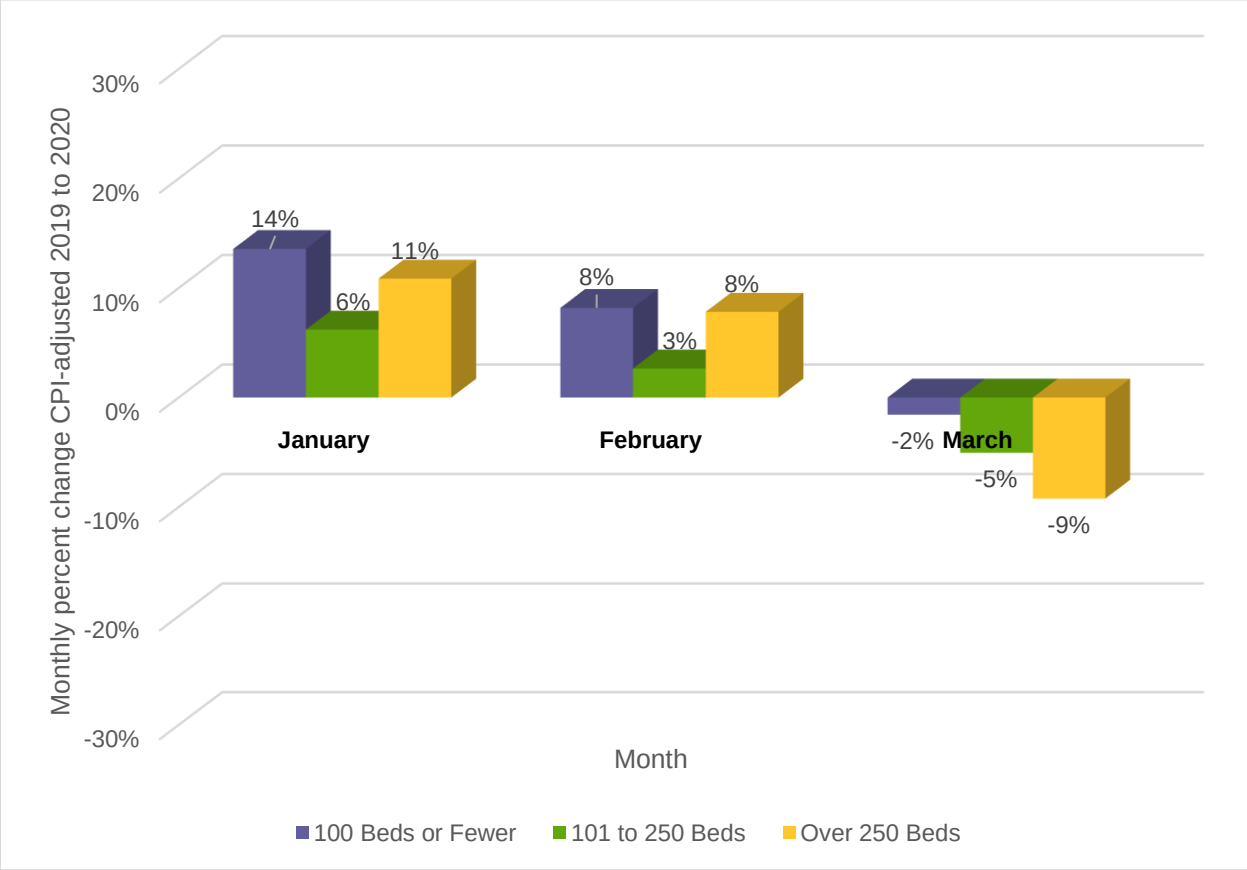

Figure 3. Monthly percent change in average per-facility revenues based on estimated allowed amounts from CPI-adjusted 2019 to 2020, by bed size, Northeast

[33] In per-facility average charge amounts in the Northeast, the percent decrease from March CPI-adjusted 2019 to March 2020 was 1 percent for small facilities, 8 percent for midsize facilities and 15 percent for large facilities. All bed sizes showed an increase in charge amounts in January and February.

Another measure of facility activity besides allowed amounts is discharge volume, which encompasses inpatient, outpatient (including laboratory) and ER settings. The decrease in facility discharge volume nationally from March 2019 to March 2020 (figure 4) was even greater on a percentage basis than the decrease in revenues based on estimated allowed amounts. This may be because there was a greater decline in relatively less expensive procedures (such as radiology and laboratory) that were equally weighted in volume but accounted for less in allowed amounts. Also, some of the more expensive inpatient procedures, especially those that were emergent or urgent, were still occurring even as the volume of other procedures was reduced.

Whereas little to no change was evident in January and February, in March small facilities fell 26 percent in discharge volume, midsize facilities 29 percent and large facilities 32 percent. As in the case of allowed amounts, decreases in discharge volume were larger with facility size.

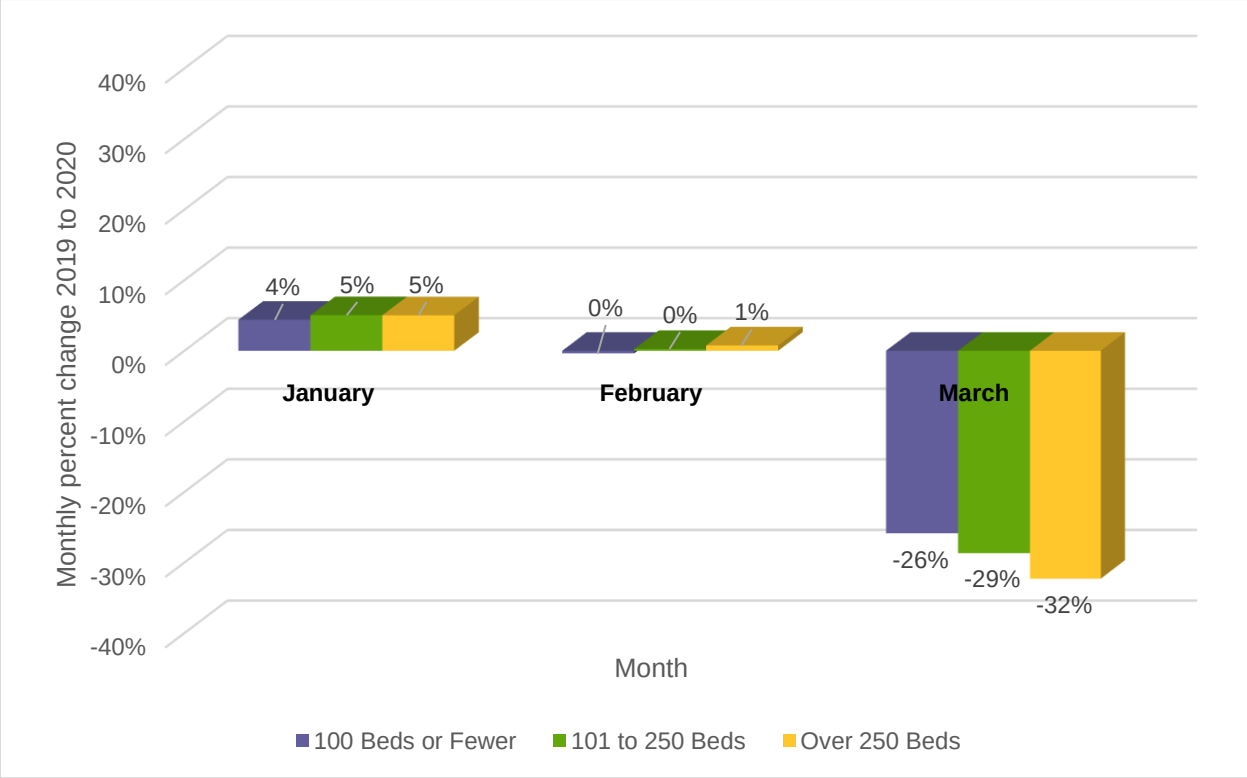

Figure 4. Monthly percent change in facility discharge volume from 2019 to 2020, by bed size, nationally

In the Northeast, the March decreases in facility discharge volume (figure 5) were even greater than nationally. From March 2019 to March 2020, small and midsize facilities both declined 34 percent in discharge volume, while large facilities dropped 40 percent. There was a much smaller decrease in discharge volume in February for small (three percent) and midsize (one percent) facilities.

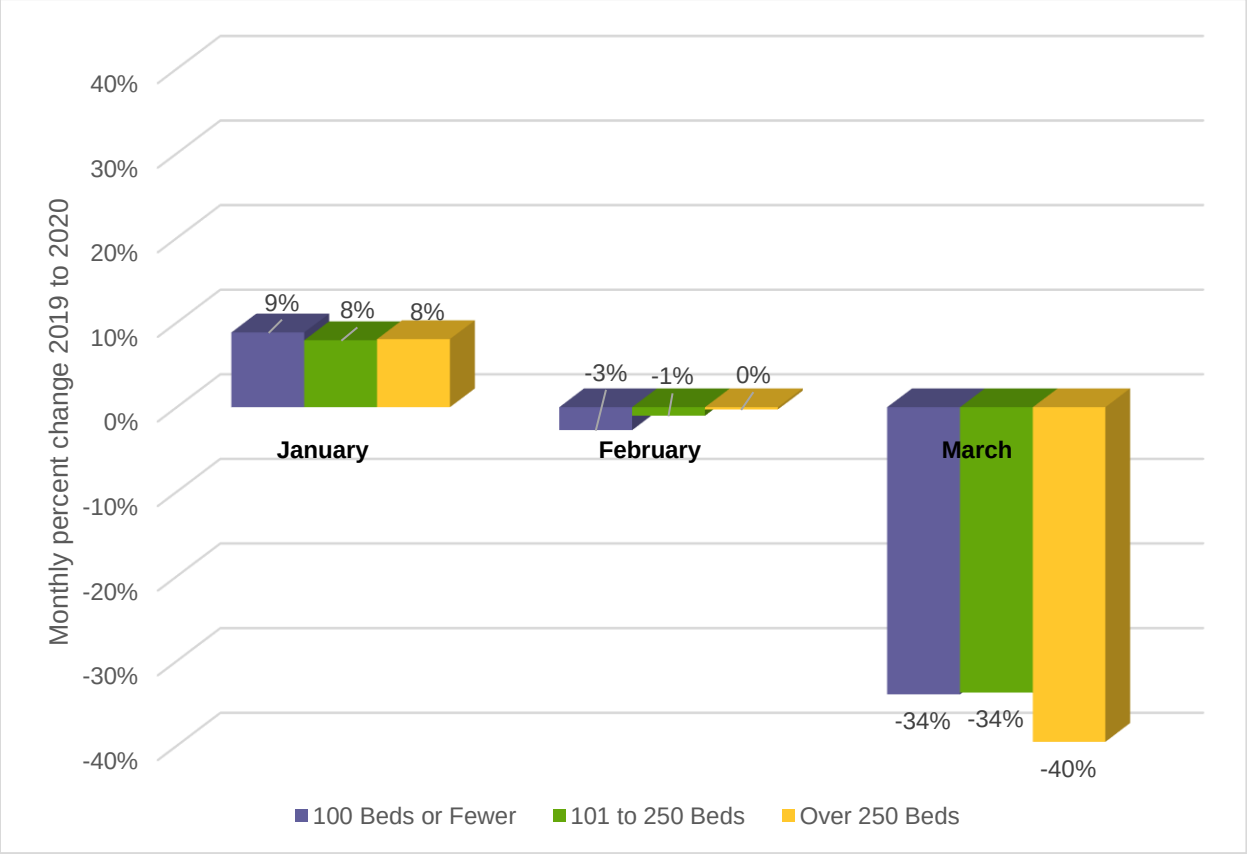

Figure 5. Monthly percent change in facility discharge volume from 2019 to 2020, by bed size, Northeast

Allowed Amounts and Discharge Volume by Week

As noted, the third week of March marked the start of an intensified phase of the COVID-19 outbreak, when days with thousands of new cases became common and measures to combat the pandemic multiplied. When the percent change in estimated allowed amounts from 2019 to 2020 is analyzed week by week in March, evidence can be found for the impact of this new phase. Figure 6 shows the weekly percent change in average per-facility revenues based on estimated allowed amounts from CPI-adjusted 2019 to 2020 for the first four weeks of March (i.e., the first 28 of the 31 days in the month). In small facilities, no decline occurred in any week of March, but in midsize and large facilities, there were declines in every week of March, with the greatest decline in week 3. In midsize facilities, the decrease in week 3 was 17 percent, followed by 5 percent in week 4; in large facilities, the decrease in week 3 was 16 percent, followed by 10 percent in week 4.[34]

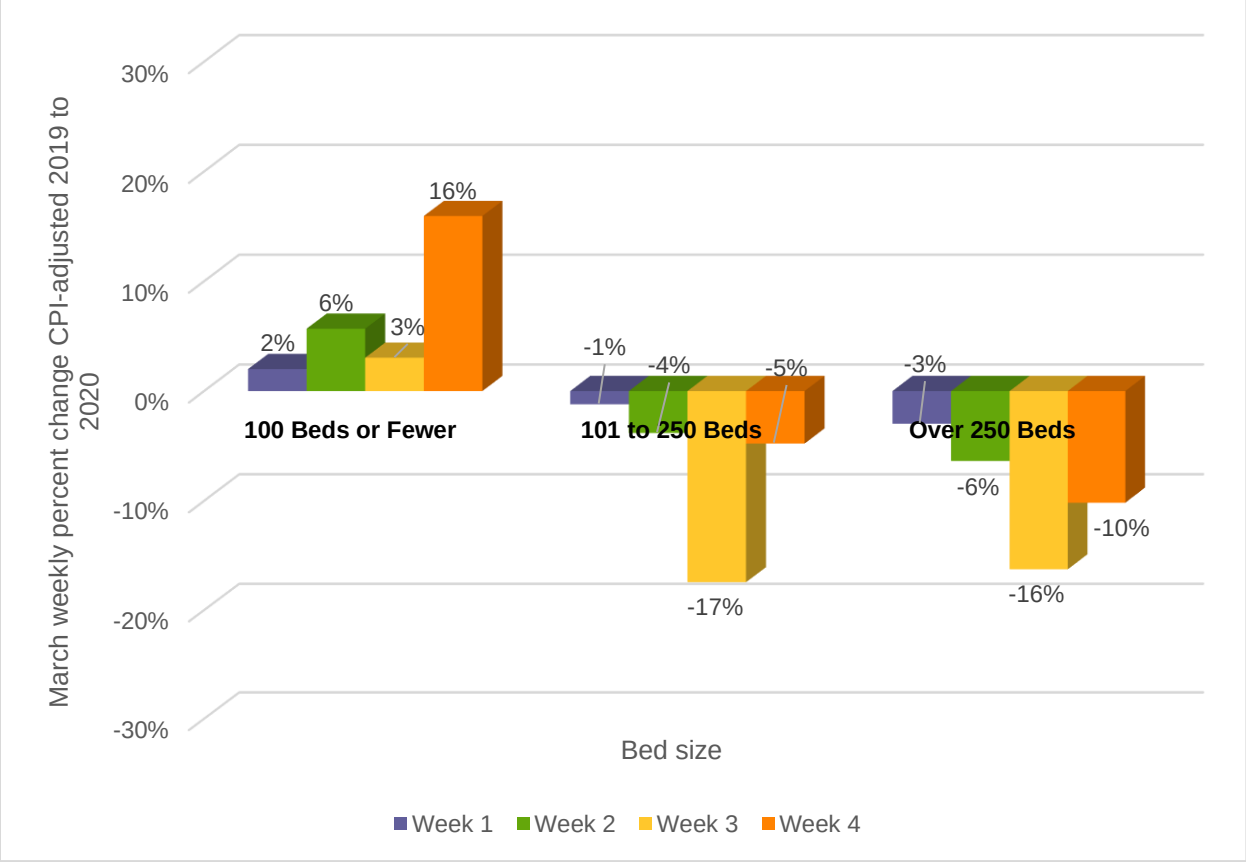

Figure 6. March weekly percent change in average per-facility revenues based on estimated allowed amounts from CPI-adjusted 2019 to 2020, by bed size, nationally

[34] In per-facility average charge amounts nationally, small facilities had a decrease from CPI-adjusted 2019 to 2020 in week 3 of 10 percent, midsize facilities 18 percent and large facilities 22 percent. In week 4, small facilities showed an increase of 10 percent, midsize facilities a decrease of 9 percent and large facilities a decrease of 15 percent.

Although the number of new cases per day of COVID-19 continued to rise in week 4,[35] the decrease in revenues based on estimated allowed amounts grew smaller. This may be because of a greater number of incurred but not reported (IBNR) claims in week 4, or it may be related to more claims being submitted for COVID-19.

In the Northeast, the third week of March was associated with even greater decreases in average per-facility revenues based on estimated allowed amounts (figure 7) than nationally. Unlike in the nation as a whole, small facilities in the Northeast showed a decrease (six percent) in week 3 of March from CPI-adjusted 2019 to 2020. Midsize and large facilities each fell 26 percent that week in 2020 as compared to the year before. In addition, there was less indication of recovery from the decrease in week 4. Small facilities had the same decrease in week 4 as in week 3 (six percent). In midsize facilities, week 4 saw a decrease of 23 percent; in large facilities, 24 percent.[36]

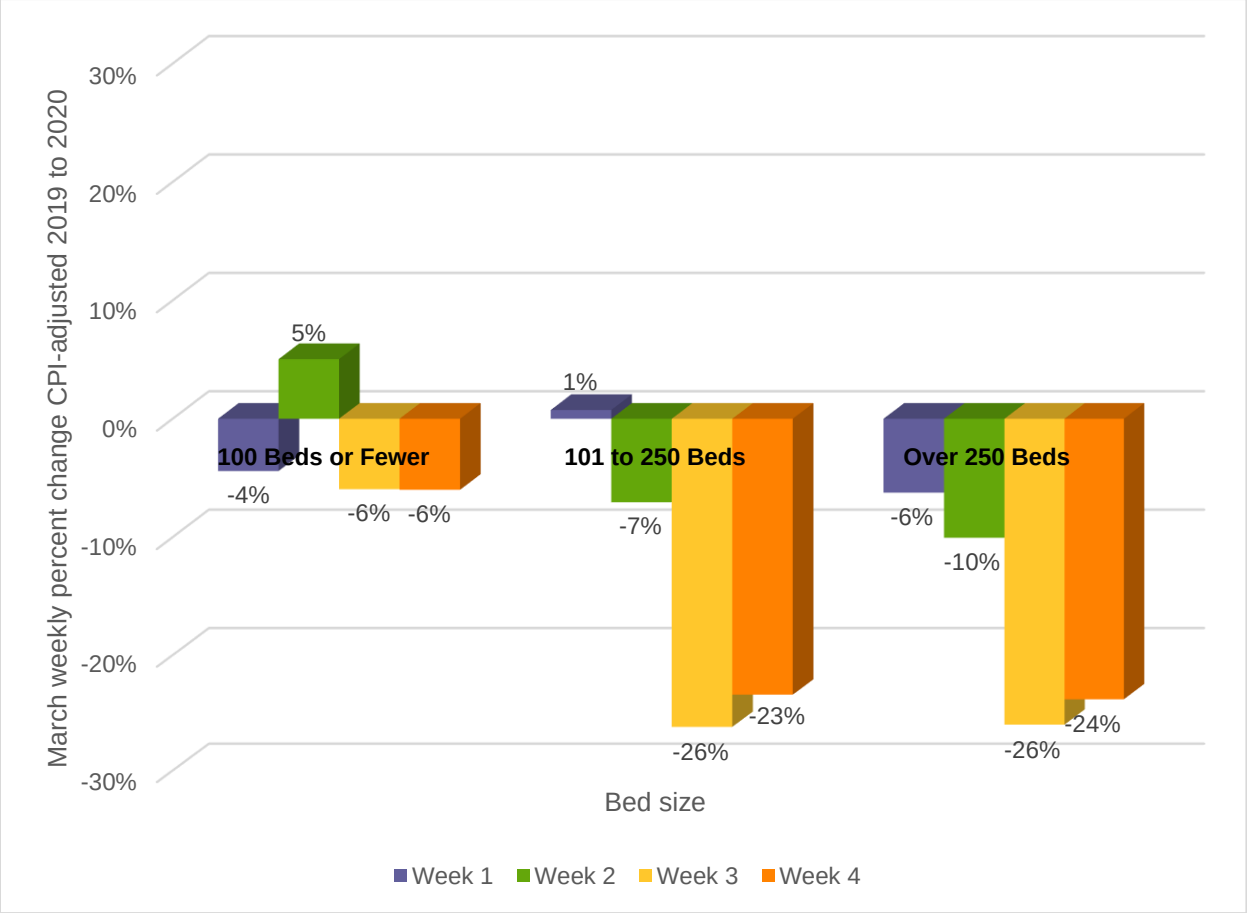

Figure 7. March weekly percent change in average per-facility revenues based on estimated allowed amounts from CPI-adjusted 2019 to 2020, by bed size, Northeast

[35] CDC, "Coronavirus Disease 2019 (COVID-19)—Cases in the U.S."

[36] With respect to per-facility average charge amounts in the Northeast, week 3 of March had the largest decreases from CPI-adjusted 2019 to 2020 in midsize (23 percent) and large facilities (35 percent), but not in small facilities. There the decrease in week 3 was 16 percent and the decrease in week 4 the largest at 30 percent. In midsize facilities, the decline in week 4 was 17 percent and, in large facilities, 32 percent.

The March weekly percent change in facility discharge volume from 2019 to 2020 (figure 8) is similar to that of revenues based on estimated allowed amounts in showing a greater decrease in the third week of March than any other week of that month nationally. Small facilities had a drop in week 3 of 15 percent; midsize, 26 percent; and large, 32 percent. In week 4, for small facilities, there was zero percent change; in midsize facilities, there was a decrease of 24 percent; and large facilities had a decrease of 26 percent.

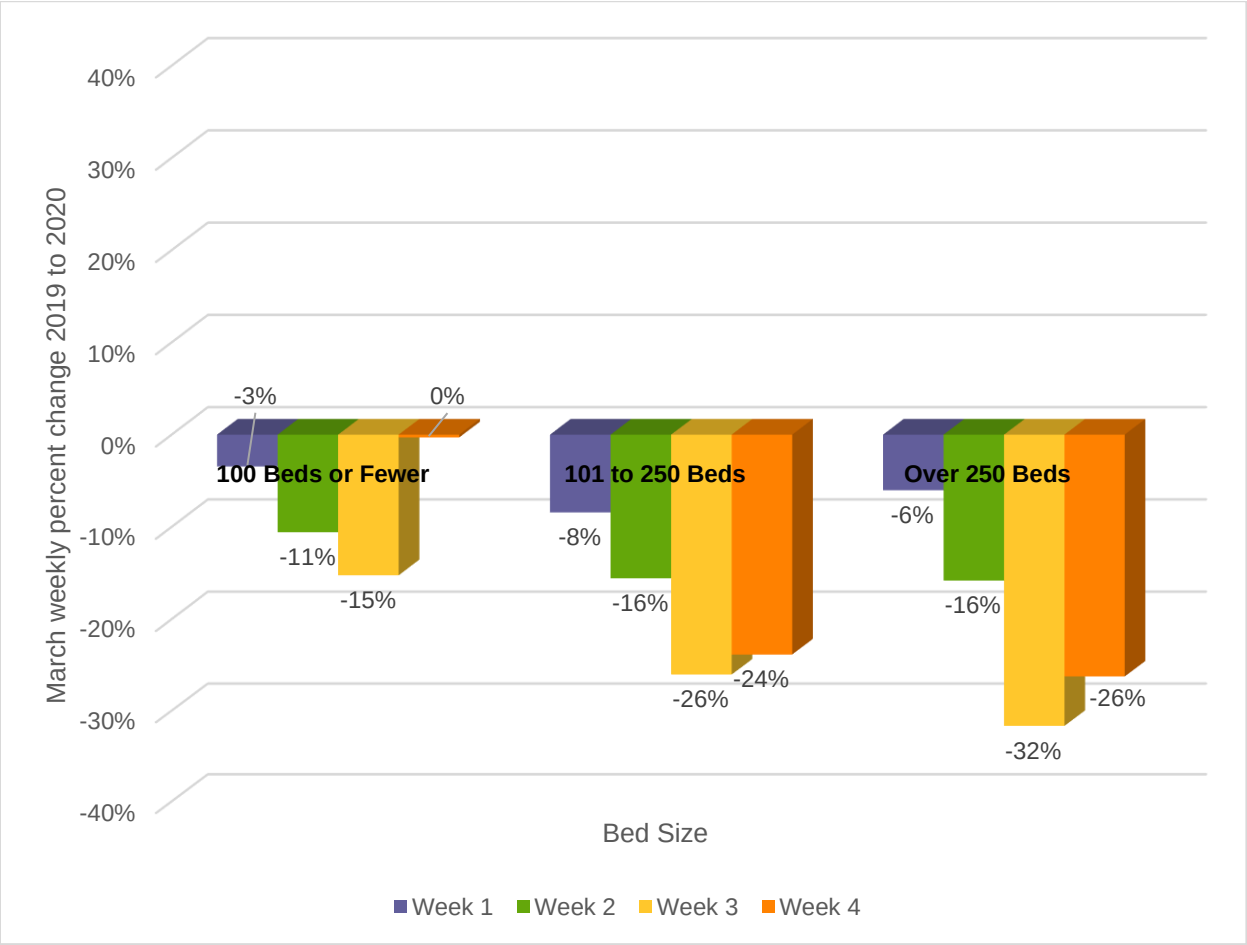

Figure 8. March weekly percent change in facility discharge volume 2019 to 2020, by bed size, nationally

In the Northeast, the decrease in facility discharge volume in week 3 of March 2020 as compared with 2019 (figure 9) was more pronounced than in the nation as a whole. From smallest to largest facilities in the Northeast, the decrease in week 3 ranged from 24 percent to 30 percent to 40 percent. In the case of midsize facilities, the decrease in week 4 was even greater than that of week 3 (34 percent). In small and large facilities, week 4 showed a smaller decrease than week 3, but only marginally so—23 percent for small facilities, 39 percent for large.

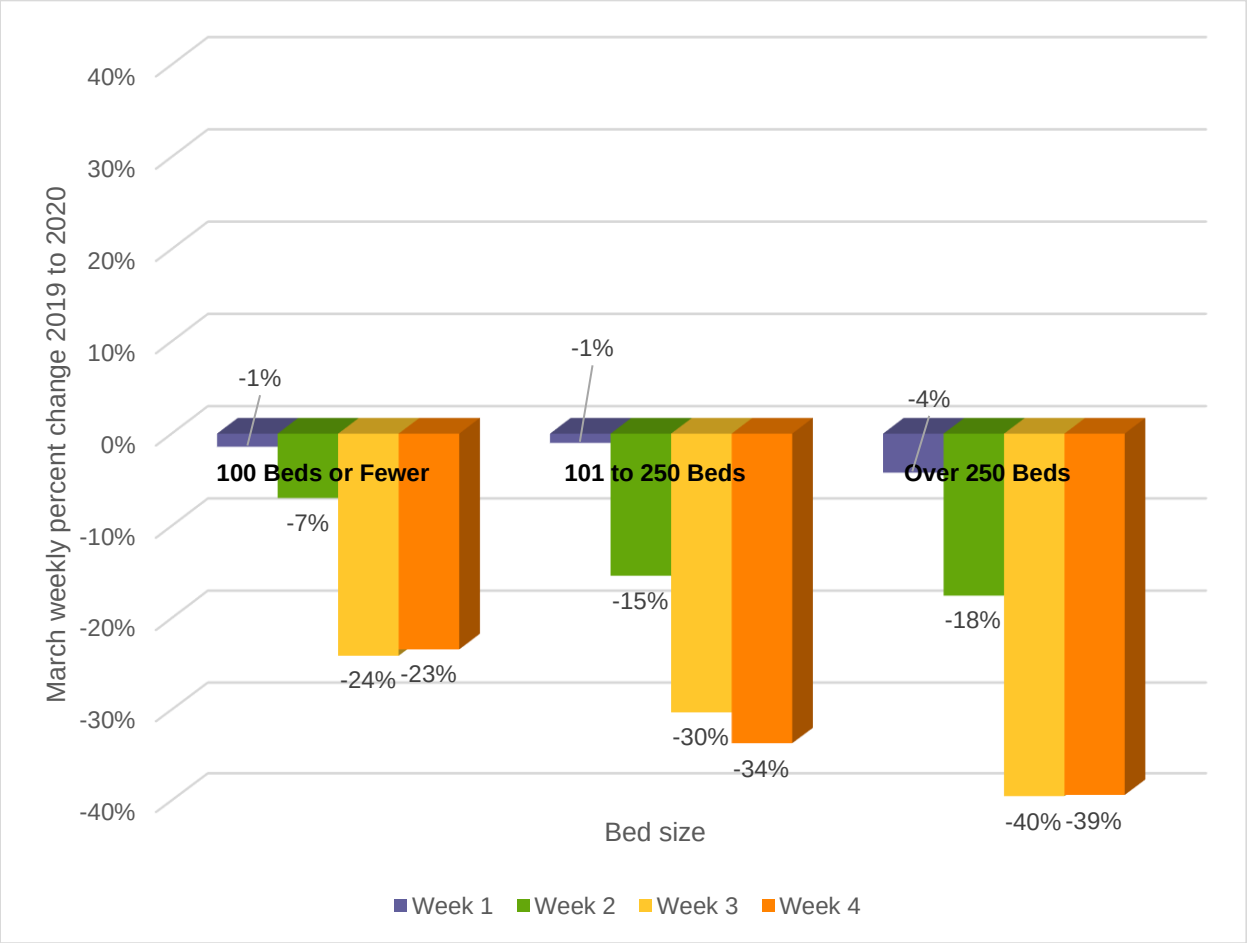

Figure 9. March weekly percent change in facility discharge volume 2019 to 2020, by bed size, Northeast

Distribution of Allowed Amounts by Settings

Within facilities, there was little difference in the distribution of estimated allowed amounts by settings (ER, inpatient and outpatient) nationally in first quarter 2019 and first quarter 2020. But there was a notable difference when March 2019 and March 2020 were compared (figure 10). In March 2019, the outpatient share accounted for 69 percent of the distribution, but one year later that share fell to 61 percent. The inpatient share rose from 21 percent to 28 percent, and the ER share increased from 10 percent to 11 percent. The reason for the decrease in outpatient share relative to inpatient share may be that the elective services that were deferred were disproportionately in the outpatient setting. In addition, some patients may have still been in the hospital as inpatients when subsequent elective inpatient procedures were deferred.

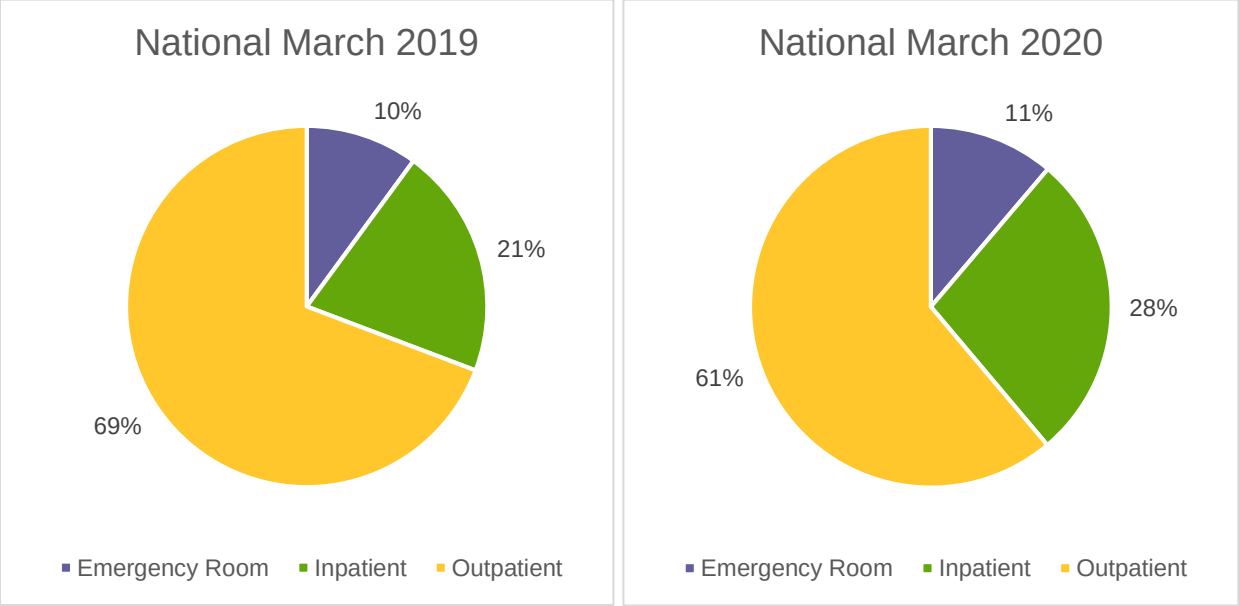

Figure 10. Distribution of estimated allowed amounts by settings (ER, inpatient and outpatient) within facilities nationally in March 2019 and March 2020

The difference between March 2019 and March 2020 with respect to distribution of estimated allowed amounts by settings was even sharper in the Northeast (figure 11) than nationally. In the Northeast, from March 2019 to March 2020, the outpatient share of the distribution declined from 70 percent to 58 percent, while the inpatient share increased from 22 percent to 33 percent and the ER share grew from 8 percent to 9 percent.

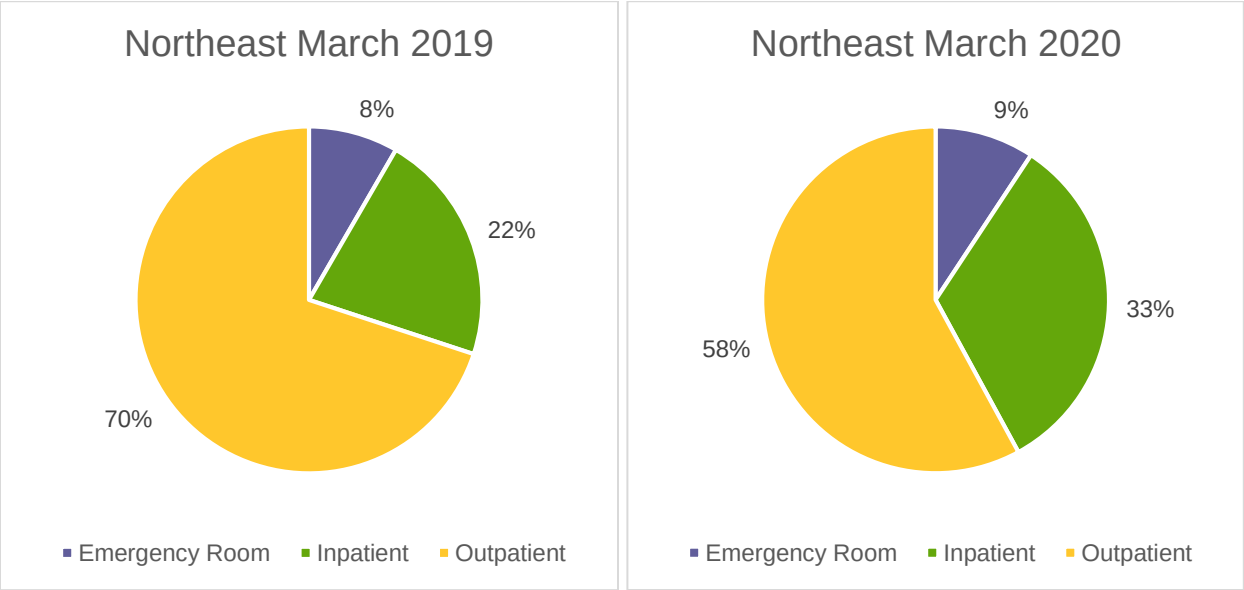

Figure 11. Distribution of estimated allowed amounts by settings (ER, inpatient and outpatient) within facilities in the Northeast in March 2019 and March 2020

Diagnostic and Procedure Categories

In all three settings (inpatient, outpatient, ER), FAIR Health evaluated the five most common diagnostic or procedure categories by volume and by estimated allowed amounts in the nation and the Northeast in weeks 3 and 4 (i.e., March 15-28) of March 2019 and March 2020. The results are presented in tables 2-13. In each table, the rankings show the five most common diagnostic or procedure categories for each two-week period in each year. Percentages are rounded.

Inpatient Diagnostic Categories

In the inpatient setting nationally, the fourth most common diagnostic category by inpatient volume in 2019, diseases and disorders of the digestive system, moved to ninth place in 2020 (table 2). Inpatient stays associated with major esophageal disorders, gastrointestinal disorders and digestive malignancies constituted seven percent of total inpatient volume in 2019 and four percent in 2020. Diseases and disorders of the respiratory system moved up from fifth place in 2019 (at 6 percent of inpatient volume) to fourth place in 2020 (at 10 percent). Since COVID-19 is a respiratory disease, it may have driven this change. However, because U07.1 (the diagnosis code for COVID-19) was not instituted until March 18, 2020, and many systems were not prepared to bill this code until sometime after that, hospitals and doctors were billing multiple combinations of codes to capture this information.

Table 2. Five most common diagnostic categories by inpatient volume in weeks 3 and 4 of March 2019 and March 2020 nationally

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of Inpatient Volume**	**Ranking**	**Percent of Inpatient Volume**
Pregnancy, Childbirth and Puerperium	1	33%	1	23%
Diseases and Disorders of the Musculoskeletal System and Connective Tissue	2	16%	2	20%
Diseases and Disorders of the Circulatory System	3	12%	3	13%
Diseases and Disorders of the Digestive System	4	7%	9	4%
Diseases and Disorders of the Respiratory System	5	6%	4	10%
Diseases and Disorders of the Endocrine, Nutritional and Metabolic System	7	5%	5	5%

In the inpatient setting in the Northeast, diseases and disorders of the respiratory system increased by an even greater degree than nationally, shifting from fifth place at 7 percent of inpatient volume in 2019 to third place at 14 percent in 2020 (table 3). Diseases and disorders of the musculoskeletal system and connective tissue maintained their first place rank and grew in share of inpatient volume (from 25 percent to 31 percent). This category seems to be dominated by DRG codes 560 (aftercare, musculoskeletal system and connective tissue with complication or comorbidity), and 470 (major hip and knee joint replacement or reattachment of lower extremity). These may indicate surgeries that were conducted prior to the cessation of these procedures by many hospitals.

Table 3. Five most common diagnostic categories by inpatient volume in weeks 3 and 4 of March 2019 and March 2020 in the Northeast

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of Inpatient Volume**	**Ranking**	**Percent of Inpatient Volume**
Diseases and Disorders of the Musculoskeletal System and Connective Tissue	1	25%	1	31%
Diseases and Disorders of the Circulatory System	2	19%	2	15%
Pregnancy, Childbirth and Puerperium	3	17%	4	9%
Diseases and Disorders of the Nervous System	4	8%	7	5%
Diseases and Disorders of the Respiratory System	5	7%	3	14%
Diseases and Disorders of the Endocrine, Nutritional and Metabolic System	8	5%	5	6%

In the inpatient setting nationally, diseases and disorders of the musculoskeletal system and connective tissue dropped from first place by estimated allowed dollars in 2019 to second place in 2020; this category's share of inpatient estimated allowed dollars fell from 23 percent to 20 percent (table 4). Diseases and disorders of the circulatory system and of the respiratory system both increased their share of inpatient estimated allowed dollars. Circulatory system diagnoses moved from third place (at 18 percent) to first place (at 24 percent). Respiratory system diagnoses stayed in fourth place, but with an increase in their share of dollars (from 8 percent to 13 percent).

Table 4. Five most common diagnostic categories by inpatient estimated allowed dollars in weeks 3 and 4 of March 2019 and March 2020 nationally

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of Inpatient Dollars**	**Ranking**	**Percent of Inpatient Dollars**
Diseases and Disorders of the Musculoskeletal System and Connective Tissue	1	23%	2	20%
Pregnancy, Childbirth and Puerperium	2	21%	3	16%
Diseases and Disorders of the Circulatory System	3	18%	1	24%
Diseases and Disorders of the Respiratory System	4	8%	4	13%
Diseases and Disorders of the Nervous System	5	7%	8	3%
Diseases and Disorders of the Digestive System	6	4%	5	4%

In the inpatient setting in the Northeast, diseases and disorders of the respiratory system increased to a greater than degree than nationally by estimated allowed dollars (table 5), just as they did by volume. Respiratory system was in fourth place with 9 percent of inpatient estimated allowed dollars in 2019, but in second place with 22 percent in 2020.

Table 5. Five most common diagnostic categories by inpatient estimated allowed dollars in weeks 3 and 4 of March 2019 and March 2020 in the Northeast

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of Inpatient Dollars**	**Ranking**	**Percent of Inpatient Dollars**
Diseases and Disorders of the Musculoskeletal System and Connective Tissue	1	29%	1	30%
Diseases and Disorders of the Circulatory System	2	24%	3	17%
Pregnancy, Childbirth and Puerperium	3	10%	4	6%
Diseases and Disorders of the Respiratory System	4	9%	2	22%
Diseases and Disorders of the Nervous System	5	6%	7	4%
Diseases and Disorders of the Hepatobiliary System and Pancreas	7	5%	5	6%

Outpatient Procedure Categories

In the outpatient setting nationally, mammography fell from second place with a 13 percent share of outpatient volume in 2019 to fourth place with a 9 percent share in 2020 (table 6). By contrast, an injections and infusions category (hydration, therapeutic, prophylactic, diagnostic injections and infusions, and chemotherapy and other highly complex drug or highly complex biologic agent administration) rose from fifth place with a seven percent share in 2019 to third place with a nine percent share in 2020.

Table 6. Five most common procedure categories by outpatient volume in weeks 3 and 4 of March 2019 and March 2020 nationally

	2019		2020	
Procedure Category	**Ranking**	**Percent of Outpatient Volume**	**Ranking**	**Percent of Outpatient Volume**
Diagnostic Radiology (Diagnostic Imaging) Procedures	1	25%	1	27%
Breast, Mammography	2	13%	4	9%
Diagnostic Ultrasound Procedures	3	10%	2	11%
Cardiovascular Procedures	4	7%	6	7%
Hydration, Therapeutic, Prophylactic, Diagnostic Injections and Infusions, and Chemotherapy and Other Highly Complex Drug or Highly Complex Biologic Agent Administration	5	7%	3	9%
Surgical Procedures on the Cardiovascular System	6	6%	5	7%

In the outpatient setting in the Northeast, mammography fell from second place by volume in 2019 to fourth place in 2020 (table 7), just as it did nationally; its share of outpatient volume dropped from 12 percent to 9 percent. The same category of injections and infusions that rose nationally increased in the Northeast from fourth place with 8 percent of outpatient volume in 2019 to third place with 11 percent in 2020. Cardiovascular procedures, which include cardiographies and evaluations of implantable, insertable and wearable cardiac devices, fell from fifth to sixth place, though it remained at seven percent of outpatient volume.

Table 7. Five most common procedure categories by outpatient volume in weeks 3 and 4 of March 2019 and March 2020 in the Northeast

	2019		2020	
Procedure Category	**Ranking**	**Percent of Outpatient Volume**	**Ranking**	**Percent of Outpatient Volume**
Diagnostic Radiology (Diagnostic Imaging) Procedures	1	25%	1	24%
Breast, Mammography	2	12%	4	9%
Diagnostic Ultrasound Procedures	3	11%	2	12%
Hydration, Therapeutic, Prophylactic, Diagnostic Injections and Infusions, and Chemotherapy and Other Highly Complex Drug or Highly Complex Biologic Agent Administration	4	8%	3	11%
Cardiovascular Procedures	5	7%	6	7%
Surgical Procedures on the Cardiovascular System	6	6%	5	8%

In the outpatient setting nationally, the rankings for the four most common procedure categories by estimated allowed dollars remained unchanged from 2019 to 2020, with only small shifts in percent of outpatient estimated allowed dollars (table 8). In the fifth place in the rankings there was a change. Surgical procedures on the musculoskeletal system fell from fifth place with six percent of outpatient estimated allowed dollars in 2019 to seventh place with four percent in 2020. Radiation oncology treatment rose from 15th place with two percent of outpatient estimated allowed dollars in 2019 to 5th place with five percent in 2020.

Table 8. Five most common procedure categories by outpatient estimated allowed dollars in weeks 3 and 4 of March 2019 and March 2020 nationally

	2019		2020	
Procedure Category	**Ranking**	**Percent of Outpatient Dollars**	**Ranking**	**Percent of Outpatient Dollars**
Diagnostic Radiology (Diagnostic Imaging) Procedures	1	32%	1	34%
Surgical Procedures on the Digestive System	2	10%	2	8%
Cardiovascular Procedures	3	8%	3	7%
Diagnostic Ultrasound Procedures	4	6%	4	7%
Surgical Procedures on the Musculoskeletal System	5	6%	7	4%
Radiation Oncology Treatment	15	2%	5	5%

In the Northeast compared to the nation as a whole, there was more movement among the top four procedure categories by outpatient estimated allowed dollars from 2019 to 2020, but without any new entrants to the top four (table 9). In the Northeast as in the nation, surgical procedures on the musculoskeletal system dropped from fifth place with six percent of outpatient estimated allowed dollars to seventh place with four percent. Moving into fifth place (with six percent of outpatient estimated allowed dollars) from seventh place (with four percent) was the category of hydration, therapeutic, prophylactic, diagnostic injections and infusions, and chemotherapy and other highly complex drug or highly complex biologic agent administration.

Table 9. Five most common procedure categories by outpatient estimated allowed dollars in weeks 3 and 4 of March 2019 and March 2020 in the Northeast

	2019		2020	
Procedure Category	**Ranking**	**Percent of Outpatient Dollars**	**Ranking**	**Percent of Outpatient Dollars**
Diagnostic Radiology (Diagnostic Imaging) Procedures	1	30%	1	30%
Surgical Procedures on the Digestive System	2	10%	3	8%
Cardiovascular Procedures	3	8%	4	7%
Diagnostic Ultrasound Procedures	4	7%	2	8%
Surgical Procedures on the Musculoskeletal System	5	6%	7	4%
Hydration, Therapeutic, Prophylactic, Diagnostic Injections and Infusions, and Chemotherapy and Other Highly Complex Drug or Highly Complex Biologic Agent Administration	7	4%	5	6%

Emergency Room Diagnostic Categories

In the ER setting nationally, the number one diagnostic category by volume remained unchanged from 2019 to 2020: acute respiratory diseases and infections (table 10). But this category's share of ER volume rose from 6 percent in 2019 to 14 percent in 2020. The category includes unspecified upper respiratory infections, cough, acute pharyngitis and acute bronchitis. Certain diagnostic categories did change position in the rankings. Abdominal and pelvic pain and tenderness (which includes all abdominal pain diagnoses) fell from third place with six percent of ER volume in 2019 to fourth place with five percent. By contrast, chest pain rose from fifth place to third place, both at five percent.

Table 10. Five most common diagnostic categories by ER volume in weeks 3 and 4 of March 2019 and March 2020 nationally

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of ER Volume**	**Ranking**	**Percent of ER Volume**
Acute Respiratory Diseases and Infections	1	6%	1	14%
Injury to Body	2	6%	2	6%
Abdominal and Pelvic Pain and Tenderness	3	6%	4	5%
General Signs and Symptoms	4	5%	5	5%
Head Injury	4	5%	7	4%
Chest Pain	5	5%	3	5%

In the ER setting in the Northeast, acute respiratory diseases and infections started at fifth place with a 5 percent share of ER volume in 2019, and moved to first place with a 14 percent share in 2020 (table 11). Abdominal and pelvic pain and tenderness was in first place with seven percent of ER volume in 2019 but fell to fourth place with five percent in 2020. Viral infections and diseases rose from 19th place at two percent of ER volume in 2019 to second place at six percent. The majority of those cases were B34.9, viral infection, unspecified—which likely included COVID-19 cases.

Table 11. Five most common diagnostic categories by ER volume in weeks 3 and 4 of March 2019 and March 2020 in the Northeast

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of ER Volume**	**Ranking**	**Percent of ER Volume**
Abdominal and Pelvic Pain and Tenderness	1	7%	4	5%
Injury to Body	2	6%	5	5%
General Signs and Symptoms	3	6%	3	6%
Head Injury	4	6%	6	5%
Acute Respiratory Diseases and Infections	5	5%	1	14%
Viral Infections and Diseases	19	2%	2	6%

In the ER setting nationally, acute respiratory diseases and infections rose from fourth place with 5 percent of ER estimated allowed dollars in 2019 to first place with 14 percent in 2020 (table 12). General signs and symptoms involving the circulatory and respiratory system (including shortness of breath, palpitations and epistaxis [extreme nose bleeds]) rose from 10th place with three percent of ER estimated allowed dollars in 2019 to fifth place with five percent in 2020. Certain other diagnostic categories fell in the ranking, such as injury to body, from fifth place to sixth place, both at five percent.

Table 12. Five most common diagnostic categories by ER estimated allowed dollars in weeks 3 and 4 of March 2019 and March 2020 nationally

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of ER Dollars**	**Ranking**	**Percent of ER Dollars**
Chest Pain	1	8%	2	8%
Abdominal and Pelvic Pain and Tenderness	2	7%	4	5%
General Signs and Symptoms	3	6%	3	6%
Acute Respiratory Diseases and Infections	4	5%	1	14%
Injury to Body	5	5%	6	5%
General Signs and Symptoms Involving Circulatory and Respiratory System	10	3%	5	5%

In the ER setting in the Northeast, the changing status of acute respiratory diseases and infections in the rankings by estimated allowed dollars (table 13) resembles that in the nation as a whole. In the Northeast, acute respiratory diseases and infections rose from seventh place with 5 percent of ER estimated allowed dollars in 2019 to first place with 13 percent in 2020. Viral infections and diseases also rose sharply, from number 21 with one percent of ER estimated allowed dollars in 2019 to number 3 with seven percent in 2020. Certain other diagnostic categories fell, particularly joint/soft tissue diseases and issues. This category, whose most common diagnosis is back pain, fell from fifth place with five percent in 2019 to 11th place with three percent in 2020.

Table 13. Five most common diagnostic categories by ER estimated allowed dollars in weeks 3 and 4 of March 2019 and March 2020 in the Northeast

	2019		2020	
Diagnostic Category	**Ranking**	**Percent of ER Dollars**	**Ranking**	**Percent of ER Dollars**
Abdominal and Pelvic Pain and Tenderness	1	7%	5	6%
Chest Pain	2	7%	2	7%
General Signs and Symptoms	3	7%	4	6%
Head Injury	4	6%	8	4%
Joint/Soft Tissue Diseases and Issues	5	5%	11	3%
Acute Respiratory Diseases and Infections	7	5%	1	13%
Viral Infections and Diseases	21	1%	3	7%

Conclusion

This study found evidence of decreases in average per-facility revenues based on estimated allowed amounts for hospitals and health systems in the first quarter of 2020 as compared to the first quarter of 2019. The decreases were most pronounced in March 2020, and particularly in the third week of March. The decline was sharper in the Northeast than in the nation as a whole. All this suggests that the decreases were a result of COVID-19 and the efforts to mitigate its transmission, both of which became widespread in March 2020, particularly in the third week of March and particularly in the Northeast. The fourth week of March had smaller decreases than the third. As noted, this may be because of a greater number of IBNR claims in week 4.

March 2020 also showed decreases in facility discharge volume that were even greater on a percentage basis than the decreases in estimated allowed amounts. As with estimated allowed amounts, the decreases in facility discharge volume were greater in the Northeast than nationally. In most cases, the decreases were greatest in the third week of March.

With respect to both estimated allowed amounts and facility discharge volume, in both the nation and the Northeast, there was generally an association between larger facility size and greater impact from COVID-19. Smaller facilities (100 beds or fewer) tended to have low to no impact, midsize facilities (101 to 250 beds) a moderate impact and large facilities (over 250 beds) a high impact.

From March 2019 to March 2020, the outpatient share of the distribution of estimated allowed amounts by settings (ER, inpatient and outpatient) decreased relative to the inpatient share. The effect was greater in the Northeast than nationally, though apparent in both. The ER share increased slightly in both the Northeast and the nation.

The third and fourth weeks of March 2020, compared to the corresponding period in 2019, saw several changes in the most common diagnostic categories in the inpatient and emergency room (ER) settings and in the most common procedure categories in the outpatient setting. Nationally and in the Northeast, in the inpatient setting, diseases and disorders of the respiratory system rose in share of distribution by volume and estimated allowed dollars, while in the ER setting, acute respiratory diseases and infections rose. Changes in procedure categories in the outpatient setting varied by whether volume or estimated allowed dollars were considered. Mammography, for example, fell in rank by volume in both the nation and the Northeast, while surgical procedures on the musculoskeletal system fell in rank by estimated allowed dollars.

This study helps to document the impact of COVID-19 on hospitals and health systems in the nation and, in particular, the Northeast in March 2020 from the perspective of estimated allowed amounts, facility discharge volume, distribution of settings and diagnostic and procedure categories. The results have been released in the hope that they will be useful to stakeholders across the healthcare sector, including hospitals and health systems, payors, policy makers and researchers. As the COVID-19 pandemic continues to test the entire healthcare system, FAIR Health seeks to provide data and analysis to support all the system's participants.

About FAIR Health

FAIR Health is a national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information through data products, consumer resources and health systems research support. FAIR Health qualifies as a public charity under section 501(c)(3) of the tax code. FAIR Health possesses the nation's largest collection of private healthcare claims data, which includes over 31 billion claim records contributed by payors and administrators who insure or process claims for private insurance plans covering more than 150 million individuals. FAIR Health licenses its privately billed data and data products—including benchmark modules, data visualizations, custom analytics and market indices—to commercial insurers and self-insurers, employers, providers, hospitals and healthcare systems, government agencies, researchers and others. Certified by the Centers for Medicare & Medicaid Services (CMS) as a national Qualified Entity, FAIR Health also receives data representing the experience of all individuals enrolled in traditional Medicare Parts A, B and D; FAIR Health houses data on Medicare Advantage enrollees in its private claims data repository. FAIR Health can produce insightful analytic reports and data products based on combined Medicare and commercial claims data for government, providers, payors and other authorized users. FAIR Health's free, award-winning, national consumer websites are fairhealthconsumer.org and fairhealthconsumidor.org. For more information on FAIR Health, visit fairhealth.org.

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