

Understanding the Impact of the Second Wave of COVID-19 on Hospitals and Health Systems

January 25, 2021

New Year, New Analytics. Welcome to our new 2021 National Patient and Procedure Volume Tracker. We have made several changes to this report and we hope you find this new report even more useful than the 2020 version. **We will update this report monthly on the second Monday of each month.**

| 1. More Data |
|---|
| <ul style="list-style-type: none"> We have added over 30 hospitals to the 2021 report <i>Please see the first page of the report for breakdown by US Census Region</i> |
| <ul style="list-style-type: none"> We are now tracking shifts in payor mix beyond Self Pay In 2020, we developed a machine learning algorithm that summarizes the encounter's primary insurance plan into a high-level payor type – allowing us to report on changes beyond just Self Pay <i>Please see Section 10 for this new information</i> |
| 2. New Analytics |
| <ul style="list-style-type: none"> We have added ED and Observation to Inpatient Conversion rates which gauge how hospitals are utilizing these departments |
| <ul style="list-style-type: none"> We have one of the largest databases for COVID-19 Inpatients We are now reporting on COVID-19 hospitalizations <i>Please refer to Section 9</i> |
| <ul style="list-style-type: none"> Service line data is now split between Inpatient and Outpatient data A green line will represent Outpatient volumes, a blue line will represent Inpatient volumes and historical data will be in grey |
| <ul style="list-style-type: none"> We have added Children's Hospitals to the data set Initially in 2020 COVID-19 was portrayed as affecting adults but not children, so we excluded Children's Hospitals from the report Over time, we learned that Children's Hospitals also saw shifts in patient demand as parents and caretakers kept children home with less opportunity for them to interact with others Incorporating Children's Hospitals allows for a new section that shows how demand has shifted for this specific group <i>Please refer to Section 6.1</i> |
| 3. Methodology Adjustments |
| <p>Using Six Month Rolling Average on Volumes</p> <ul style="list-style-type: none"> In the original report we compared 2020 volumes to 2019 to help organizations understand how patient demand changed For 2021, we don't believe it makes sense to compare to highly variable 2020 or to compare to pre COVID-19 2019 volumes Volumes seemed to stabilize at a new normal from July 2020 through December 2020 Inpatient volumes are down 5-7% versus 2019, while Emergency Department visits are consistently 20% below 2019 With the 2021 report, we are moving to using a six month rolling average (we average the weekly volumes) to compare recent shifts in volume changes |
| <p>Using UB Revenue Code for Patient Volume Counts</p> <ul style="list-style-type: none"> In 2021, we are using the UB Revenue Code in the encounter's charge line item detail to identify the encounter as an Inpatient (IP), Emergency (ED), Observation (Obs) or Outpatient (OP) encounter <ul style="list-style-type: none"> In 2020 we were using the patient type to track this information This new method allows for more uniform tracking of encounters across hospitals and better tracking of how many emergency room and observation patients convert to inpatients – something we were not able to track in 2020 This methodology change also allows for better reporting of patient encounter types at the service line level This is useful for monitoring procedures and service lines that have recently had Medicare reimbursement changes for site of care such as Total Hip and Total Knee Replacements |

Thanks for reading. Please share your feedback with our team at Jittner@stratadecision.com or Slefar@stratadecision.com.

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Outpatient continues to grow including knees. COVID-19 driving inpatient volume but crowding and better care drive lower length of stay.

1. Volume Data:

- a. Data represents volumes through 1/9/21. Thirty-day changes include the holiday season therefore we expect a decrease in volume.
- b. More telling is the first week back from the holidays: the week of 1/3/21 shows Inpatient (IP) and Outpatient (OP) growth (Section 1.2). The Northeast region had huge OP growth for the week of 1/3/21 (Section 5.2).
- c. **Outpatient is continuing to show strength.**

2. Section 6: New Pediatric Section!

- a. We note the large difference in ED to IP percent conversion and Obs Admitted to IP conversion compared to the national numbers. The lower conversion rates reflect the case mix that likely shows up in a pediatric ED.
- b. This is the first time we are looking at Children's Hospital numbers. Notice the strong growth in September – what in a normal year is “Back to School” time.

3. Section 7: Service Line Data

- a. Data represents Service Lines through 12/26/20. The holiday season makes it difficult to gauge trends other than the **clear growth in infectious disease tied to COVID-19.**
- b. Outpatient volumes dwarf inpatient given the sheer number of visits vs. admissions but growth and trends are very important signals.

4. Section 8: From Inpatient to Outpatient

- a. One area we are watching carefully is the shift from IP to OP as the site of care rules come to life.
- b. Notice especially OP Total Joint procedures. Aside from the holidays, **OP Total Joint procedures do seem to be increasing and offsetting the decrease seen on the IP side.**
- c. Mechanical Ventilation is up in the last 30 days due to ballooning COVID-19 volumes. However, it has been trending down and the percentage of COVID-19 inpatients getting ventilation is still dramatically down, as we saw in our Six Month Summary report published last summer.

5. Section 9: COVID-19

- a. All regions are seeing IP COVID-19 cases increase however, recently length of stay (LOS) is going down. We believe the decline in LOS has to do with both better understanding of when it is safe to send people home as well as the need to free up capacity for both COVID-19 and non COVID-19 patients.
- b. Another notable trend: Inpatient rates for those under 65 are dropping while rates continue to increase for older patients. This confirms that age is itself a tremendous risk factor for serious COVID-19 and supports vaccination focus in older populations first.

6. Section 10 – Payor Mix

- a. Now that we are reporting all payors, it is worth commenting on a few regional differences.
 1. The South clearly has lower private insurance and higher levels of Medicaid.
 2. The Northeast Region shows increasing Private Health Insurance verses decreasing Medicare. In November, encounters for both age groups (over and under 65 years old) decreased but the decrease was more significant for the over 65 age group. We calculate payor mix based on encounter volume, therefore the shift reflects younger patients coming for more encounters versus older patients. This tends to make sense, as screening and outpatient visits are still in “catch up mode” and younger patients may be more comfortable coming back.



National Patient and Procedure Volume Tracker™

Monthly Update 1/25/2021

Happy New Year! A new year, a new report! Please refer to the cover letter that highlights report changes and a full review of findings. Some highlights include:

Volume data is through 1/9/21. 30-day changes include the holiday season, therefore a decrease in volume is expected. More telling is the first week back from the holidays – week of 1/3/21 which shows inpatient and outpatient growth (Section 1.2).

Service line data is through 12/26/20. The holiday season makes it difficult to gauge trends other than the clear growth in Infectious Disease tied to COVID-19.

Please refer to Section 9 for our new COVID-19 section. We have also added a new section for Children's Hospitals (Section 6.1).

The data science team at Strata aggregated data from a cohort of 329 hospitals in 68 health systems. The breakdown of hospitals by U.S. Census Region is below.

Census Region Count

| Midwest | Northeast | South | West | Grand Total |
|---------|-----------|-------|------|-------------|
| 130 | 36 | 119 | 44 | 329 |

Section 1.1

National Level Recent Volume Changes

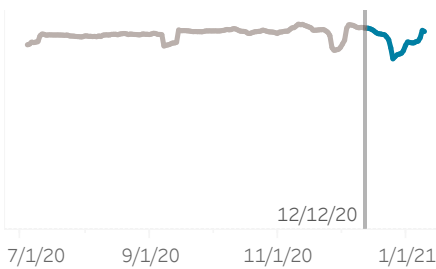
Data as of 1/9/2021

Historical Data
New Data

Inpatient Admissions

Past 30 Day Change

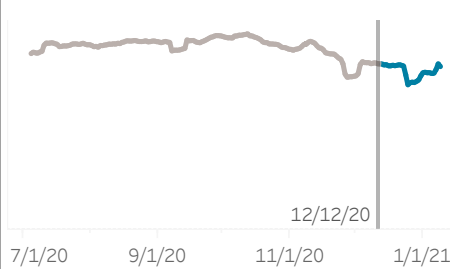
▼ -4.9%



Observation Visits

Past 30 Day Change

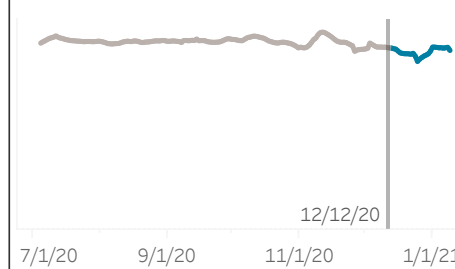
▼ -6.2%



Emergency Visits

Past 30 Day Change

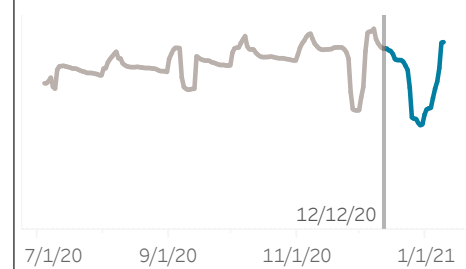
▼ -4.1%



Outpatient Visits

Past 30 Day Change

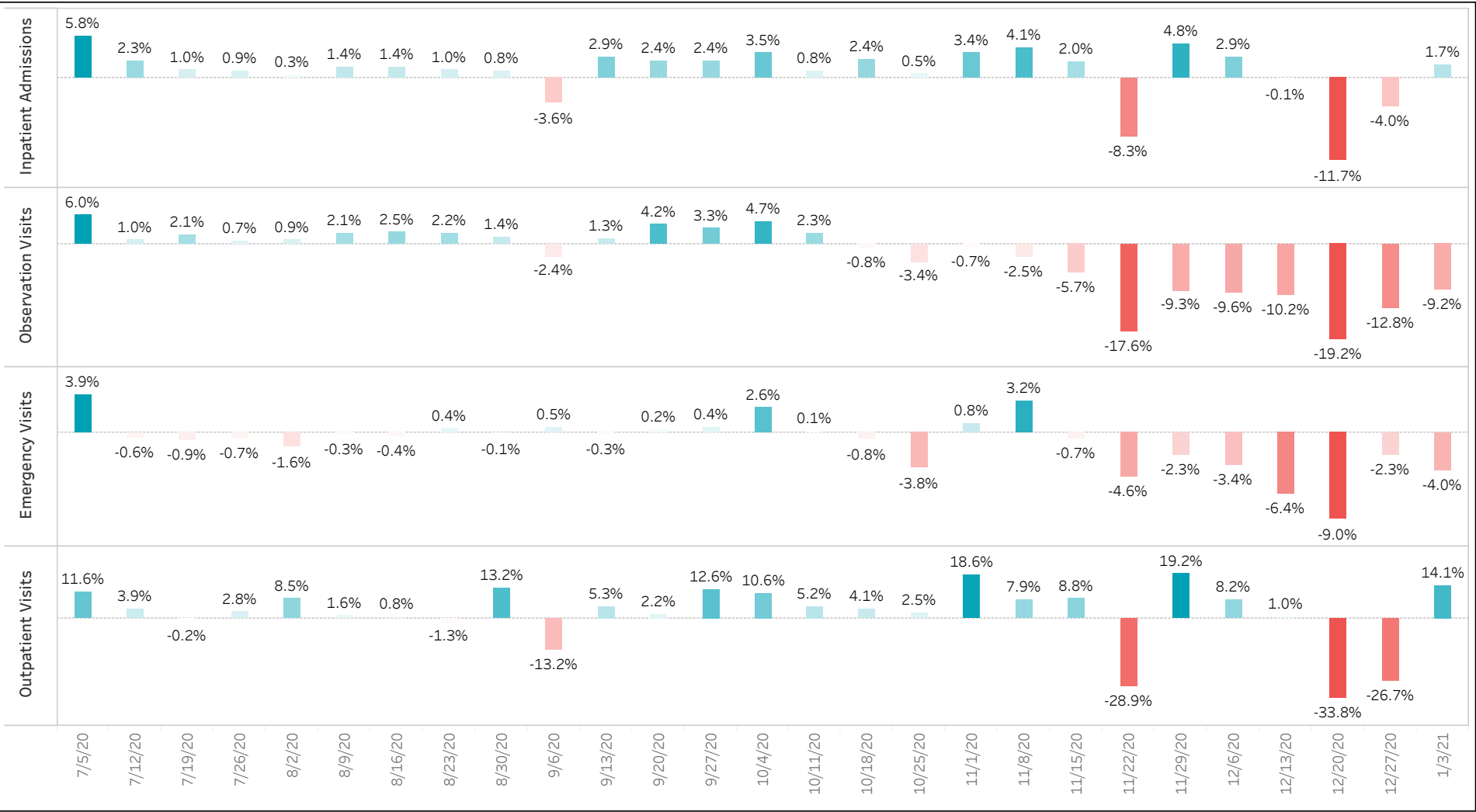
▼ -16.2%



Section 1.2

National Level Weekly Volume Changes Compared to Previous 26 Weeks Rolling Average

Data as of 1/9/2021



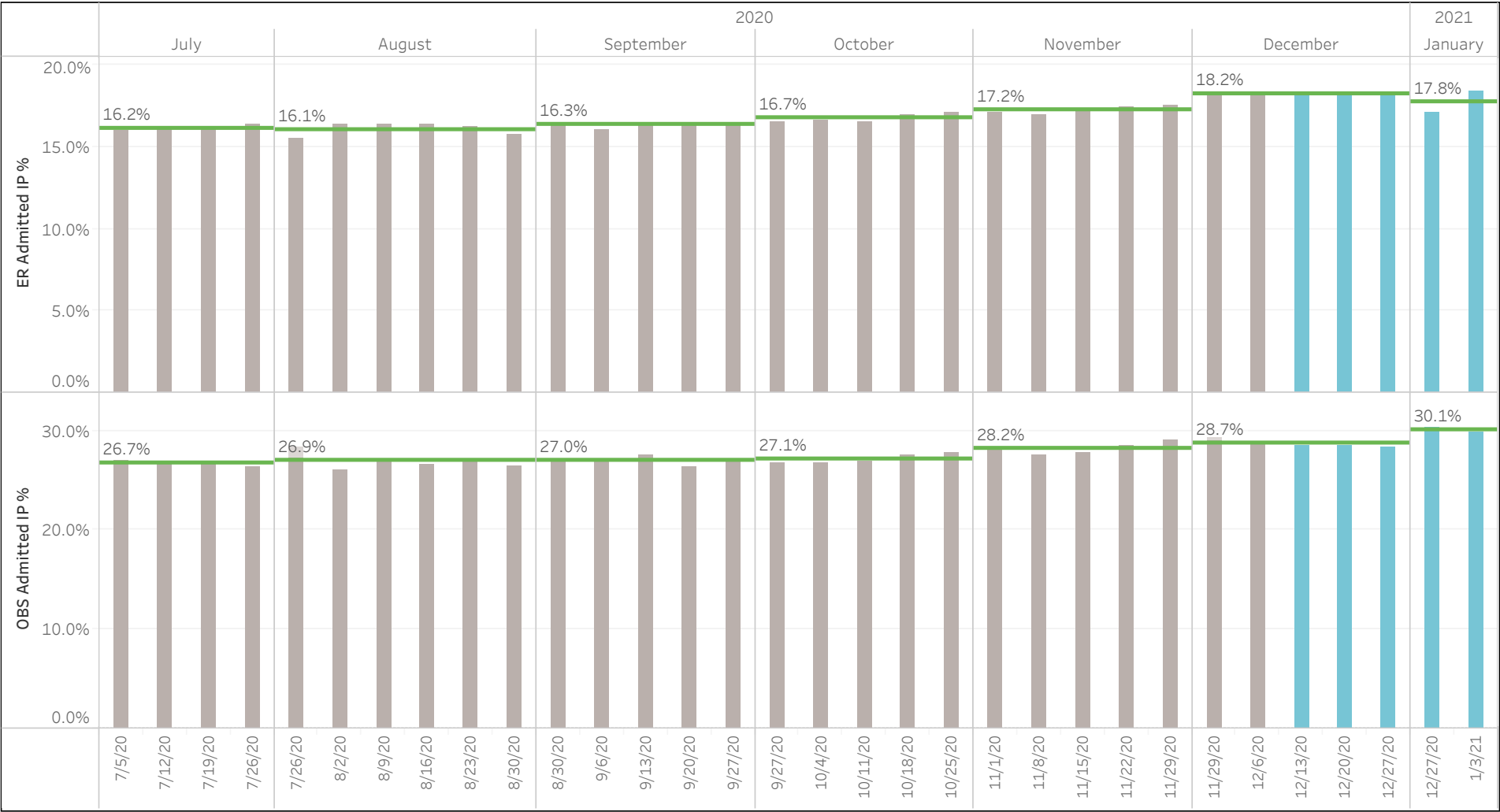
Section 1.3

National Level Inpatient Conversion Rate

Data as of 1/9/2021

Historical Data

New Data



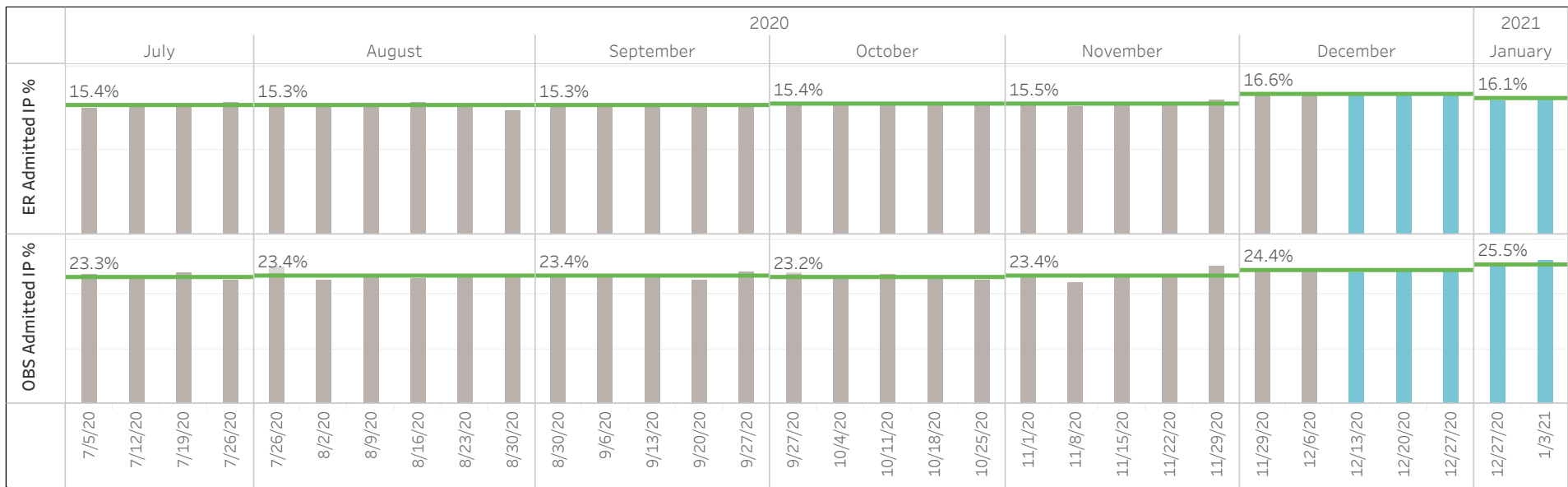
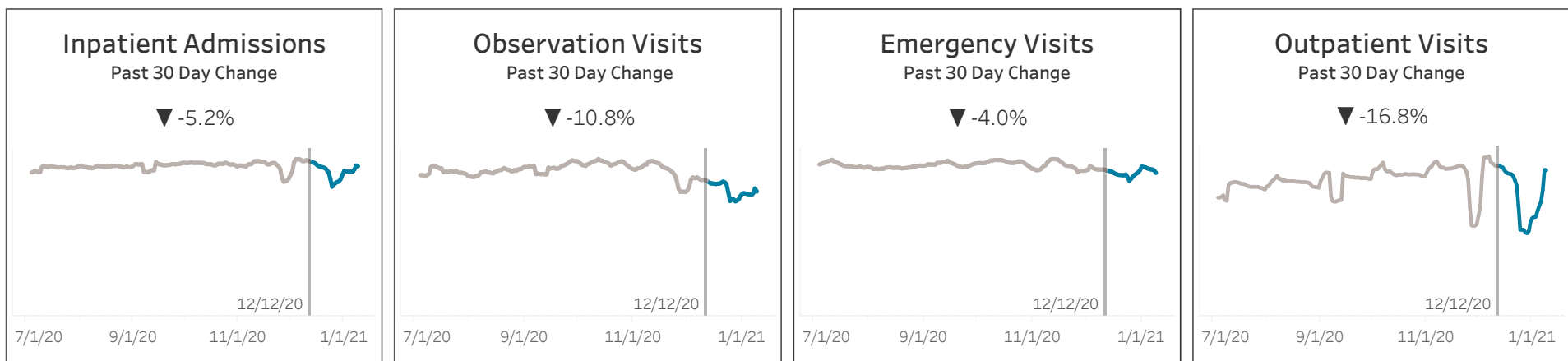
Section 2.1

Census Region-South Recent Volume Changes

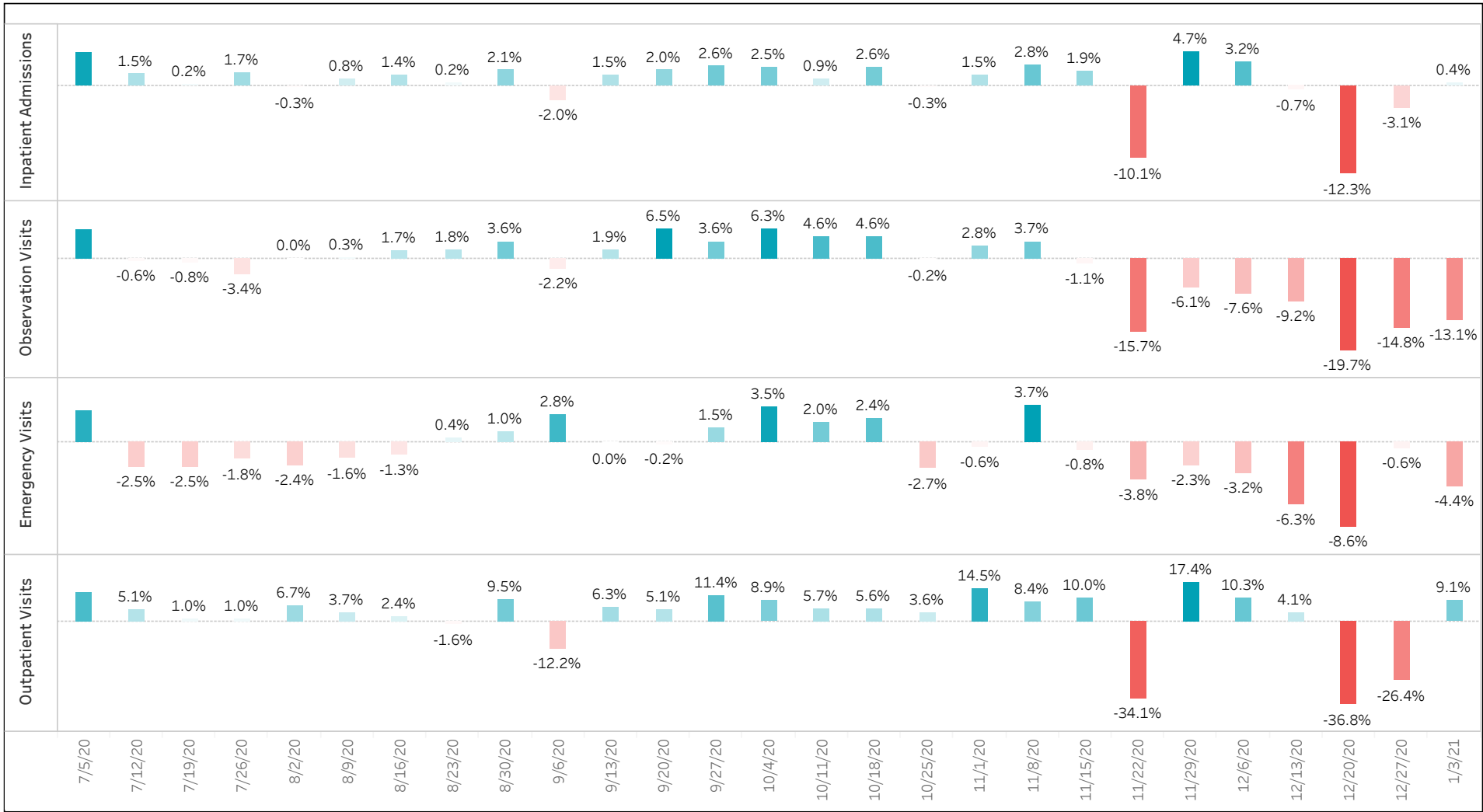
Data as of 1/9/2021

Historical Data

New Data



Section 2.2
Census Region - South Weekly Volume Changes
Compared to Previous 26 Weeks Rolling Average
Data as of 1/9/2021



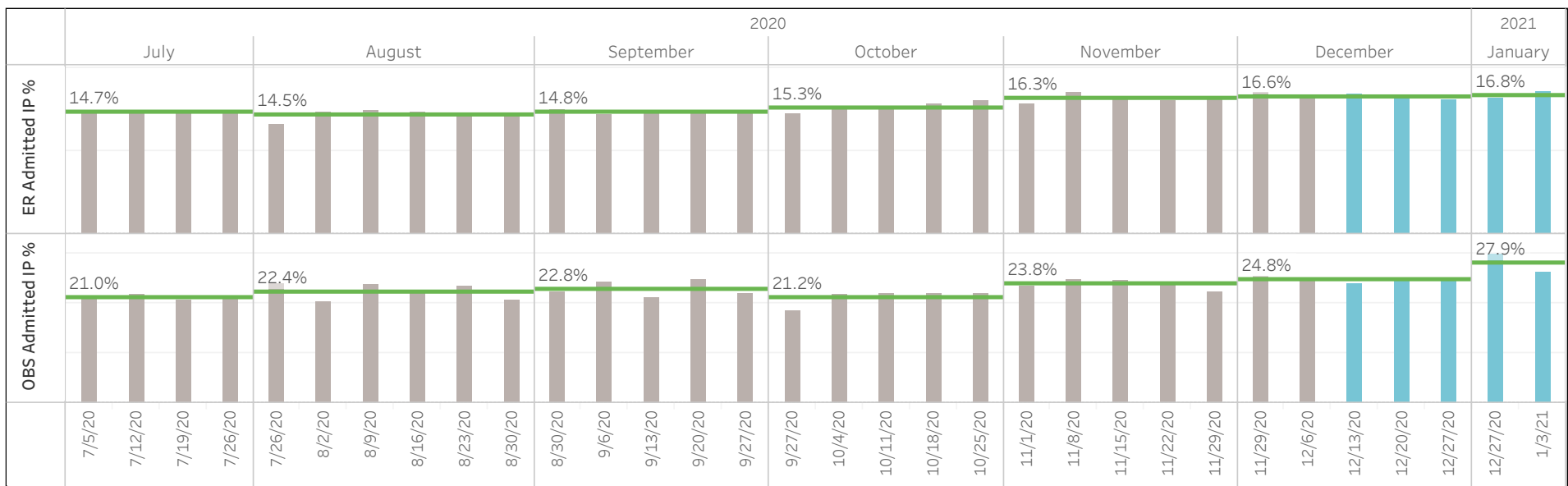
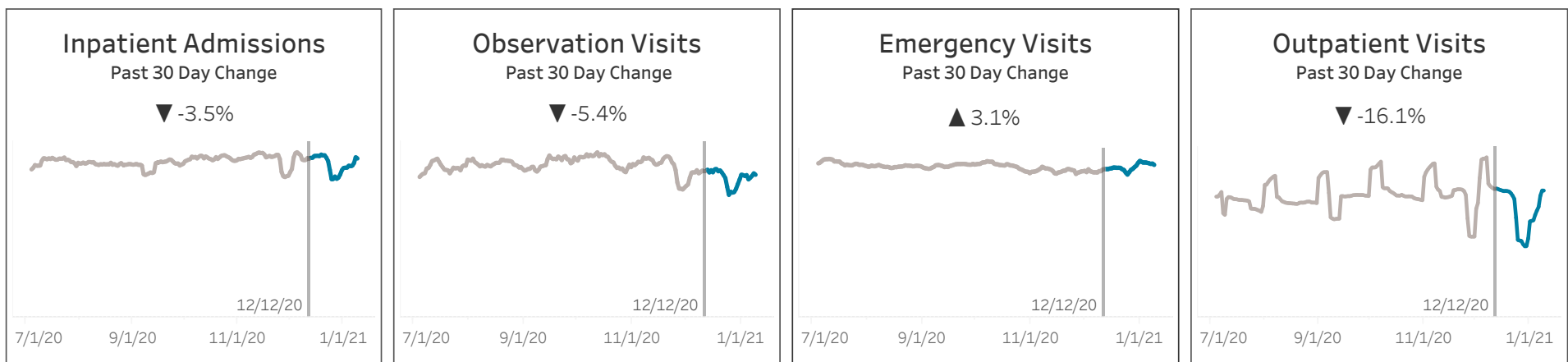
Section 3.1

Census Region-West Recent Volume Changes

Data as of 1/9/2021

Historical Data

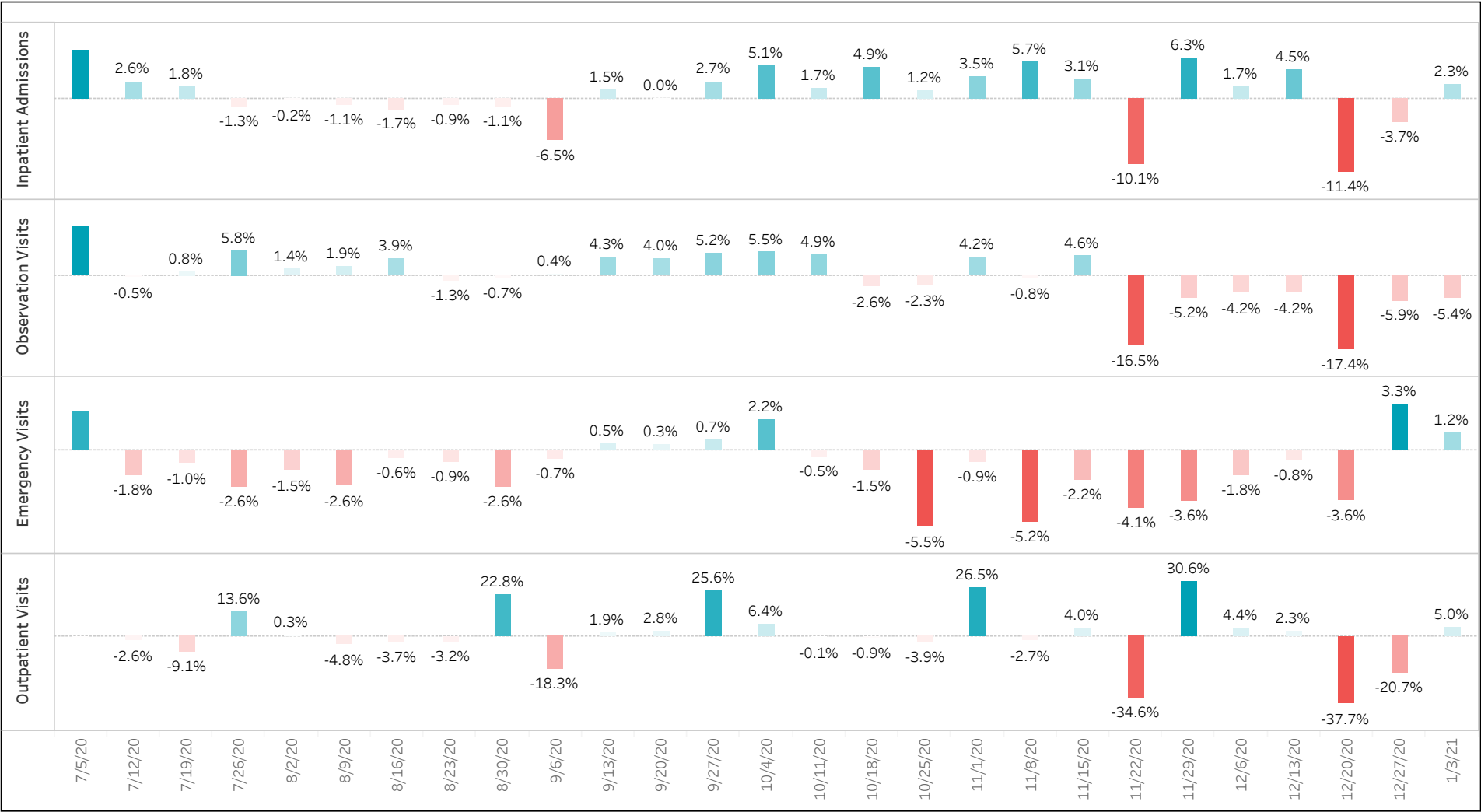
New Data



Section 3.2

Census Region - West Weekly Volume Changes
Compared to Previous 26 Weeks Rolling Average

Data as of 1/9/2021



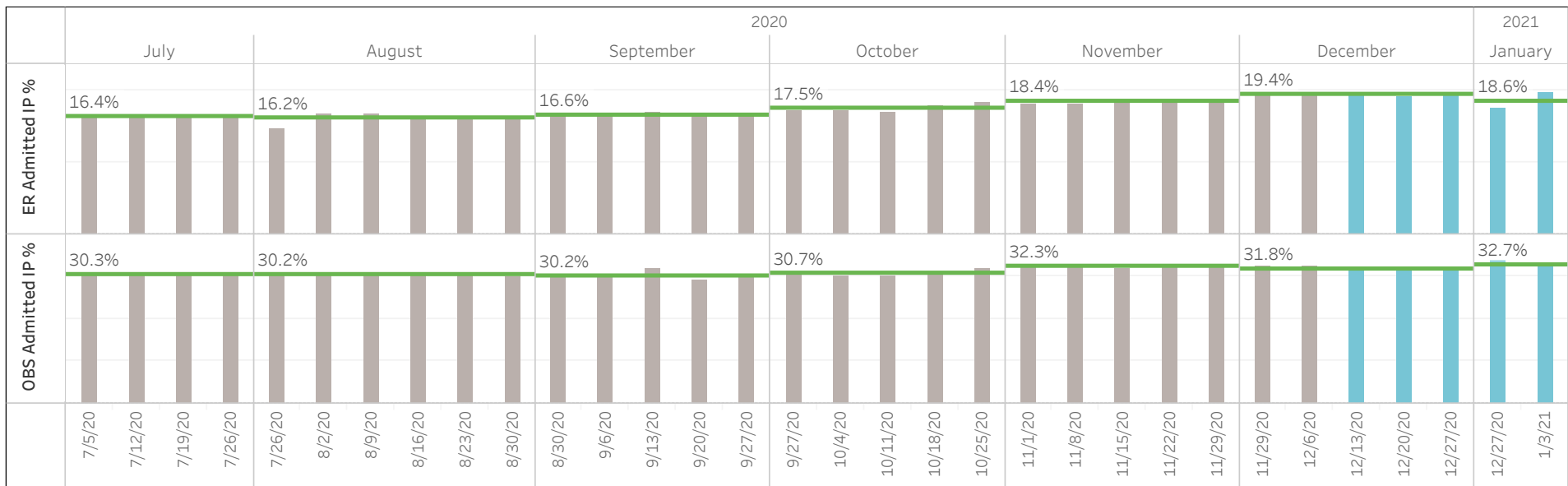
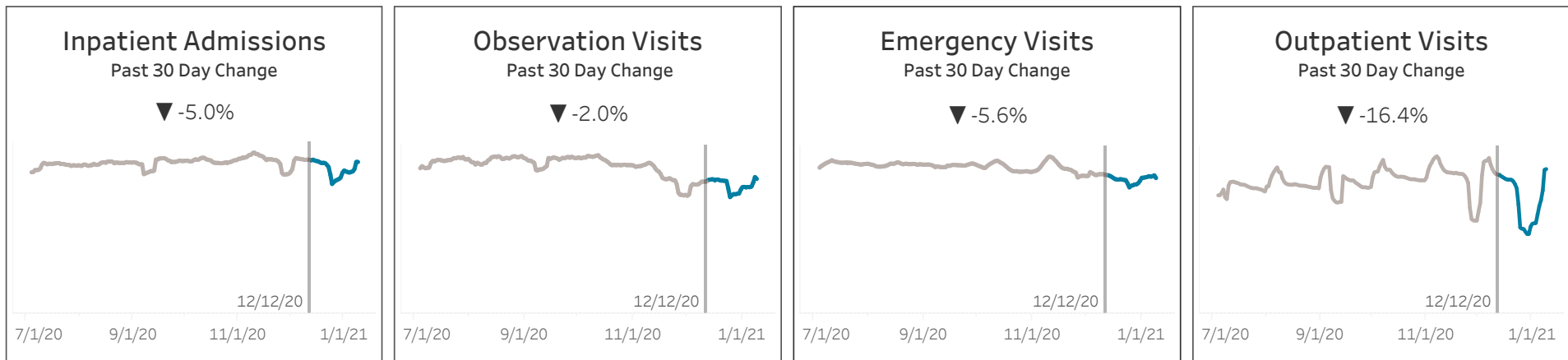
Section 4.1

Census Region-Midwest Recent Volume Changes

Data as of 1/9/2021

Historical Data

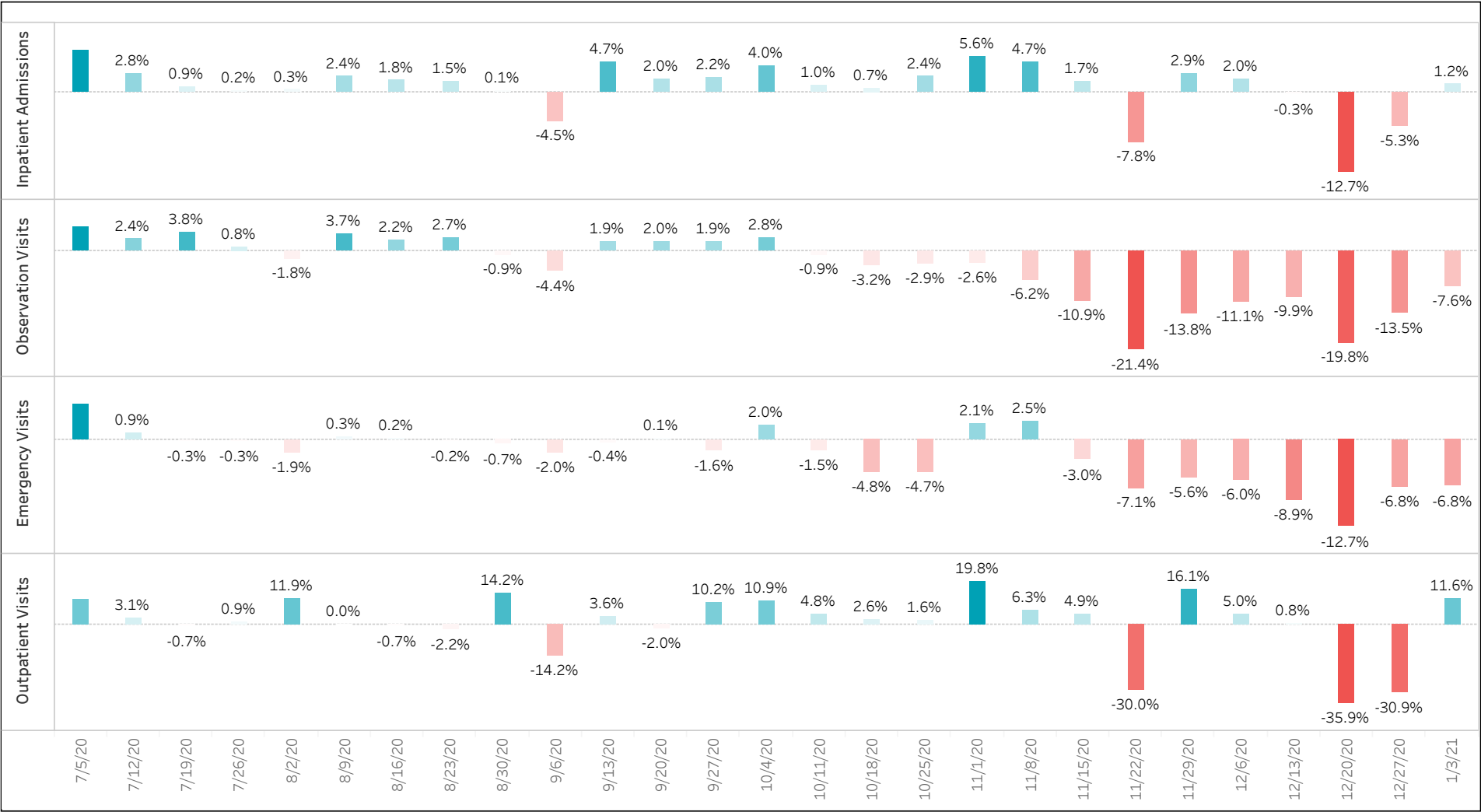
New Data



Section 4.2

Census Region - Midwest Weekly Volume Changes
Compared to Previous 26 Weeks Rolling Average

Data as of 1/9/2021



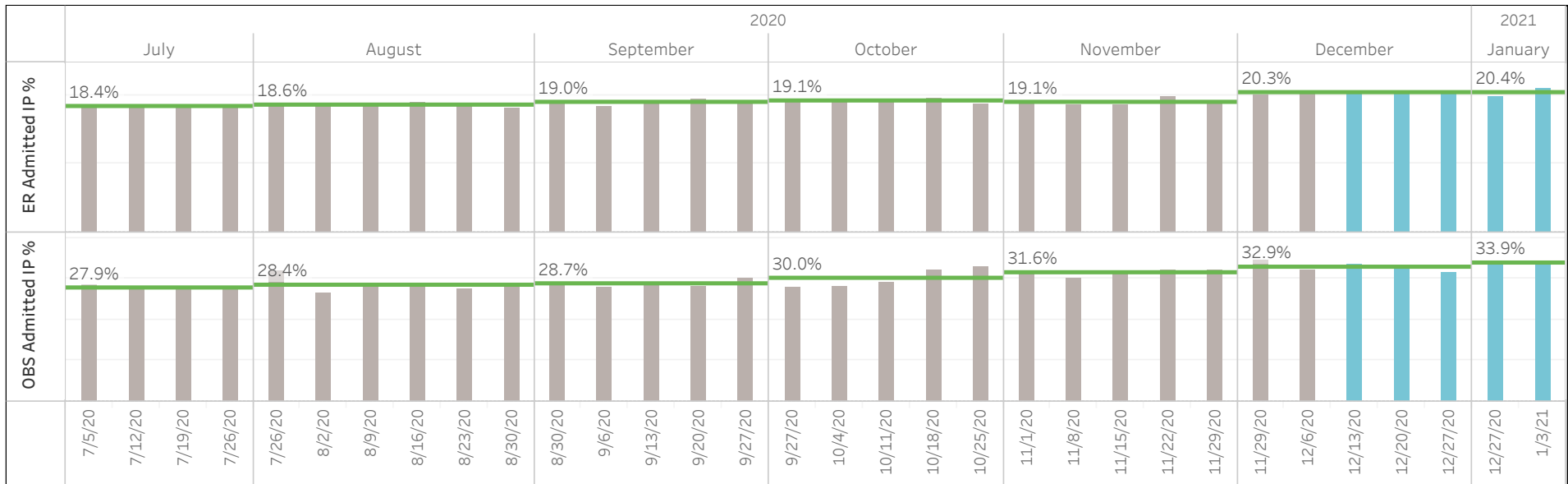
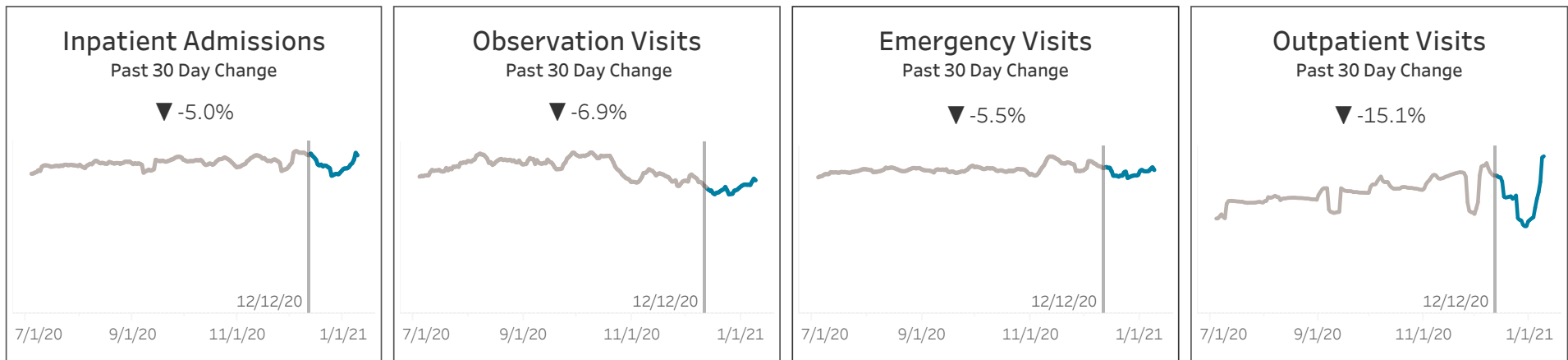
Section 5.1

Census Region-Northeast Recent Volume Changes

Data as of 1/9/2021

Historical Data

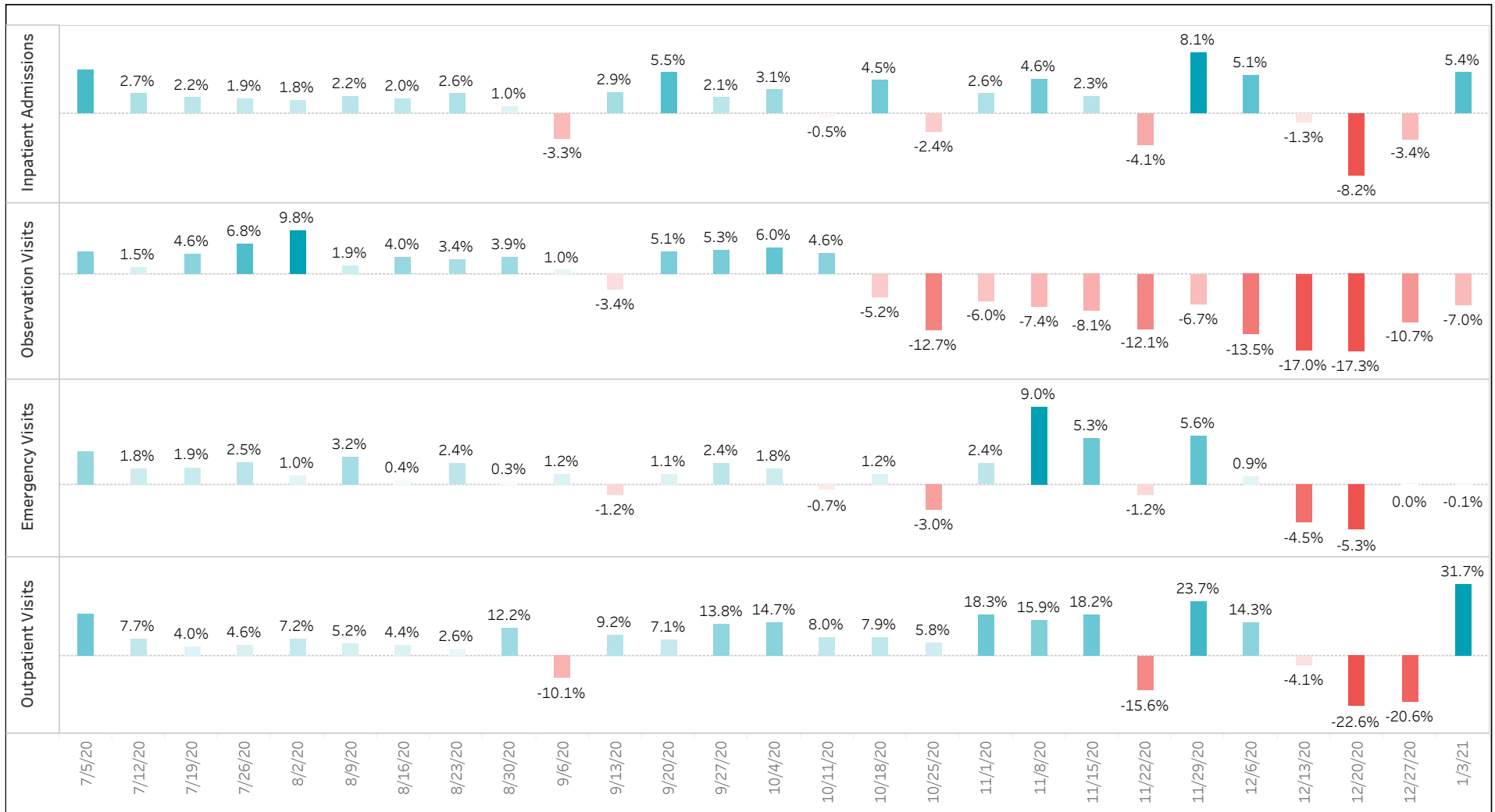
New Data



Section 5.2

Census Region - Northeast Weekly Volume Changes Compared to Previous 26 Weeks Rolling Average

Data as of 1/9/2021



Historical Data

12

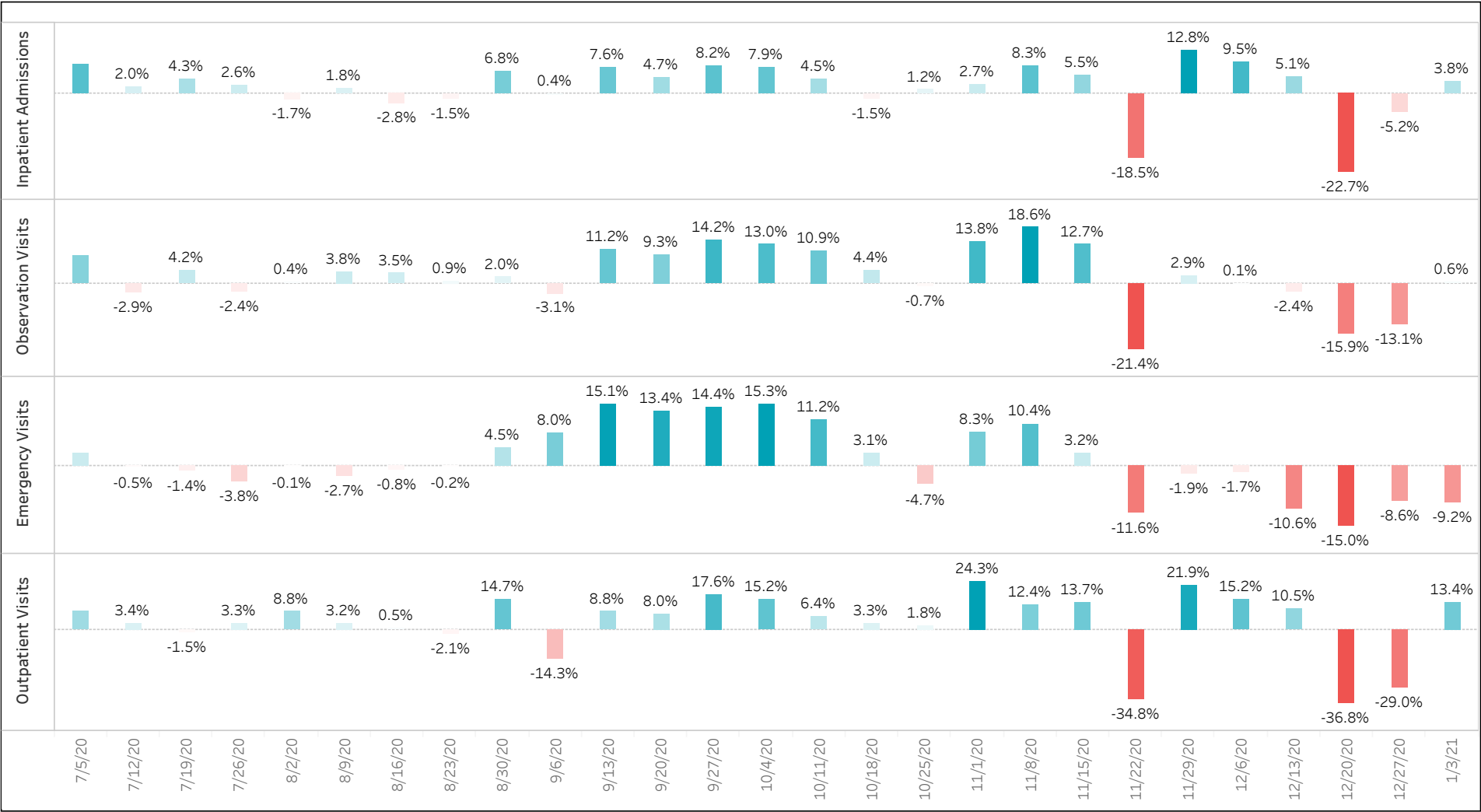
New Data



Section 6.2

Children’s Hospital Weekly Changes Compared to Previous 26 Weeks Rolling Average

Data as of 1/9/2021



1

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18

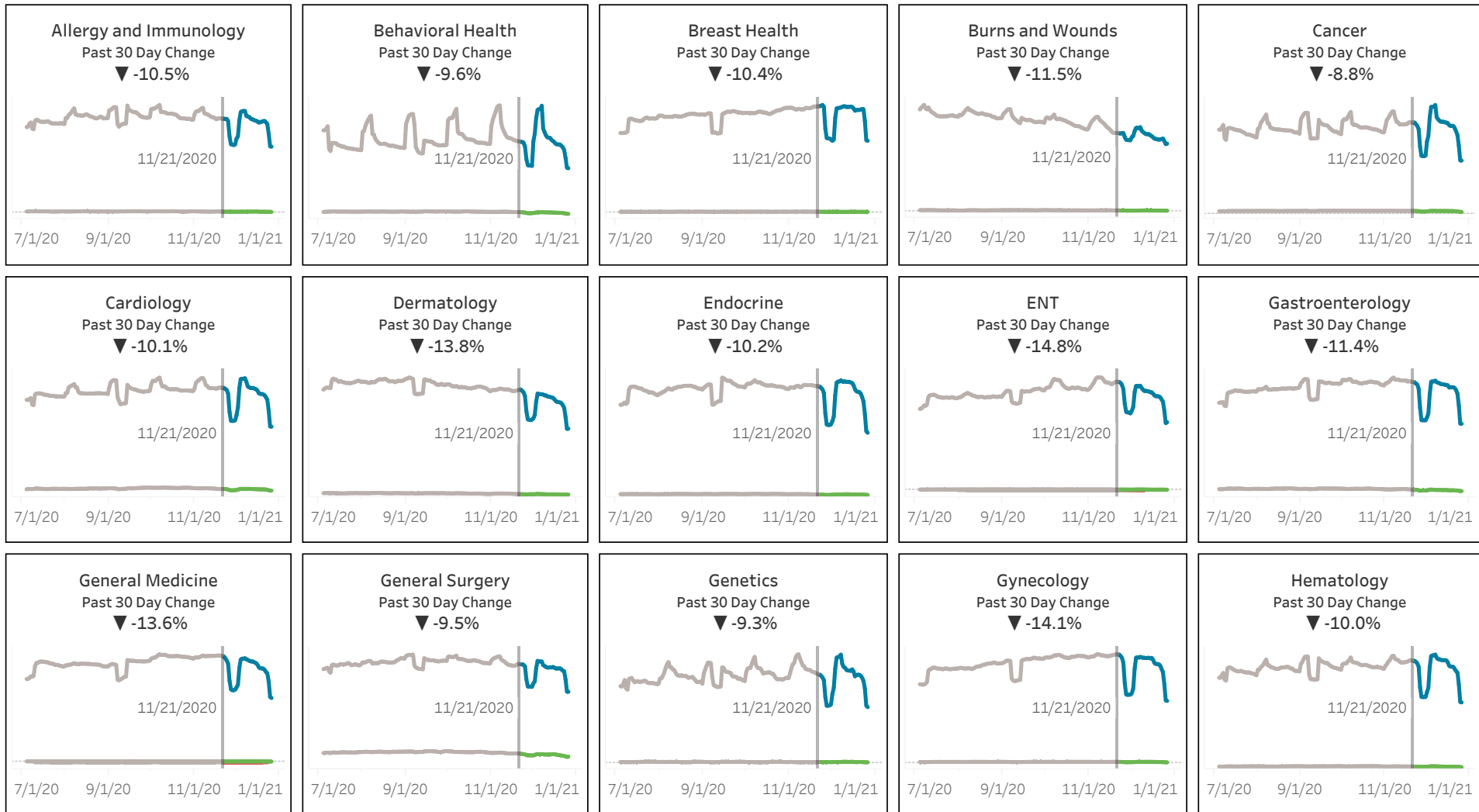
19

Section 7.1

National Volume Changes by Service Line

Data as of 12/26/2020

Historical Data Outpatient
Inpatient



1

2

3

4

5

6

7

8

9

10

11

12

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19

Section 7.2

National Volume Changes by Service Line

Data as of 12/26/2020

Historical Data

Newborn

Inpatient

Outpatient



1

2

3

4

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19

Section 8

National Volume Changes by Procedure Type

Data as of 12/26/2020

Historical Data

Outpatient

Inpatient



Section 9

COVID-19 Summary

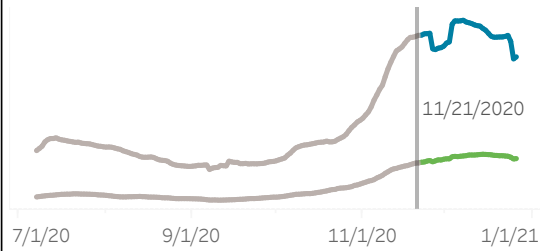
Data as of 12/26/2020

COVID-19 Infection

Past 30 Day Change

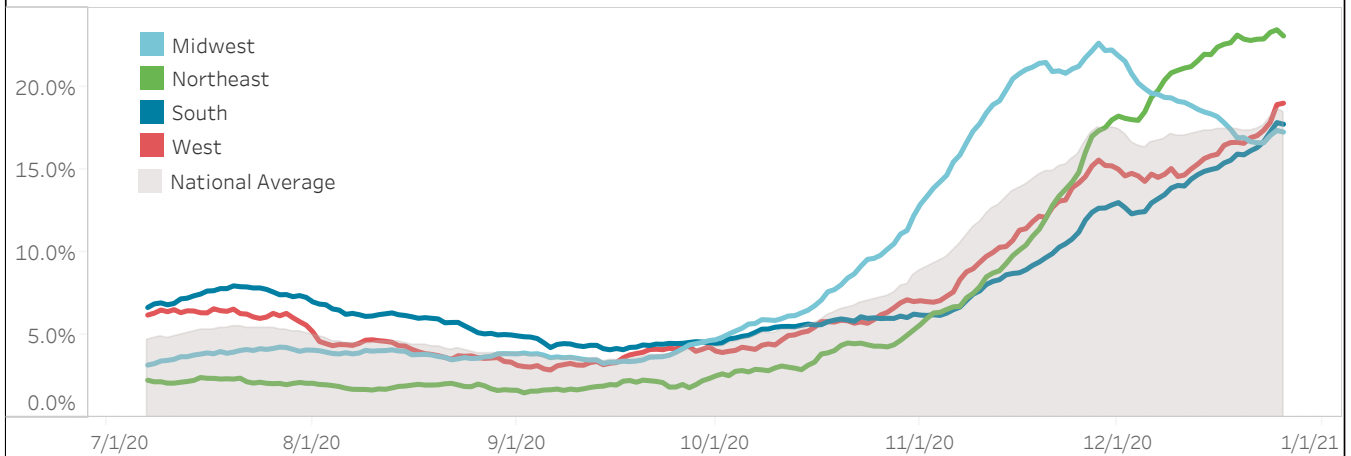
▲ 21.8%

Historical Data Inpatient Outpatient



COVID-19 Hospitalizations as Proportion of All Hospitalizations by Census Region

Midwest
Northeast
South
West
National Average



GMLOS for COVID-19 Inpatients

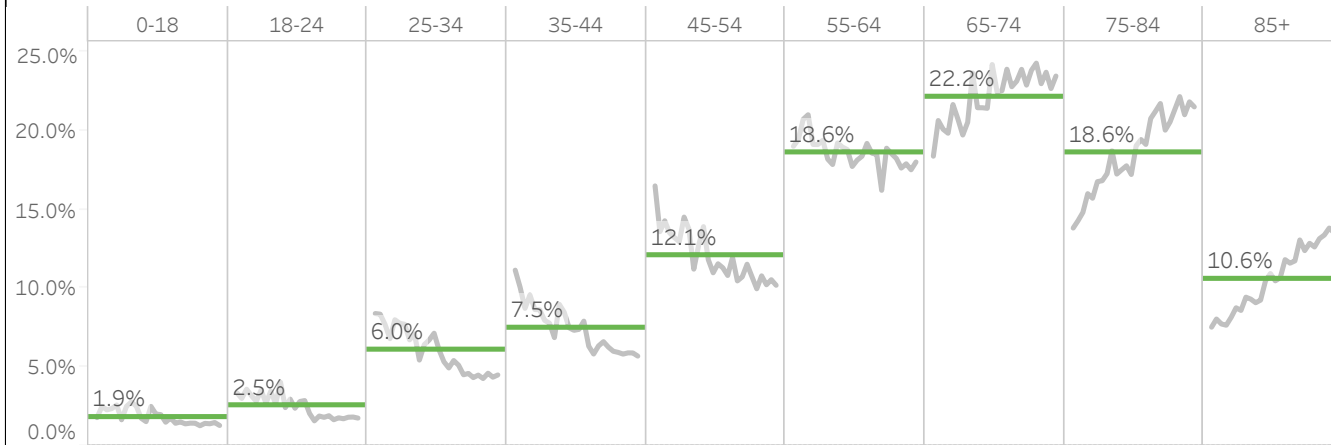
6.0
4.0
2.0
0.0

Historical Data
New Data

7/1/20 9/1/20 11/1/20 1/1/21

5.4

COVID-19 Inpatients by Age Group



Section 10

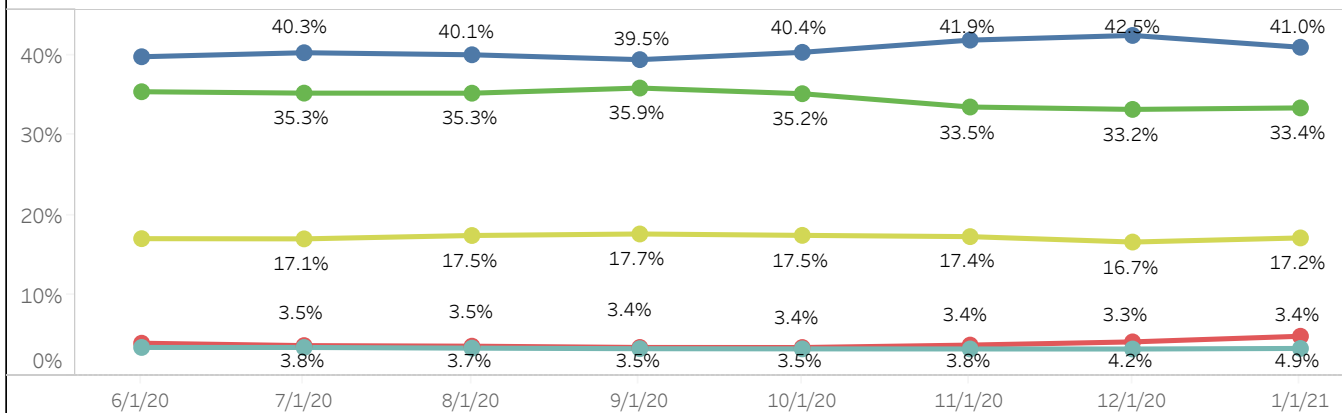
Payor Mix Monthly Analysis

Data as of 1/9/2021

Payor Mix is calculated based on encounter volume and the patient's primary insurance plan.

Nightly updates are received for encounter information. As providers validate or obtain insurance for patients it is added to the data set. We expect recent Self Pay numbers to be higher and to decrease over time as the insurance is updated.

Monthly Payor Type Percentage Change



Private Health Insurance

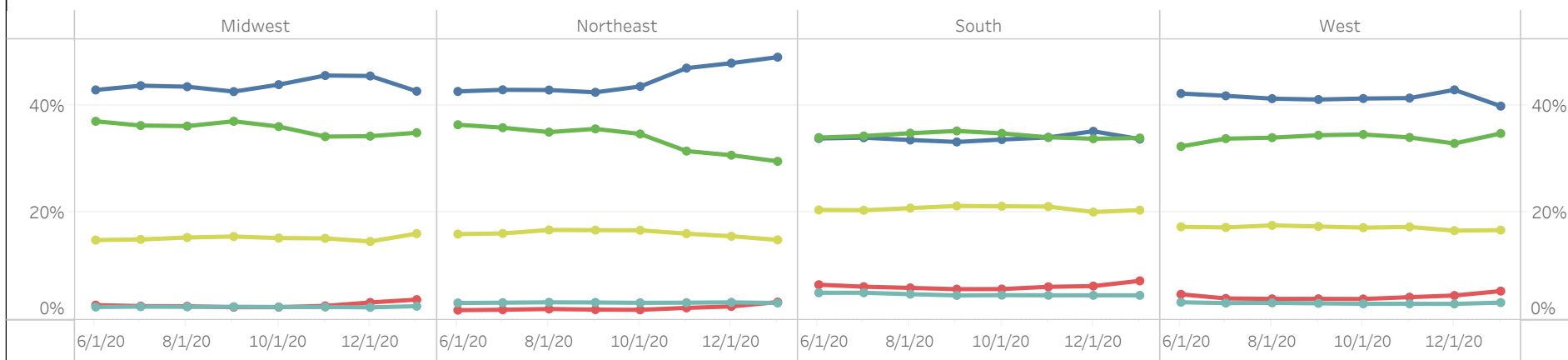
Medicaid/Medicaid Managed Care

Medicare/Medicare Managed Care

Other

Self Pay

Monthly Payor Type Percentage Change by Region



Methodology Page

Data Source: 68 StrataSphere® health systems with StrataJazz® Decision Support. All hospital billing encounters with nonzero charges were included. Once the encounter has charges greater than zero, it will then be included in the encounter count.

Patient Types include inpatient, observation patient, emergency patient, outpatient and newborn, which are determined by the presence of associated UB revenue codes in encounter charges.

Weekly change percentage is calculated by comparing current week patient volume with past 26 weeks rolling average volume.

Past 30 Day Change refers to the percentage difference between the sum encounter volume of the last 30 days of data, compared to the volume of the 30 days before that.

For the service line and procedure graphs: Service line and procedure groups provided by the Sg2 CARE Grouper™, based on the ICD-10 diagnosis and procedure codes, DRG codes, and CPT codes of each encounter.

For the COVID-19 summary graphs: COVID-19 infection status provided by the Sg2 CARE Grouper. Only encounters with ICD-10 diagnosis code U07.1 (indicating verified infection) are included.

GMLOS (Geometric mean length of stay) represents the nth root of the product of the LOS values for every COVID-19 inpatient admitted per day, where n is the number of patients per admit date. We chose this metric over average length of stay as it is less influenced by very high outliers.

For the payor mix analysis: the primary insurance plan is normalized by the StrataSphere machine learning payor model, encounters with a "not specified" payor are excluded.

Note: In the service line and procedure graphs observation and emergency patients are included in the outpatient volume for chart clarity.