State of Missouri COVID-19 Response Vaccine Distribution Analysis

July 19, 2021
This document includes COVID-19 data analysis for the State of Missouri in support of their vaccine ordering and distribution process.

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### COVID-19 Case Rate Hotspots

- Regional COVID-19 outbreak hotspots largely remained the same in **southwest Missouri**, focused primarily in:
  - Region D (Springfield, Joplin, and Branson)
  - Region I (Lebanon) and Region G (Ava)

### Vaccine Uptake Trends

- **Vaccine uptake intensified for the second straight week** within Region D, particularly in greater Springfield where COVID-19 hotspots are persistent, and in Region G
- Like last week, uptake **deserts remained smaller** in northeast (Region B) and southeast (Region E) in comparison to June trends

### Age-Cohort Analyses

- Vaccine initiations **increased approximately 3k** this week for the 18+ population – the highest number of weekly vaccine initiations **since the end of May**
- For the third week in a row, Regions D and G experienced the **highest percent of population initiating vaccination**

**Note:** Data on vaccinations include 1st round Moderna & Pfizer vaccinations and J&J vaccinations, are based on residence of the 18+ individual vaccinated (unless otherwise stated), and are from 07/14/2021. COVID-19 case rate data is a change analysis of rates (cases per 100k) using data from 7/2/21 to 07/16/21. Methodology, data sources, and limitations are available in the Appendix. Full data set provided in corresponding Excel file.
COVID-19 Case Rate Hotspot Analysis
For the time period between 7/2/21 and 7/16/21, the change in COVID-19 case rate (per 100,000) is displayed on the left and case rate hotspots (areas with statistically significant changes in case rates in comparison to surrounding areas) are displayed on the right.

**Case Rates and Statistical Hotspots**

Southwest Missouri (Region D) experienced second straight instance of sharp increases in case rates. Case rate increases were most intense in the greater Springfield area; while many other parts of Region D experienced decreases. Statistical hotspots largely remained consistent in comparison to last week's results.

**Note:** Data normalized by population (per 100,000 residents) per Census Tract. COVID-19 case rate data provided by the State of Missouri as of 07/16/21. Previous 2-week change view provided in the Appendix, along with methodology, data sources, and limitations.
Uptake Analysis

All Eligible Populations
Vaccination uptake hotspots are displayed in red from 7/6-7/13, indicating Census Tracts where vaccinations have been administered at rates significantly higher than State averages.

**Vaccine uptake activity intensified** for second straight week within **southwest Missouri** (Region D), particularly in greater Springfield.

Uptake was also high in **southcentral** (Region G) and **central Missouri** near Columbia and Jefferson City (Region F).

**St. Charles, St. Francois** (Farmington), and **Butler** (Poplar Bluff) Counties emerged with high regional uptake rates.

*Note:* Data on vaccinated individuals is based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, includes all ages, and indicates the residence of the individual vaccinated, and is as of 07/14/2021. Methodology, data sources, and limitations are available in the Appendix.
Vaccination uptake deserts are displayed in blue from 7/6-7/13, indicating Census Tracts where vaccination uptake is significantly lower than State averages.

### Vaccine Uptake Deserts at the Census Tract Level

- **High vaccine uptake**
- **High regional uptake**
- **Low regional uptake**
- **Low vaccine uptake**

#### Note:
Data on vaccinated individuals is based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, includes all ages, and indicates the residence of the individual vaccinated, and is as of 07/14/2021. Methodology, data sources, and limitations are available in the Appendix.

#### Vaccine uptake was elevated in southwest Missouri (Region D), central Missouri (Region F), and in the suburbs near St. Louis and Kansas City.

Uptake deserts in northeast (Region B) and southeast (E) **remained smaller** than in June as uptake remained constant.

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18+ Population Analysis
This table provides vaccination progress metrics at the regional level to understand how the share of vaccinations varies across the State.

<table>
<thead>
<tr>
<th>Regions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vaccination Gap (#)</strong></td>
<td>623k</td>
<td>91k</td>
<td>930k</td>
<td>417k</td>
<td>152k</td>
<td>187k</td>
<td>66k</td>
<td>102k</td>
<td>89k</td>
<td>2,658k</td>
</tr>
<tr>
<td><strong>% Unvaccinated Within Region</strong></td>
<td>53.8%</td>
<td>62.0%</td>
<td>47.2%</td>
<td>57.7%</td>
<td>60.8%</td>
<td>47.8%</td>
<td>66.3%</td>
<td>54.9%</td>
<td>66.6%</td>
<td>52.5%</td>
</tr>
<tr>
<td><strong>Share of Eligible Statewide Population</strong></td>
<td>22.9%</td>
<td>2.9%</td>
<td>38.9%</td>
<td>14.3%</td>
<td>4.9%</td>
<td>7.7%</td>
<td>2.0%</td>
<td>3.7%</td>
<td>2.6%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Share of Statewide Vaccinations</strong></td>
<td>22.3%</td>
<td>2.3%</td>
<td>43.3%</td>
<td>12.8%</td>
<td>4.1%</td>
<td>8.5%</td>
<td>1.4%</td>
<td>3.5%</td>
<td>1.9%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Share of Statewide Remaining Unvaccinated</strong></td>
<td>23.5%</td>
<td>3.4%</td>
<td>35.0%</td>
<td>15.7%</td>
<td>5.7%</td>
<td>7.0%</td>
<td>2.5%</td>
<td>3.8%</td>
<td>3.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Regions C and F** lead the State having vaccinated the largest % of their populations, while **Regions I and G** have the **highest % unvaccinated**

**Regions C and D** remain the two regions with greater than a 1% difference between their **shares** of eligible statewide **population** and of statewide **vaccinations**

**Note:** Data on vaccinations include 1st round Moderna & Pfizer vaccinations and J&J vaccinations, are based on residence of the 18+ individual vaccinated (unless otherwise stated), and are from 07/14/2021. Methodology, data sources, and limitations are available in the Appendix. Cells outlined in green indicate a greater than 1 percentage point discrepancy between share of eligible statewide population and share of statewide vaccinations.
18+ Regional Vaccination Rates Over Time

This visualization displays the weekly change in percent vaccinated in each region over the last 5 weeks for the over 18 population.

18+ Additional Percent of Population Vaccinated by Region (Week 23 to Week 27)

Note: All weeks are calendar weeks, defined by SMV using MMWR week, where Week 27 is 7/4 – 7/11. Data on vaccinations include 1st round Moderna & Pfizer vaccinations and J&J vaccinations, are based on residence of the 18+ individual vaccinated (unless otherwise stated), and are from 07/14/2021. J&J vaccinations are coded as both dose 1 and dose 2. Methodology, data sources, and limitations are available in the Appendix.

KEY OBSERVATIONS

- Vaccine initiations increased approximately 3k this week
  - Week 27 experienced the highest number of vaccine initiations since Week 21

- For the third week in a row, Regions D and G vaccinated the highest percentage of their 18+ population
  - For both Regions, it was the largest number of vaccine initiations in over two months

- Region B was the only region that experienced a decrease in vaccine initiations in Week 27
Priority Counties by Vaccination Gap & Percent Unvaccinated

Missouri counties are ranked by vaccination gap (the number of residents estimated to be unvaccinated and eligible) and percent unvaccinated (estimate of the percent of eligible residents that have not been vaccinated) for the over 18 population – based on vaccine initiations, not including second dose vaccinations.

### TOP 5 COUNTIES BY VACCINATION GAP (#)

<table>
<thead>
<tr>
<th>Rank</th>
<th>County</th>
<th>Vaccination Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>St. Louis</td>
<td>393,400</td>
</tr>
<tr>
<td>2.</td>
<td>Jackson</td>
<td>302,400</td>
</tr>
<tr>
<td>3.</td>
<td>St. Charles</td>
<td>158,300</td>
</tr>
<tr>
<td>4.</td>
<td>Greene</td>
<td>119,200</td>
</tr>
<tr>
<td>5.</td>
<td>Jefferson</td>
<td>112,400</td>
</tr>
</tbody>
</table>

### TOP 5 COUNTIES BY UNVACCINATED (%)

<table>
<thead>
<tr>
<th>Rank</th>
<th>County</th>
<th>Percent Unvaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pulaski*</td>
<td>78.8%</td>
</tr>
<tr>
<td>2.</td>
<td>Clark</td>
<td>75.4%</td>
</tr>
<tr>
<td>3.</td>
<td>Putnam</td>
<td>74.2%</td>
</tr>
<tr>
<td>4.</td>
<td>Ozark</td>
<td>73.3%</td>
</tr>
<tr>
<td>5.</td>
<td>Scotland</td>
<td>73.2%</td>
</tr>
</tbody>
</table>

*Pulaski has the highest percent unvaccinated, likely due to the large military presence and missing federal vaccination data.

**Note:** Data on vaccinations include 1st round Moderna & Pfizer vaccinations and J&J vaccinations, are based on residence of the 18+ individual vaccinated, and are from 07/14/2021. Methodology, data sources, and limitations are available in the Appendix. Green circles indicate the magnitude of change week over week – a numerical difference between the 2 weeks for vaccination gap and a percentage point difference for percent unvaccinated. Blue indicates a county new to the list in comparison to last week. ▲ ◀ indicates increase and decrease in rank since last week, respectively. Full data set provided in corresponding Excel file.
Cumulative Vaccination Gap and Percent Unvaccinated for Eligible Populations

Darker shades on the map on the left indicate Census Tracts with larger vaccination gaps and on the right higher percentages of unvaccinated (for the 18+ population)

Areas with the largest vaccination gaps continue to align with the more urban areas of highest population across Missouri Census Tracts with the highest percentages of unvaccinated populations are concentrated in more rural areas in Regions B, D, I, G, & E

Note: Data on vaccinations include 1st round Moderna & Pfizer vaccinations and J&J vaccinations, are based on residence of the 18+ individual vaccinated (unless otherwise stated), and are from 07/14/2021. Methodology, data sources, and limitations are available in the Appendix. Full data set provided in corresponding Excel file.
Statewide Geospatial Visualization of COVID-19 Vulnerable Populations

The graph below visually depicts the updated COVID-19 Vulnerability Index – focus areas are consolidated in urban, low socio-economic and minority-focused communities.

**FACTORS CONTRIBUTING TO VULNERABILITY**
- COVID-19 Case Burden
- Living below 138% of the Federal Poverty Level
- 1 or more medical comorbidity
- Minority populations
- Percent Unvaccinated

**KEY OBSERVATIONS**
- The most vulnerable regions within the State of Missouri remain in the urban cores of Kansas City and St. Louis.
- Only 4 regions are represented in the Top 150 most vulnerable Census Tracts in Missouri – Regions C, A, E and D (in order of CTs appearing in top 150).

**Note:** Data on vaccinated individuals are based on 1st round Moderna and Pfizer vaccinations and J&J vaccinations, based on the residence of the individual (18+) vaccinated, and as of 07/14/21. COVID-19 case rate provided by the State of Missouri as of 7/16/21. Methodology, data sources, and limitations are available in the Appendix. Vaccination rates larger than 1 were set to 1 due to identified data quality issue that is being investigated.
Statewide Top 10 Census Tracts by the COVID-19 Vulnerability Index

Below are the top 10 Census Tracts across Missouri with the highest COVID-19 Vulnerability Index scores – notably all in the St. Louis and Kansas City areas

<table>
<thead>
<tr>
<th>Vulnerability Index Rank</th>
<th>Census Tract</th>
<th>County</th>
<th>18+ Population</th>
<th>Variables Included in the CVI</th>
<th>Additional Demographic Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unvaccinated as of 7/15/21 (%)</td>
<td>Cumulative COVID-19 Case Burden as of 7/16/21 (# per 100k)</td>
</tr>
<tr>
<td>1</td>
<td>29510106200</td>
<td>St. Louis City</td>
<td>980</td>
<td>67.14%</td>
<td>7,793</td>
</tr>
<tr>
<td>2</td>
<td>29189212002</td>
<td>St. Louis County</td>
<td>2,196</td>
<td>63.25%</td>
<td>17,382</td>
</tr>
<tr>
<td>3</td>
<td>29095013203</td>
<td>Jackson County</td>
<td>2,837</td>
<td>68.70%</td>
<td>10,366</td>
</tr>
<tr>
<td>4</td>
<td>29189212200</td>
<td>St. Louis County</td>
<td>5,797</td>
<td>66.86%</td>
<td>5,523</td>
</tr>
<tr>
<td>5</td>
<td>29095005602</td>
<td>Jackson County</td>
<td>1,321</td>
<td>66.31%</td>
<td>8,357</td>
</tr>
<tr>
<td>6</td>
<td>29189213900</td>
<td>St. Louis County</td>
<td>1,389</td>
<td>68.75%</td>
<td>7,962</td>
</tr>
<tr>
<td>7</td>
<td>29189213800</td>
<td>St. Louis County</td>
<td>4,763</td>
<td>66.89%</td>
<td>7,826</td>
</tr>
<tr>
<td>8</td>
<td>29189212102</td>
<td>St. Louis County</td>
<td>2,286</td>
<td>72.09%</td>
<td>5,621</td>
</tr>
<tr>
<td>9</td>
<td>29510107500</td>
<td>St. Louis City</td>
<td>2,287</td>
<td>70.53%</td>
<td>7,024</td>
</tr>
<tr>
<td>10</td>
<td>29510109700</td>
<td>St. Louis City</td>
<td>1,886</td>
<td>66.12%</td>
<td>7,784</td>
</tr>
</tbody>
</table>

Statewide Census Tract Average: 51.48% 8,822 29.86% 20.43% 21.64% 17.42% 15.17% 9.98%

Note: Data on vaccinated individuals are based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, based on the residence of the individual (18+) vaccinated, and as of 07/14/21. COVID-19 case rate provided by the State of Missouri as of 7/16/21. Methodology, data sources, and limitations are available in the Appendix.
12-17 Population Analysis
The graph below shows the distribution of each county's percent unvaccinated for the 12-17 population, colored by urban/rural designation. For example, there are 3 counties (2 urban, 1 rural) that have an unvaccinated percent between 80% and 82.5%

KEY OBSERVATIONS

- The **stark divide** in 12-17 year-old vaccine uptake between rural and urban counties remains persistent.
- **St. Louis County** has the lowest percent unvaccinated for the 12-17 population (53%).
- Regions G, B, and E have an unvaccinated rate of greater than 90% (in order of highest to lowest); Region C, A, and F have an unvaccinated rate lower than 80%

Note: Urban/Rural designation defined from Census. All weeks are calendar weeks, defined by ShowMeVax (SMV), where Week 27 is 7/5 – 7/11. Data on vaccinated individuals are based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, based on the residence of the individual vaccinated, and as of 07/14/2021. All vaccinations tagged to the “<18” age group were assumed to be between ages 12-17. Individuals who received a vaccine not tagged to a county were filtered out. Methodology, data sources, and limitations are available in the Appendix.
The graph below depicts the total vaccinations administered over the past 5 weeks, comparing the share of vaccinations that have gone to the 12-17 population versus the over 18 population.

**KEY OBSERVATIONS**

- Vaccine initiation *decreased slightly* for 12-17 population.
- The *share of initiations* for the 12-17 population *decreased from 18% to 15%* from Week 26 to Week 27.
- The past four weeks have seen just over *1%* of the 12-17 population vaccinated.

**Note:** All weeks are calendar weeks, defined by MMWR pulled from SMV where Week 27 is 7/5 – 7/11. Data on vaccinated individuals are based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, based on the residence of the individual vaccinated, and as of 07/14/2021. All vaccinations tagged to the "<18" age group were assumed to be between ages 12-17. Individuals who received a vaccine not tagged to a county were filtered out. Methodology, data sources, and limitations are available in the Appendix.
12-17 Year-olds | Remaining Unvaccinated

Darker shades on the map on the left indicate counties with larger vaccination gaps and on the right higher percentages of unvaccinated (for the 12-17 population).

**VACCINATION GAP (#)**

**PERCENT UNVACCINATED (%)**

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**Region C** continues to have the **largest 12-17 year-old vaccination gap** (112,694), while **Region G** has the highest % **unvaccinated** (94.7%).

Clay and St. Louis City counties have now vaccinated **more than 35% of their 12-17 population** – joining St. Louis, Boone, and Platte Counties.

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**Note:** Data on vaccinated individuals are based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, based on the residence of the individual vaccinated, and as of 07/14/2021. All vaccinations tagged to the “<18” age group were assumed to be between ages 12-17. Analysis ran at the county level due to several Census Tracts still with limited uptake thus far. Null counties were filtered out. Methodology, data sources, and limitations are available in the Appendix. Full data set provided in corresponding Excel file.

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12-17 Year-olds | Vaccine Uptake

Darker shades on the map indicate counties with larger numerical vaccination uptake (for the 12-17 population)

**Vaccine Initiation by County (#)**

<table>
<thead>
<tr>
<th>Quintiles (#)</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 – 53</td>
<td></td>
</tr>
<tr>
<td>53 – 87</td>
<td></td>
</tr>
<tr>
<td>87 – 181</td>
<td></td>
</tr>
<tr>
<td>181 – 427</td>
<td></td>
</tr>
<tr>
<td>427 – 35,302</td>
<td></td>
</tr>
</tbody>
</table>

**Key Observations**

- Eight of the top 10 counties with the highest number of vaccinations for individuals aged 12-17 are within Regions A & C
  - St. Louis, Jackson, and St. Charles counties represent the top 3 counties with the most vaccinations for individuals aged 12-17
- 11 counties have vaccinated fewer than 20 individuals within the age 12-17 cohort – largely in rural areas in the north and south of the State (depicted in gray)

**Note:** Data on vaccinated individuals are based on 1st round Moderna & Pfizer vaccinations and J&J vaccinations, based on the residence of the individual vaccinated, and as of 07/14/2021. All vaccinations tagged to the "<18" age group were assumed to be between ages 12-17. Analysis ran at the county level due to several Census Tracts still with limited uptake thus far. Null counties were filtered out. Methodology, data sources, and limitations are available in the Appendix.
Appendix
For the time period between 6/25/21 and 7/9/21, COVID-19 case rate (per 100,000) change is displayed on the left and case rate hotspots (areas with statistically significant changes in case rates in comparison to surrounding areas) are displayed on the right.

### Case Rates and Statistical Hotspots

**Region D**, including **Springfield and Joplin**, experienced sharp increases in cases from 2 weeks prior. Hotspots again were largely focused within **Region D** while previous hotspots in **Region E** moderated somewhat.
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- Content is populated by proprietary and publicly available sources, both of which are non-static and continuously updating.

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