

Childhood Vaccination Rates Mount U-Shaped Recovery After Plunging During First Weeks of COVID-19

Down 50% at Low Point, Vaccination Rates Are Recovering Nationally, but Gaps Remain

KEY FINDINGS:

- Childhood vaccination rates fell precipitously beginning in mid-March 2020, hitting a low point the week of April 6, 2020, when routine immunizations fell by 50% versus the same week in 2019.
- Since that April low point, childhood vaccination rates have staged a U-shaped recovery, with weekly vaccine rates normalizing to those of 2019 starting the week of June 22.
- Childhood vaccination rates of decline and recovery varied on a state-by-state basis but followed a similar trendline nationwide. Delaware, New Jersey, New York, and Michigan saw the sharpest declines, each experiencing declines in pediatric vaccination rates of 70% or more during the week of April 6, 2020. Even in states that were experiencing relatively few COVID-19 cases and did not issue mandatory stay-at-home orders during March and April, pediatric vaccination rates declined significantly in late March/early April 2020.
- Other CDC-recommended vaccinations, such as HPV, experienced sharper declines and slower recovery.

EXECUTIVE SUMMARY:

Routine childhood immunizations have become a focal point for public health officials evaluating the ripple effects of COVID-19. The Centers for Disease Control and Prevention [reports](#) that childhood vaccination rates have dropped nearly 15% so far this year due to disruptions in routine preventive and nonemergency care caused by the pandemic. As a result, many children are facing the start of the school year with incomplete vaccination compliance.

Providers, schools, and health officials around the country have been scrambling to address the decline, each with a slightly different approach. City leaders in Richmond, VA, launched a [“Don’t Wait, Vaccinate!” campaign](#) to coincide with National Immunization Awareness Month. In Louisville, KY, pediatricians are calling the situation a “community emergency” as they report the [lowest child immunization rates they’ve ever seen](#). Meanwhile, Pennsylvania’s Department of Health has [temporarily suspended requirements](#) for children’s vaccines.

This fragmented, highly localized approach is consistent with the anecdotal nature of the data on nationwide trends in child immunizations during COVID-19. It is challenging to develop a timely, nationwide snapshot of the real trend in childhood vaccination rates due to delayed reporting and disparate data sources.

In order to provide a more timely, holistic snapshot of the impact of COVID-19 on deferral or delay of routine child immunizations, we assessed the two-year trend in the volume of claims for common pediatric vaccines. Tracking real-world patient data on a nationwide basis, and evaluating weekly screening frequency for the first 28 weeks of 2020 versus the first 28 weeks of 2019, we were able to chart the nationwide trend in vaccine volume.

The analysis found that childhood vaccination rates plummeted during the first several weeks of mandatory stay-at-home orders, falling 50% below 2019 levels during the week of April 6, 2020, alone. Since that low point, however, weekly vaccine rates have begun a U-shaped recovery.

METHODOLOGY:

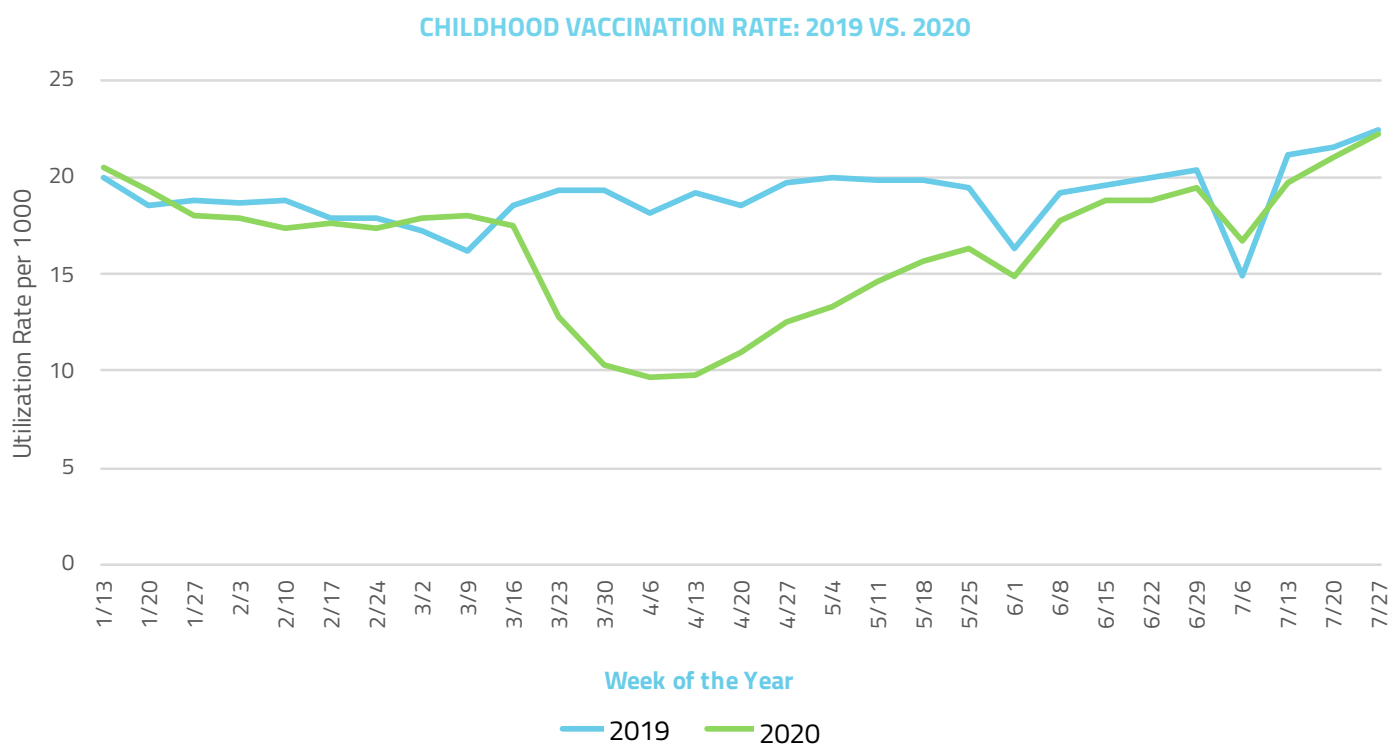
This analysis used Komodo's Healthcare Map of 320 million U.S. patient journeys to evaluate recent trends in pediatric vaccination rates. We reviewed medical codes associated with 12 routine childhood vaccines that are typically mandated for enrollment in public schools: pertussis, tetanus, diphtheria, hepatitis B, polio, pneumococcal, rotavirus, H. flu, measles, mumps, rubella, and varicella. We also evaluated trends in HPV vaccines. We excluded flu vaccines from this analysis to reduce the effect of seasonality on the dataset.

The total number of administered vaccines was tracked on a national and state-level basis for the first 28 weeks of 2019 and compared to the first 28 weeks of 2020. Vaccination rates were then compared with the two time periods for all patients 18 and under.

We attempted to control for common nonclinical sources of variation including lags in data processing and ingestion from point-of-care to Komodo's Healthcare Map. In comparing the total number of administered vaccines on a national and state-level basis throughout the U.S. for the first 28 weeks of 2019 versus the same period of 2020, we did not control for potential changes in the populations that need to be vaccinated (e.g., due to shifts in birth rates or state requirements) from one year to the next. The research also did not control for possible changes in the percentage of uninsured patients who would not be captured in claims data in the population in 2019 versus 2020. The pediatric population in the study was defined as all patients 18 and under to control for the lack of age-specific precision in de-identified pediatric data sets.

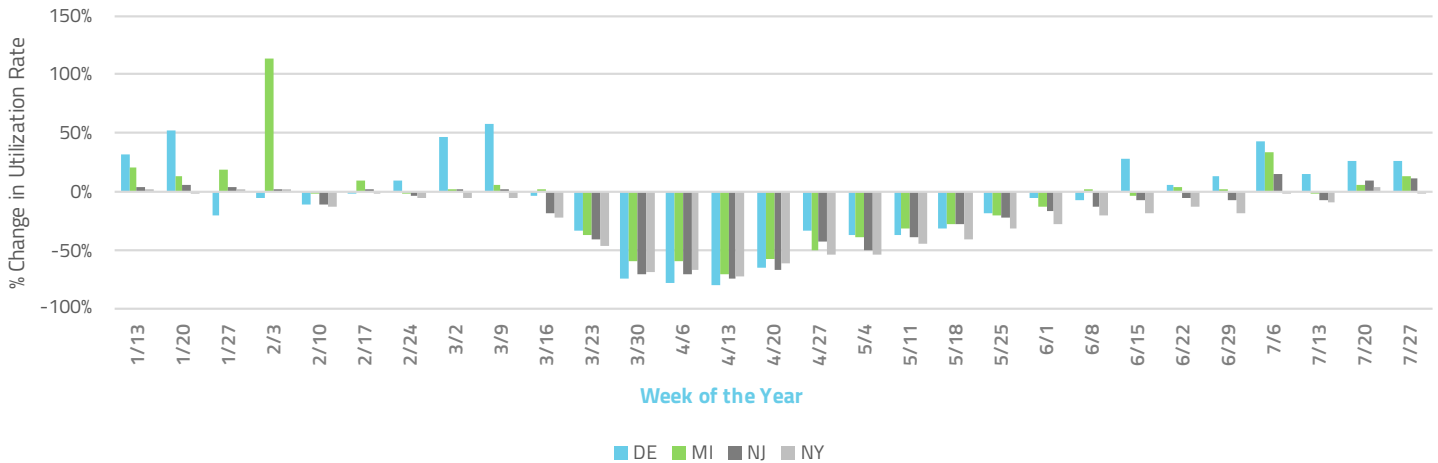
RESULTS:

Childhood Vaccinations Show U-Shaped Recovery: In mid-March 2020, childhood vaccinations began to fall precipitously across the U.S., hitting a low point the week of April 6, 2020, when routine child immunizations were 50% lower than the same week in 2019. Weekly immunization rates continued to stay significantly suppressed versus 2019 totals throughout April and May, though the magnitude of decline became smaller with each month. By the week of May 25, 2020, the weekly childhood immunization rate was just 6% below the rate seen in the same week of 2019. Starting the week of June 22, 2020, vaccination rates began to match rates seen in 2019.



Immunization Rates Vary Widely by State During COVID-19: Pediatric immunization rates fell sharply during April in multiple states in the Northeast and Midwest. The sharpest weekly declines were seen in Delaware, where childhood immunization rates fell by 80% versus 2019 totals during the week of April 6, 2020. Delaware was followed closely by New Jersey, which fell by 73%, New York, which fell by 72%, and Michigan, which fell by 70% during the same week.

CHILDHOOD VACCINES UTILIZATION RATE CHANGE FROM 2019 TO 2020



Though peak COVID-19 infection rates varied by region — with the Northeast reaching its peak infection rate in late March and the Sunbelt reaching its peak in mid-July — pediatric vaccination rates across the nation hit their lowest levels the first two weeks in April, coinciding with the peak COVID-19 surge in the Northeast.

Florida, for example, reached its steepest decline in pediatric vaccination rates (-44%) the week of April 6. Arizona (-46%) and Texas (-47%) hit their low points versus 2019 the week of March 30.

Even in states that experienced relatively few early COVID-19 cases and did not issue stay-at-home orders during March and April, pediatric vaccination rates declined significantly in early April of 2020. Arkansas and North Dakota pediatric vaccination rates fell 52% during the week of March 23, while Nebraska’s fell 38% during that same week. Wyoming hit its low the week of March 30, falling 59%. Utah’s child vaccination rate fell 39% during the week of April 6. Iowa’s pediatric vaccination rate fell 50% and South Dakota’s fell 49% during the week of April 13.

Other CDC-Recommended Vaccines See Sharper Decline, Slower Recovery: The overall magnitude of the decline in vaccination rates was even more pronounced among other CDC-recommended vaccines, such as for the human papillomavirus (HPV). Nationally, pediatric vaccine rates for Gardasil, the most widely used HPV vaccine, fell by 74% during the week of April 6, 2020, 75% during the week of April 13, 2020, and 76% during the week of April 20, 2020, compared to the same weeks in 2019. Gardasil administration rates have since begun to recover, although less so than other routine childhood vaccines. During July, Gardasil utilization rates remained about 10% lower than the same time period in 2019.

DISCUSSION:

Economic experts have recently lauded the potential for a U-shaped recovery as a desirable outcome following a financial crisis on the scale of what we’ve seen with the COVID-19 pandemic. Immunizations, however, are not the same as GDP.

Routine child vaccinations are a vital link to maintaining herd immunity against many debilitating diseases. The reason we no longer see nationwide mumps or polio pandemics is that 90% to 95% of children are immunized against those diseases. Any significant drop in the standard of vaccine compliance in the pediatric population introduces a new set of risks that could set the stage for serious public health problems in the future. For example, measles outbreaks in 2014 and 2018 are attributed to non-compliance with vaccination schedules in pockets of the U.S. population. Such an outbreak, on top of COVID-19 public health concerns, could further cripple communities’ economic recovery, school reentry plans, health facility safety, and overall health.

At the state level, it is notable that every state in the country experienced significant declines in pediatric vaccination rates, which reached their lowest levels during the first two weeks of April — even though COVID-19 infection rates did not peak in many states until June and July. This trendline speaks to the power of media attention and widespread awareness of public health issues driving behavior on a national scale.

The continued reduction in HPV vaccinations may be related to the frequency of physician visits that is typical in the age group — 9 and older — indicated for Gardasil. Many of these children may not visit their healthcare provider again until next year. Adherence to HPV vaccines has been [shown](#) to reduce cervical cancer diagnoses, and continued compliance with HPV vaccination is important to prevent the future prevalence of cervical cancer.

It is encouraging that the curve in vaccination rates is now trending upwards, reaching levels that appear to be normal compared to last year. However, many healthcare providers across the country will be working through the remainder of the year to promote adherence and ensure their patients “catch up” on their vaccine schedules. To that end, the CDC recommends that healthcare providers use reminder and recall systems, assess vaccine status at all patient visits, and actively communicate with patients and their families about how they can be safely vaccinated during the pandemic.

It will be critical for federal and local health authorities to continue to spread the word about the importance of vaccinations. Recently, health experts have warned of the potential dangers of the coming flu season in the fall of 2020 on top of COVID-19, and it is more important than ever for the entire population to inoculate themselves against the seasonal influenza virus. It is also crucial for our health authorities to monitor these and other ripple effects of COVID-19 to minimize adverse outcomes stemming from the pandemic’s disruption to our healthcare system.

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