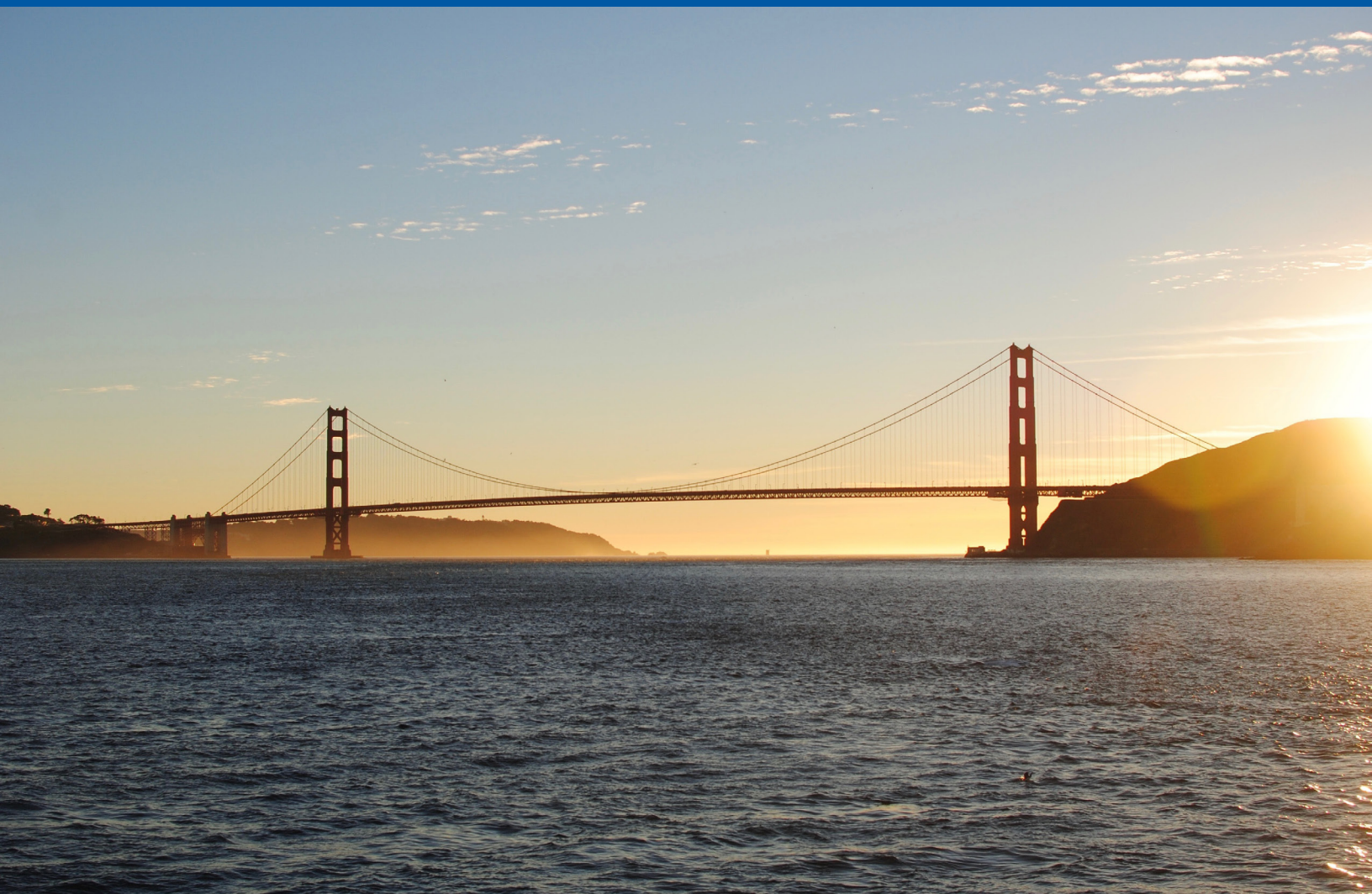


Pandemic Aftershocks: Examining the Decline in Healthcare Utilization in California During COVID-19

California Healthcare System Tracking Project



Manifest
MEDEX



Summary of Key Findings

How did the COVID-19 pandemic impact the health of Californians beyond the virus? What will be the impact of missed medical and preventive care in 2020? How can we catch up quickly?

Manifest MedEx, California's largest nonprofit health information network, completed an analysis of the impact of COVID-19 on healthcare utilization in California in 2020 to explore these questions. The following is a summary of key findings, based on an analysis of a longitudinal cohort of just over 4 million Californians, about 10% of the state's population:

- In addition to the many people who have experienced COVID-19 directly, the disease has also disrupted medical care for Californians.
- Between March and mid-April 2020, ambulatory visit volumes across the state fell by more than 50%. Although visits quickly rebounded, volumes in the second half of the year remained about 20% below baseline levels.
- Ambulatory visit declines for children (36%) and adolescents (25%) were substantially greater than for adults. Although some of this differential may be due to fewer respiratory infections, it is cause for concern.
- Total medical claims volumes fell slightly more for Medi-Cal patients (21%) than for commercially insured patients, who experienced a 19% decline.
- The volume of preventive services, such as mammography, colorectal cancer screening, and cervical cancer screening, fell 20% – 41% in 2020. It will be important to catch up quickly on these

screening services and monitor whether cancers are diagnosed at later stages across the next few years.

- In contrast, volumes for other services, such as hip arthroplasty and PET scans, were down only modestly for the year.

Research Context

COVID-19 has had a pervasive effect on the entire world, including the population of California. As of late May 2021, the state had recorded almost 3.7 million cases and more than 62,000 deaths due to **COVID-19**. Minority populations have been disproportionately impacted, with **Latinos** and **Filipinos** experiencing especially high infection rates. The pandemic has also been harmful for California's economy: The state lost **1.5 million jobs** between February and December 2020, with **women of color being particularly hard-hit**. There have also been anecdotal reports of **increases in serious mental health problems among teens**, who have experienced social isolation. Education has been disrupted and families with young children placed under **financial and emotional stress**.

And yet there are ample grounds for optimism. As of May 31, 2021, **70%** of the state's population had received at least one COVID-19 vaccine dose, and new

COVID-19 hospitalizations were down over **93%**.

As the direct toll of COVID-19 abates, it is important to understand and address the indirect effects of the pandemic. During the early stages, many physician practices shut down or provided services mainly for urgent problems. For patients, these disruptions and fear of contracting COVID-19 caused many to avoid care (including care for serious conditions), raising the prospect of **adverse short- and long-term outcomes**.

Introduction to Manifest MedEx and the California Healthcare System Tracking Project

This report examines how COVID-19 has affected healthcare utilization in California so that healthcare providers and leaders can address gaps and plan for future public health events.

Manifest MedEx is California's largest nonprofit health information network, bringing together claims and clinical data for 26 million Californians. Using these longitudinal records, Manifest MedEx notifies clinicians when their patients have received care elsewhere or have had an urgent medical event and helps them assess and improve the health of their patient populations. This report offers key insights to support that work, providing a snapshot of health care services in California through the end of 2020.

Methodology

To assess how COVID-19 is affecting non-COVID medical care, we assembled a longitudinal cohort of approximately 4 million Californians, about 10% of the state's population. These individuals were continuously

covered by the same insurer throughout the study period, allowing us to chart the impact of the pandemic on a substantial number of Californians across time. The sample covers roughly 23% of all commercially insured individuals in the state, 4% of the state's Medi-Cal beneficiaries, and 6% of Medicare beneficiaries. These individuals reside in counties across the state. In one analysis that looked only at 2020, we used a larger cohort of 5.3 million individuals who were continuously enrolled with the same insurer across that time period.

At the same time, our sample has important limitations. Data on the race and ethnicity of patients were often unavailable or challenging to use, which prevented us from analyzing data by race or ethnicity and conducting a range of analyses around equitable access to medical services. A key priority for Manifest MedEx is to work with our provider and health plan participants to improve the volume and quality of race and ethnicity data we receive.

Our sample also did not include very young children. Children younger than two years old in December 2020 did not meet our cohort inclusion requirement for having two years of health history. Trending for three- and four-year-olds would have been complex, given varying expectations around visit frequency for children under five. We therefore only considered children five years and older.

Although our longitudinal sample allowed us to be rigorous about trending, it did not (by definition) include people who moved across different insurers or who were uninsured; an individual had to be continuously covered by a given insurer to be included in the sample.

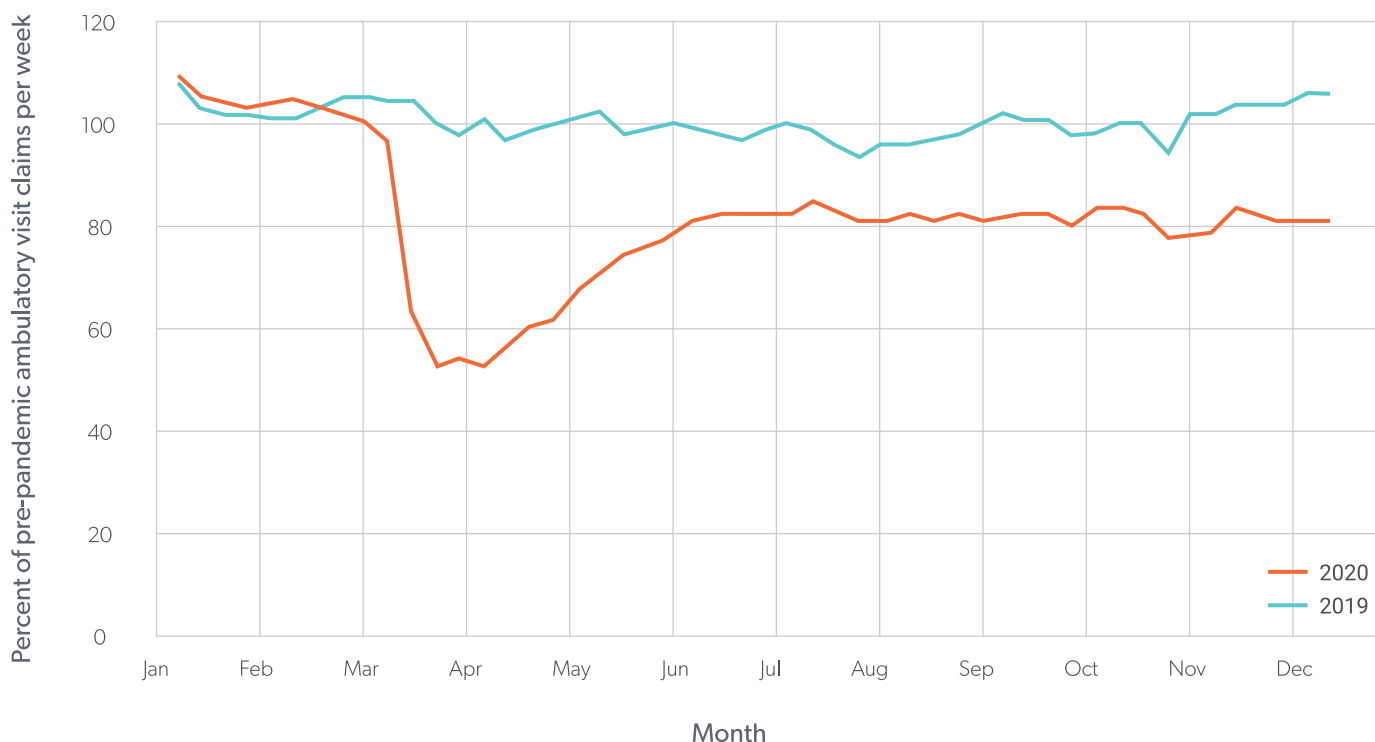
Finally, the sample covered a smaller percentage of individuals with Medi-Cal coverage, giving us less visibility into this population.

Ambulatory Visit Volumes Decreased During COVID-19

At the outset of the pandemic, health care leaders were concerned that COVID-19 would lead to care avoidance. Chart 1 shows that such concerns were well founded as volumes for both in-person and telemedicine care in California remained below the 2019 baseline throughout 2020. Ambulatory visit

volumes across 2019 (depicted by the red line) were relatively constant across the year. Volumes then fell steeply beginning in late March 2020, declining to a low of 50% below pre-pandemic levels. Beginning in April 2020, visits stabilized and then rebounded to a level about 20% below 2019 levels.

Chart 1: Change in California Ambulatory Visit Volumes, 2019–2020



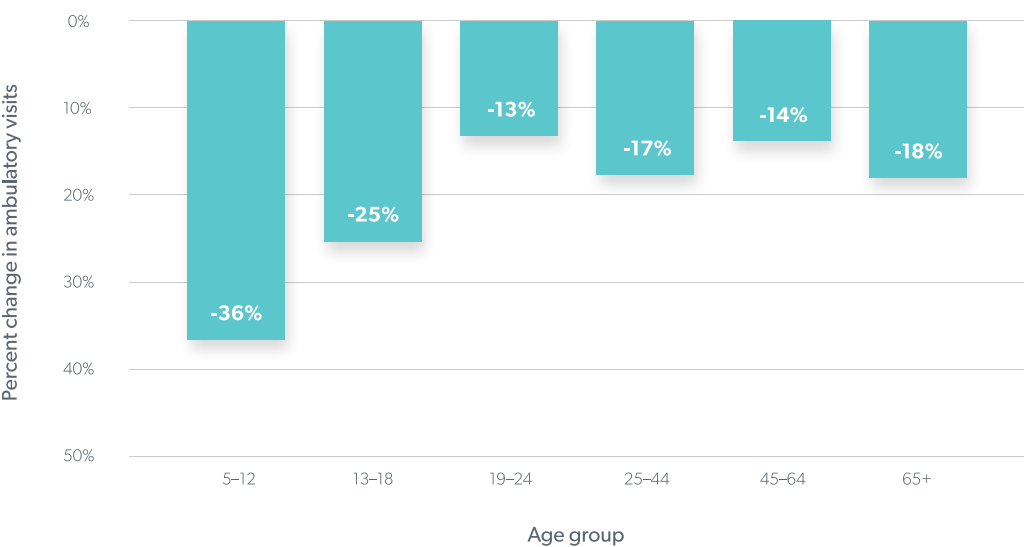
Note: Includes data for 14,383,266 office visit and telemedicine claims from January 1, 2019 through December 31, 2019, and 11,798,309 office and telemedicine claims from January 6, 2020 through December 14, 2020. Some claims may be missing due to lag time for the claims adjudication process. Based on claims data from a query run on April 4, 2021. Physical office visits are defined as claims with the following procedure codes: 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99215, while telemedicine office visits are defined as claims with the following procedure codes: G0425-7, G2025, G0406-8, G0459, G0508-9, 0188T, 99441, 99442, 99443, 98966, 98967, 98968. Sample consists of California residents who were continuously enrolled with the same insurer across 2019 and 2020. The data are indexed to the mean number of weekly visits in January and February 2020. In order to clearly depict the overall trend, data from weeks with holidays were excluded and replaced with the mean number of visits from the week prior to and following the week with the holiday.

Volume Drop Was Especially Steep for Children and Adolescents

Health officials and experts have been concerned about the effects of care disruption on **children during the pandemic**. Indeed, the decline in ambulatory visit volumes for adolescents (25%) and children over five years old (36%) was larger than for adults. Given warnings about mental health problems experienced by children and adolescents during the pandemic, as well as their need for immunizations and other preventive care, these changes are concerning. On the other hand, the winter of 2020/2021 was notable for the low levels of flu and other respiratory diseases

due to mask wearing, virtual schooling, and physical distancing. Fewer respiratory infections could explain part of the decline in care volumes, as could fewer visits required by schools and sports teams. Nevertheless, it is worrying that children are having less contact with their pediatricians and their teachers, both of whom play a key role in identifying medical, developmental, and social issues that could place children at risk. As COVID-19 cases decline, it will be important to closely monitor the medical utilization patterns of Californian children.

Chart 2: Percent Change in California Ambulatory Visits by Age Group, 2019-2020

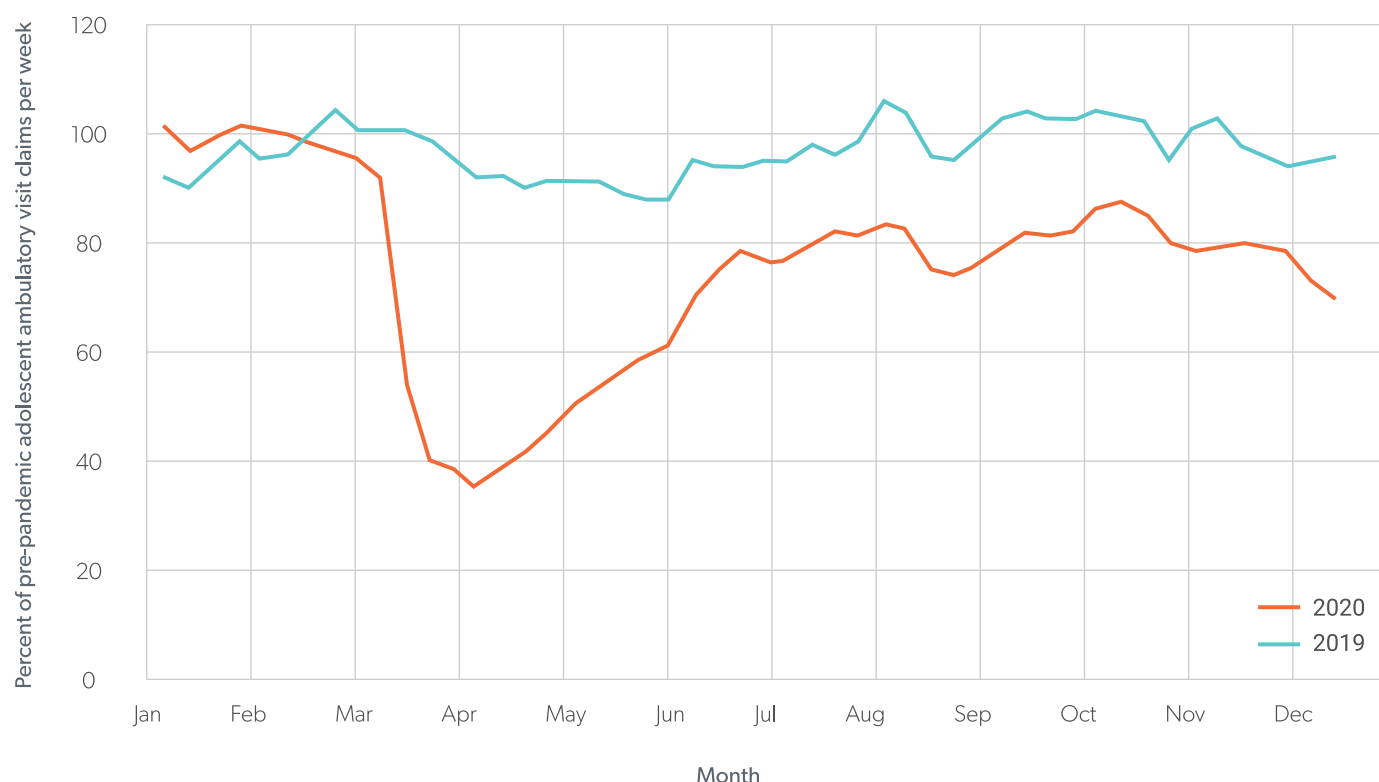


Note: Includes data for 13,442,348 claims from January 1, 2019, through December 31, 2019, and 11,017,593 claims from January 6, 2020, through December 14, 2020. Some claims may be missing due to lag time for the claims adjudication process. Based on office and telemedicine claims data from a query run on April 7, 2021. In order to clearly depict the overall trend, data from weeks with holidays were excluded and replaced with the mean number of visits from the week prior to and following the week with the holiday.

A closer look at health care utilization of adolescents adds additional perspective. Chart 3 shows ambulatory visit volumes for adolescents (aged 13-18) across time. Prior to the onset of the pandemic, utilization

was slightly higher in 2020 compared with 2019. By mid-April, visits had dropped 64%. Although volume partially rebounded over the summer, similar to adults, utilization continued to run below 2019 levels.

Chart 3: Adolescent Ambulatory Visits Volumes in California



Note: Includes data for 1,573,272 claims from January 1, 2019, through December 31, 2019, and 1,224,807 claims from January 6, 2020, through December 14, 2020. Some claims may be missing due to lag time for the claims adjudication process. Based on office and telemedicine claims data from a query run on April 7, 2021. The data are indexed to the mean number of weekly visits in January and February 2020. In order to clearly depict the overall trend, data from weeks with holidays were excluded and replaced with the mean number of visits from the week prior to and following the week with the holiday.

Volume Declines Roughly Comparable Across Payer Types

Equity and disparity issues have figured prominently across the pandemic, as COVID-19 has disproportionately affected lower-income communities. In the Manifest MedEx sample, declines in total claims volumes were roughly comparable across payer types. They were incrementally larger for the Medi-Cal population (21%) than for commercially insured or Medicare Advantage beneficiaries (who experienced 19% and 18% declines, respectively).

Table 1: Volume Declines by Payer Type

Insurer	Beneficiaries	% Change in Claims 2019-2020
Commercial	3,262,031	-19%
Medi-Cal	386,021	-21%
Medicare Advantage	389,725	-18%
Total	4,037,777	-19%

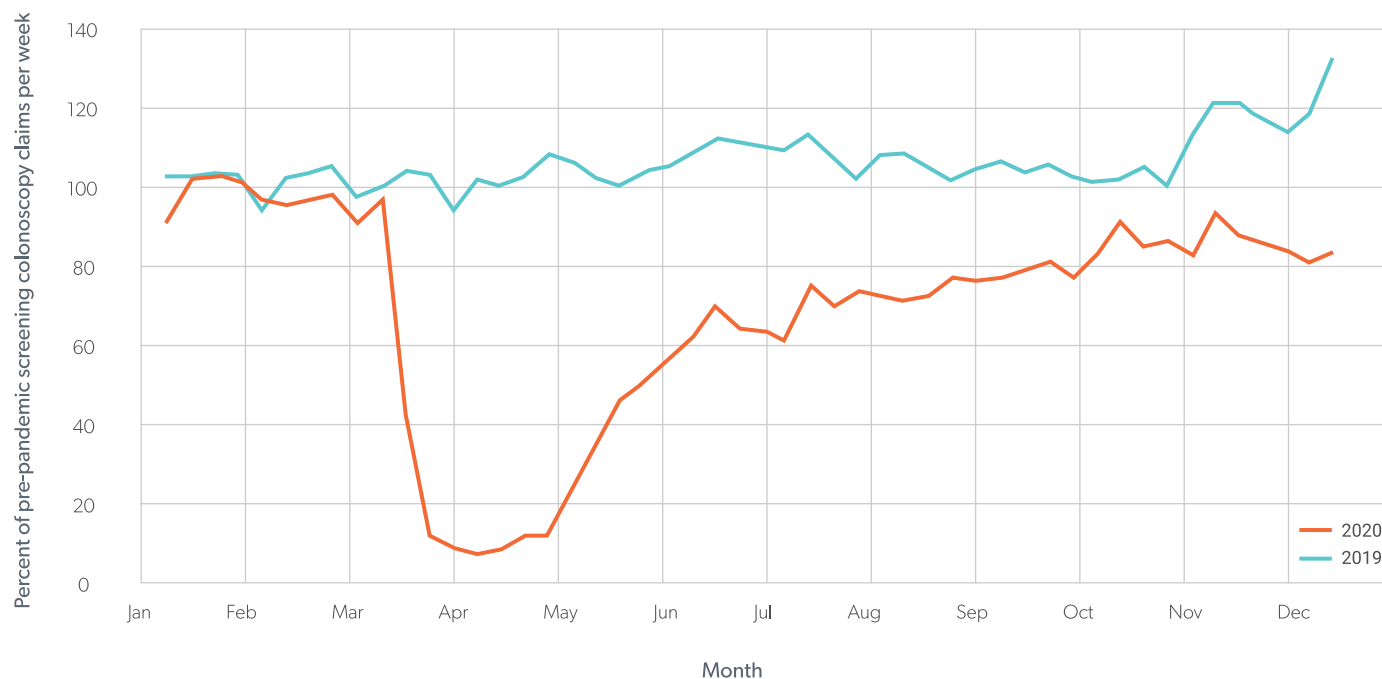
Note: Based on an analysis of 58,416,800 commercial claims, 5,391,571 Medi-Cal claims, and 18,144,104 Medicare Advantage claims across 2019 and 2020.

Declines in Preventive Services

Several national studies have found declines in preventive cancer screening in 2020, potentially leading to **delayed cancer diagnoses**. Our analysis shows the same pattern in California. The case of colon cancer screening (colonoscopy) is instructive. As shown in Chart 4, colonoscopy volumes fell almost 93% across April and May 2020, and then leveled off at about 28%

below 2019 levels. There are large numbers of people who never received recommended colonoscopies in 2020. It will be important to close the gap in screening and monitor whether colorectal cancer, as well as other cancer types, will be diagnosed at later stages in California over the next few years.

Chart 4: Screening Colonoscopy Claims Volumes in California



Note: Includes data for 93,995 claims from January 1, 2019, through December 31, 2019, and 61,589 claims from January 6, 2020, through December 14, 2020. Some claims may be missing due to lag time for the claims adjudication process. Screening colonoscopy visits are defined as claims with the following procedure codes: 45378, G0105, and G0121. Based on claims data from a query run on April 8, 2021. The data are indexed to the mean number of weekly visits in January and February 2020. In order to clearly depict the overall trend, data from weeks with holidays were excluded and replaced with the mean number of visits from the week prior to and following the week with the holiday.

Table 2 summarizes volumes for a selection of other services. Like colonoscopy, other preventive services fell sharply in 2020: 20% for mammography and 41% for cervical cancer screening. In contrast, certain procedures, such as knee arthroplasty, decreased less,

while others, such as PET scans and hip arthroplasties, were essentially flat for the year, most likely dropping in early 2020 and then rebounding strongly in the second half of the year.

Table 2: Volume of Selected Services, 2019-2020

Service	2020 Visits	% Change 2019-2020
Cervical Cancer Screening	96,289	-41%
Colonoscopy	61,589	-34%
Mammography	543,057	-20%
Knee Arthroplasty	18,134	-17%
Hip Arthroplasty	12,702	-3%
PET Scans	41,157	-2%

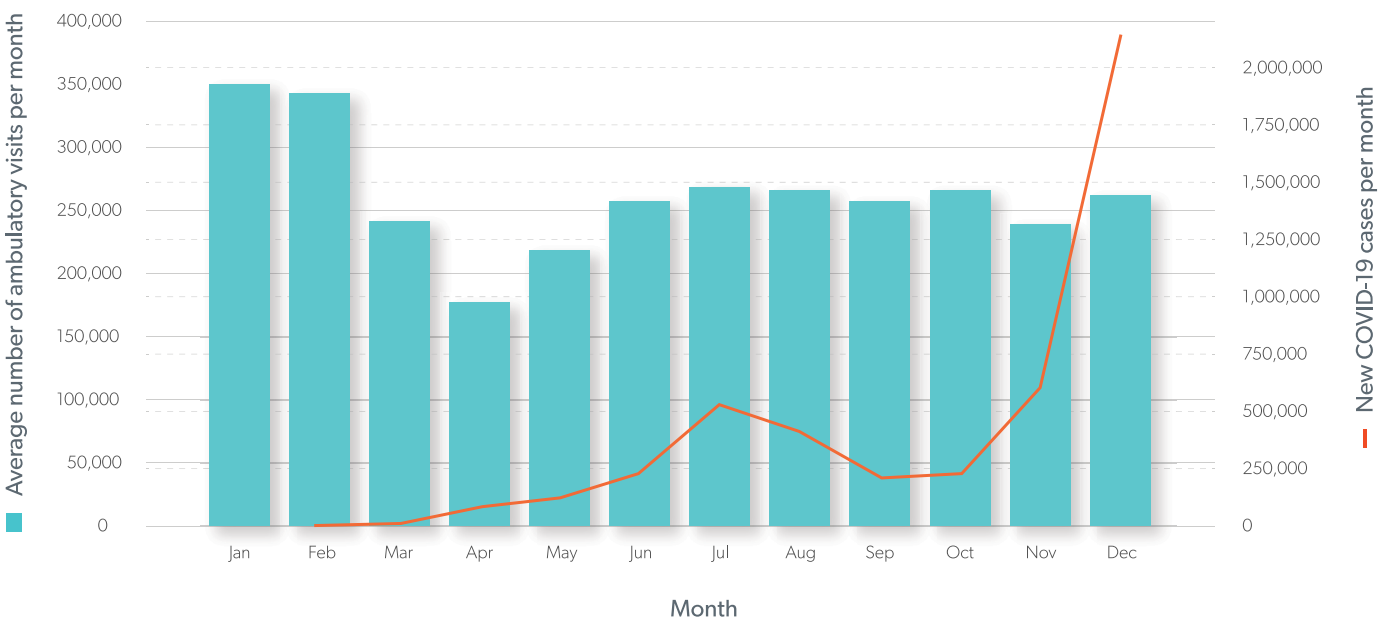
Note: Screening mammography visits are defined as claims with the following procedure codes: 77063, 77065, 77066, 77067, and G0279. Screening colonoscopy visits are defined as claims with the following procedure codes: 45378, 45389, 45380, 45383, 45385, 45386, 45388, 45390, 35491, 45392, 45393, 45398, G0105, and G0121. Cervical cancer screenings are defined as claims with the following procedure codes: 99381, 99382, 99383, 99384, 99385, 99386, 99387, and Q0091. Knee arthroplasty visits are defined as claims with the following procedure codes: 27445, 27446, 27447, 27486, and 27487. Hip arthroplasty visits are defined as claims with the following procedure codes: 27130, 27132, 27125, 27134, and 27138. PET scans are defined as claims with the following procedure codes: 78811, 78812, 78813, 78814, 78815, and 78816.

Relationship Between COVID-19 and Ambulatory Visits

The sharp reduction in health care utilization across the spring of 2020 is in part explained by the fact that there were so many unknowns surrounding COVID-19, which understandably stoked fear of patients and clinicians being exposed to the virus in medical settings. Many clinician offices were closed or performing limited services during that period. As the pandemic extended through the year, however, medical offices opened up as Californians became more accustomed to living

with COVID-19 risk and taking needed precautions. As shown in Chart 5, while visit volumes dropped sharply early in the pandemic, they remained flat as the number of new COVID-19 cases in the state surged in November and December. For example, visits fell only modestly between October and December while the number of monthly new COVID-19 cases in the state increased more than eight-fold in that period, from 225,694 to 2,134,758.

Chart 5: California Ambulatory Visit Volumes vs. New COVID-19 Cases, 2019-2020



Note: Includes data for 13,235,774 office visits and telemedicine claims from January 1, 2020, through February 28, 2021, and 6,958,156 new COVID-19 cases. Some claims may be missing due to lag time for the claims adjudication process. Query run on April 4, 2021, based on a cohort of 5.3 million. Office visits are defined as claims with the following procedure codes: 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99213, and 99215. In order to clearly depict the overall trend, data from weeks with holidays were excluded and replaced with the mean number of visits from the week prior to and following the week with the holiday.

Conclusion

Our analysis shows substantial care disruptions in 2020 during the height of the COVID-19 pandemic, including worrying reductions in care for children and in preventive cancer screenings. Without focused attention, these could have lasting negative effects on the health of Californians.

Before releasing this report, we discussed our draft findings with health leaders across the state. They offered these common-sense recommendations for how public health, health plans, policy-makers, and providers can work together to fill the gaps:

- Launch focused campaigns to increase preventive cancer screening in 2021. With so many visits occurring through telehealth, using regular office visits will not be the single answer. Preventive screenings will also need to be offered in communities, diverse clinical locations, work places, and pharmacies.
- Ensure that every child and adolescent has a wellness visit early in 2021 to monitor physical, mental, and developmental health, to counsel and support families, and to provide referrals to needed services.
- Proactively identify and reach out to high-risk patients and those who have gaps in care to ensure they receive the services they need.
- Improve the collection and quality of race and ethnicity data so that we can improve healthcare equity.

For our part, Manifest MedEx will continue to support this critical work through:

- Ongoing tracking of California healthcare trends through cohort analysis. We will monitor statewide trends and share what we learn as the health care delivery system continues to recover and evolve.
- Working with providers and health plans to improve the collection and use of race and ethnicity data, which is critical to improve healthcare equity. Race data is particularly challenging as it is often present in some patient records, but not in others, so a core task is to unify and combine data. Because MX brings together claims and clinical data from multiple sources to produce unified longitudinal records for patients, we are well positioned to help provide rapid improvement in equity insights.
- Continuing to give providers and health plans the population health insights they need to rapidly re-engage patients and address 2020 care disruptions, including tools to identify high-risk patients, flag gaps in care, track vaccination status, monitor patients recovering from COVID-19, coordinate care, and prepare for pent-up demand from patients who postponed care during the pandemic.

If you have questions or comments about this report, please contact sarita.choy@manifestmedex.org.

About Manifest MedEx

As California's largest nonprofit health data network, Manifest MedEx delivers real-time information and helps healthcare providers and health plans care for millions of patients every day.

Together, we are transforming the healthcare landscape across the state, supporting California as a leader in affordable, proactive, and compassionate medical care. For more information visit manifestmedex.org and follow us [@ManifestMedEx](https://twitter.com/ManifestMedEx).

Manifest MedEx worked with Josh Gray and Ashley Holmes to develop this report.

Josh Gray is a health care researcher. He launched and managed the Research Department at athenahealth, a cloud-based electronic health records company. He currently works with Health Data Analytics Institute, a predictive analytics startup, and consults with innovative health care companies to fulfill their missions through analytics, strategy formulation, and thought leadership.

Ashley Holmes is a data scientist currently working with nQ Medical to better understand neurodegenerative conditions by using machine learning to analyze keystroke data.

Notes on Methodology

Cohort Data

For this project, we defined two cohorts of patients. The first is a longitudinal cohort, consisting of 4 million patients with active health insurance coverage from January 1, 2019, through December 31, 2020. The second is a larger cohort, consisting of 5.3 million patients with active health insurance coverage from January 1, 2020 through December 31, 2020. The first sample includes 12% of the residents of Orange County, 13% of the residents of Los Angeles, 8% of the residents of San Francisco, 7% of the residents of San Diego, 7% of the residents of Riverside, 6% of the residents of Sacramento, and 10% of the residents of all other California counties.

A comparison of age bands and gender within the Manifest MedEx Sample compared with the state of California is presented below:

Age Group/Gender	MX Sample	California Population
Under 5	2.6%	6.0%
Under 18	15.4%	22.5%
18 - 64	60.4%	62.7%
65+	21.7%	14.8%
Female	52%	50.3%

Source: [Census.gov](https://www.census.gov).

Data

Data was from January 1, 2019 through December 31, 2020. Ambulatory visits are defined as claims with the following procedure codes: 99201, 99202, 99203,

99204, 99205, 99211, 99212, 99213, 99213, and 99215. Screening mammography visits are defined as claims with the following procedure codes: 77063, 77065, 77066, 77067, and G0279. Screening colonoscopy visits are defined as claims with the following procedure codes: 45378, 45389, 45380, 45383, 45385, 45386, 45388, 45390, 35491, 45392, 45393, 45398, G0105, and G0121. Cervical cancer screenings are defined as claims with the following procedure codes: 99381, 99382, 99383, 99384, 99385, 99386, 99387, and Q0091. Knee arthroplasty visits are defined as claims with the following procedure codes: 27445, 27446, 27447, 27486, and 27487. Hip arthroplasty visits are defined as claims with the following procedure codes: 27130, 27132, 27125, 27134, and 27138. PET scans are defined as claims with the following procedure codes: 78811, 78812, 78813, 78814, 78815, and 78816.

Limitations

Although we have a large longitudinal cohort, we cannot be sure that is fully representative of the state's population in all metrics that could be affected by COVID-19. The lack of usable data on race (a widespread problem in both California and the US as a whole) prevent us from analyzing a range of important issues around equity.

COVID-19 Data

Data on cases in the state of California retrieved from <https://data.ca.gov/dataset/covid-19-cases>.



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