

Maintaining Age Appropriate Screening and Vaccinations During the COVID-19 Pandemic

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Introduction

- COVID-19 has disrupted pediatric well child care (WCC), delaying necessary vaccinations and routine screening.
- Patient safety is critical, however delaying vaccinations and screenings threatens long-term health outcomes.
- Resurgence of measles outbreaks highlights the impact of reduced vaccination rates.
- The majority of child lead exposure occurs at home. More time at home due to quarantines may result in increased exposure to lead.
- Here we show a panel management approach supported by Electronic Medical Record (EMR) tools to evaluate our rates of lead screening and vaccinations, as well as design a outreach strategy to close deficits.

Methods

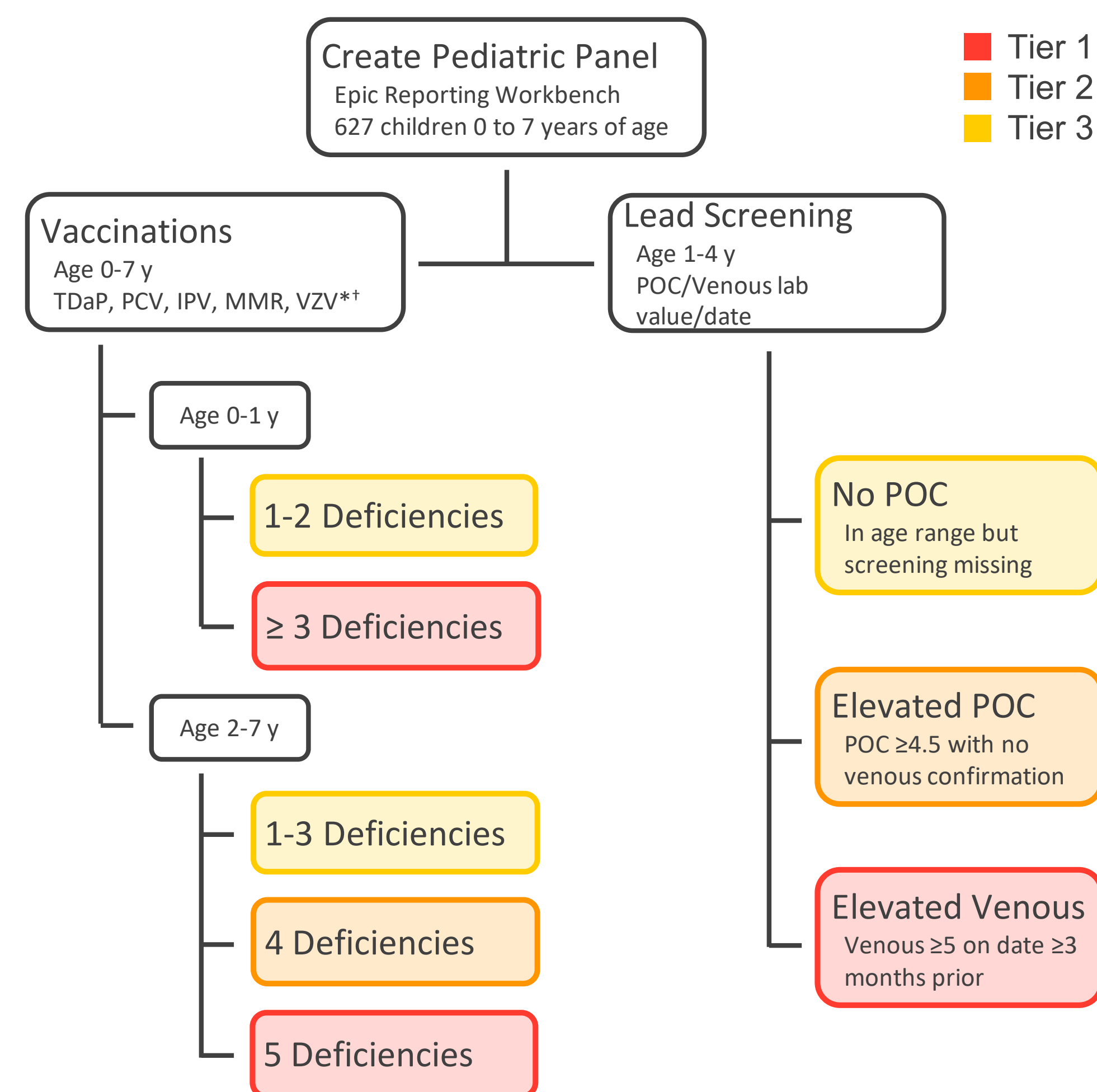
Report Generation

WCC volume data was collected using Reporting Workbench to query for visits at the Yale Internal Medicine/Pediatrics continuity practice filed under the designation of *Well Child Examination*.

Vaccination and Lead data were collected using Reporting Workbench to query the *Health Maintenance* record and POC/venous lead results for patients within the clinic.

Data Analysis and plotting were conducted in R (R version 3.5.0)

Screening Workflow



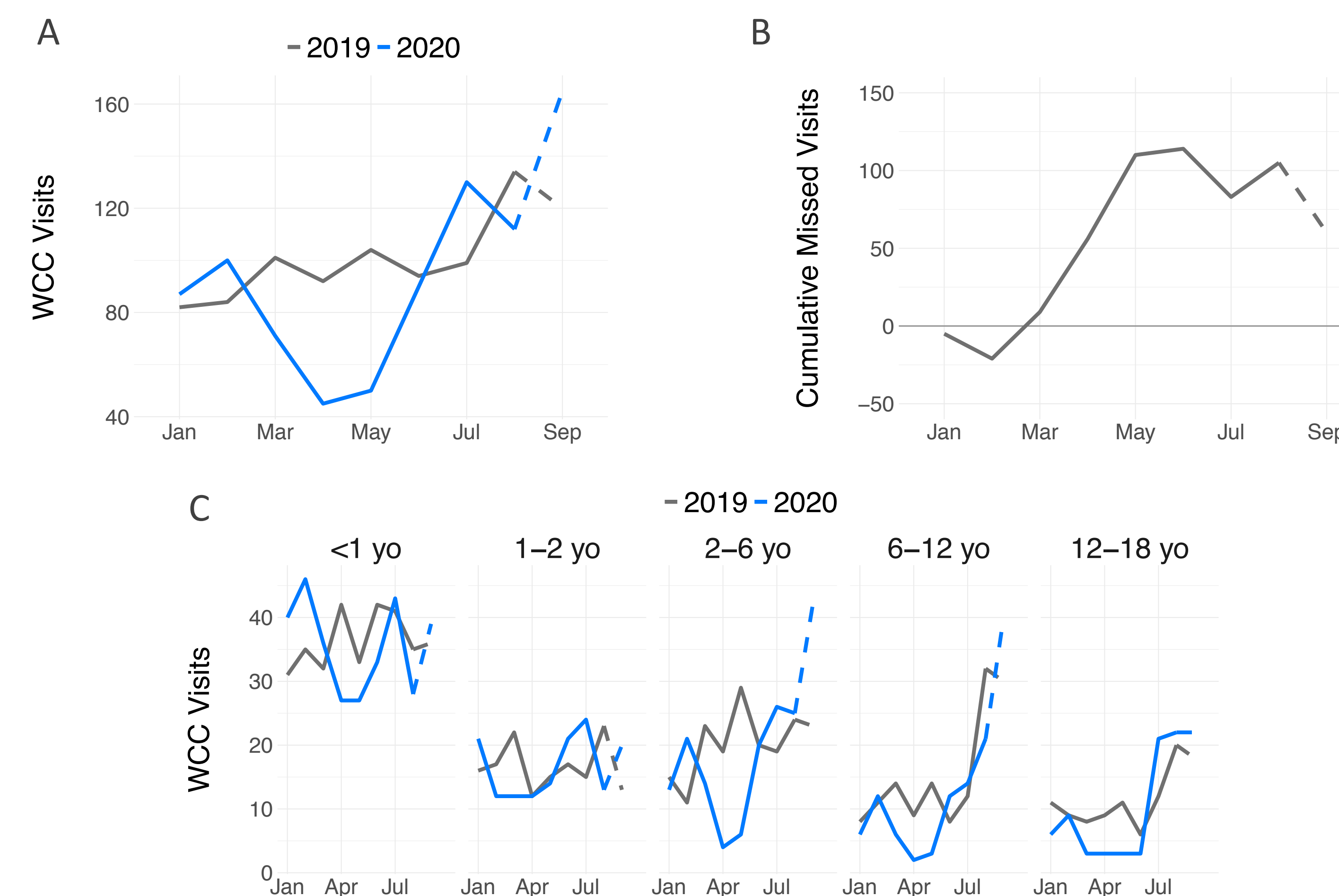
Patient Outreach

In addition to regularly scheduled WCC visits, patients part of the above designated Tiers have been prioritized for proactive outreach to schedule follow up well child visits.

* Hib deficiency not included due to its exclusion from Health Maintenance data fields, however high rates of con-administration with PCV/IPV/Tdap mean children with missing Hib vaccines are likely to be captured.
† Rotavirus not included due to similar issue in Health Maintenance data storage.

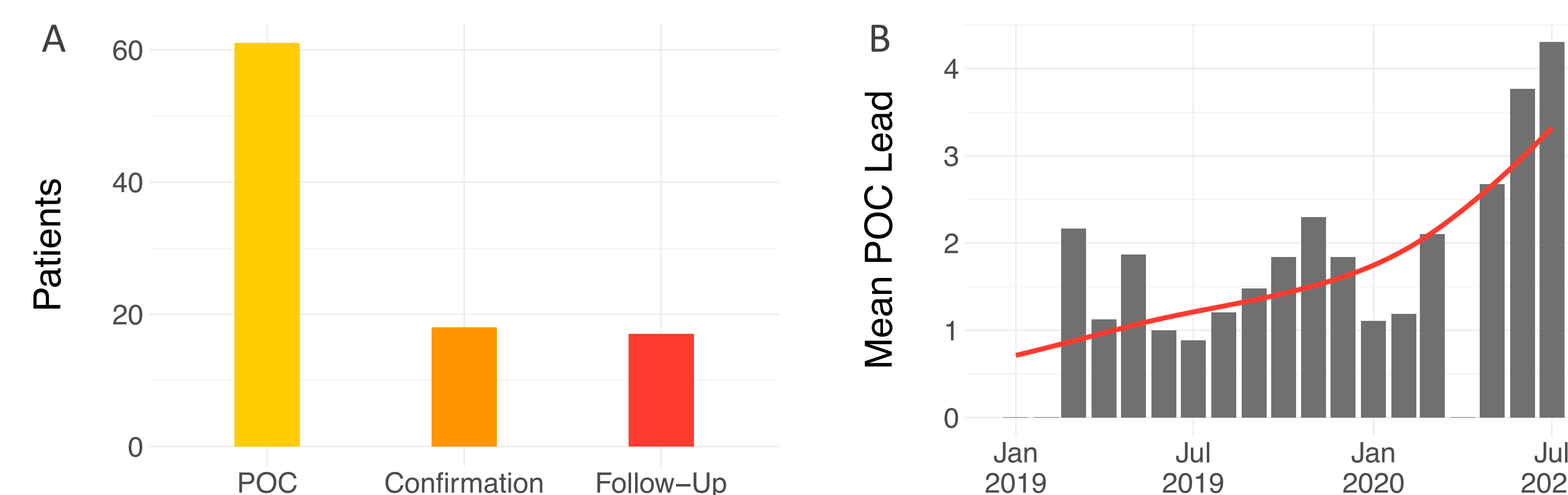
Results

COVID-19 created a deficit in WCC primarily affecting school-aged children.



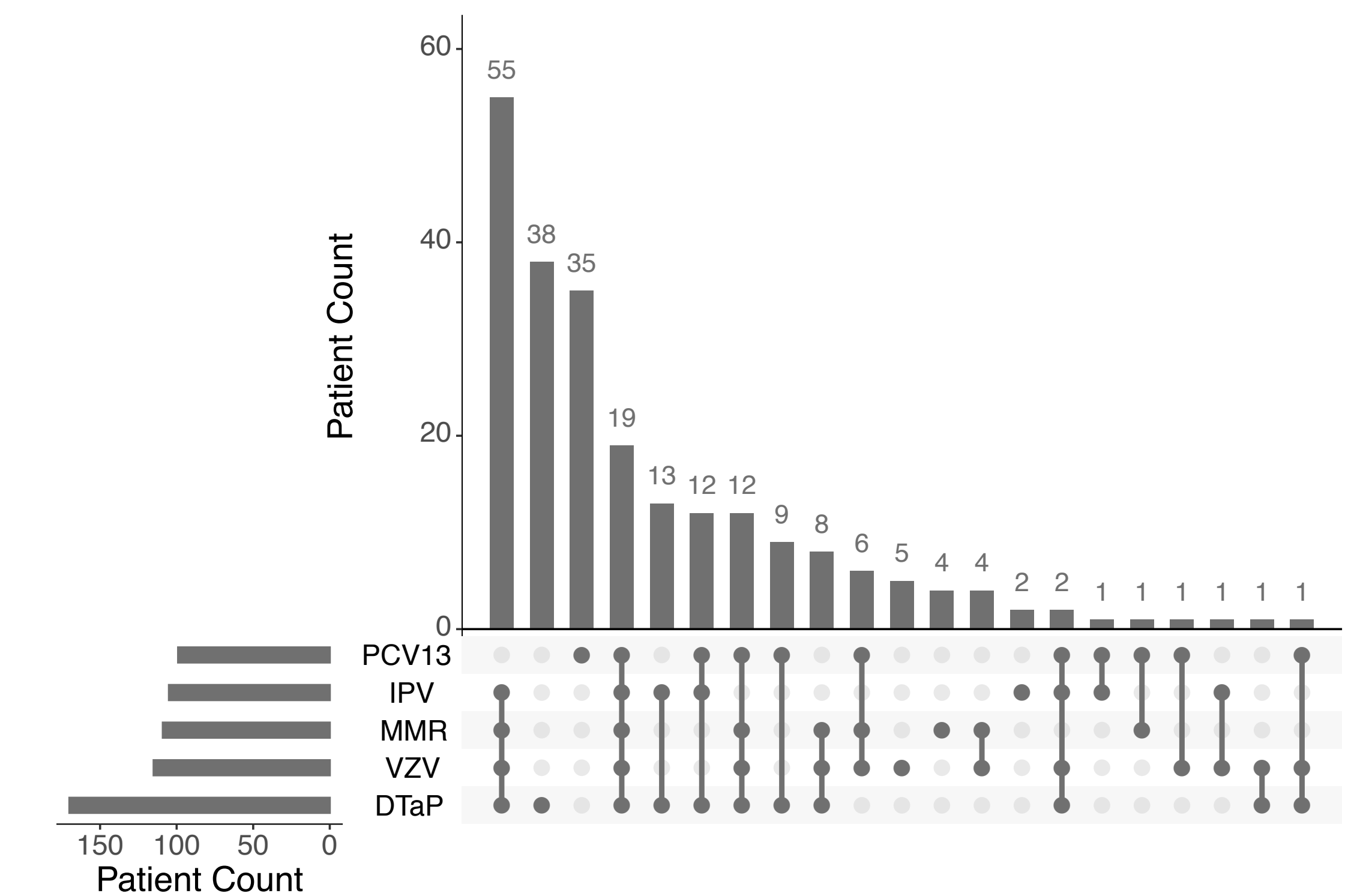
A. WCC Volume 2019 vs. 2020. There is a deficit of visits corresponding to the peak of the COVID-19 pandemic in Connecticut. Dashed lines show time-points after QI initiative began.
B. Cumulative visit deficit. By June 2020, the visit deficit exceeded 100, but has declined in subsequent months. Dashed lines show time points after the QI initiative began.
C. WCC Volume by age. Through the pandemic peak, WCC for <1 years old and 1-2 years old were relatively preserved. The majority of missed visits came from children 2-18 years of age.

Lead Screening and follow-up are needed. POC lead values appear to be trending upward since the start of COVID-19.



A. Lead Screening Status. The status of lead screening for 3 different categories was obtained. POC denotes the number of children age 1-4 who had not had a POC lead screen. Confirmation denotes the number of children who had an elevated POC screening value that requires confirmation with venous testing. Follow-Up denotes children with known venous lead levels whose last venous blood draw date was ≥ 3 months prior.
B. POC Lead Result Value Trend. Bars show the mean of last POC lead value per patient binned by month and year of sample date. Red line is a LOESS smoothed estimate of the trend. Comparing 2020 to 2019, May-July have higher mean values. This suggests that POC lead values have increased during the pandemic. While this is consistent with a mechanism of increased exposure, further work to rule out contributions from technical sources or POC tests ordered in place of venous levels for children with known lead levels is required.

EMR based Screening can be used to identify potential Vaccination deficiencies.



Pediatric Vaccination status. The above plot shows the number of patients with vaccination deficiencies aggregated for single vaccines and combinations of vaccines. Each row in the grid denotes a specific vaccine. Total deficiencies for each vaccine are summarized by the horizontal histogram on the left. The columns of the grid show combinations of vaccine deficiencies with filled markers. The vertical histogram shows the count of patients with the combination of deficiencies denoted by the column in the grid below.

Conclusions

Effect of COVID-19 on Well Child Care

COVID-19 has disrupted well child care within the Yale Internal Medicine – Pediatrics Resident clinic leading to a deficit of approximately 120 visits by June 2020.

School age children account for the majority of postponed or missed visits.

Lead and Vaccinations

Significant numbers of patients meet EMR-based criteria for lead screening and vaccinations. It is likely that COVID-19 has increased these numbers given the reduction in WCC observed, however data to directly compare is not available at this time.

Mean POC lead values have risen from May-July 2020 suggesting potential increased exposure which may occur due to increased time spent at home.

Improving Quality of Care

EMR tools can identify patients with potential deficits in age-appropriate screening or follow-up and vaccinations.

Efforts are ongoing to review charts for patients in Tier 1-3 and reach out to parents/guardians to schedule well child visits, laboratory draws, and vaccine visits as appropriate.

References

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4. Conway JR, Lex A, Gehlenborg N. UpSetR: an R package for the visualization of intersecting sets and their properties. *Bioinformatics.* 2017 Sep 15;33(18):2938-40.