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Sentinel surveillance of SARS-CoV-2 rates and equity impacts using labor and delivery patients in Phoenix, Arizona

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ABSTRACT

Proactive management of SARS-CoV-2 requires timely and complete population data to track the evolution of the virus and identify at risk populations. However, many cases are asymptomatic and are not easily discovered through traditional testing efforts. Sentinel surveillance can be used to estimate the prevalence of infections for geographical areas but requires identification of sentinels who are representative of the larger population. Our goal is to evaluate applicability of a population of labor and delivery patients for sentinel surveillance system for monitoring the prevalence of SARS-CoV-2 infection. We tested 5307 labor and delivery patients from two hospitals in Phoenix, Arizona, finding 195 SARS-CoV-2 positive. Most positive cases were associated with people who were asymptomatic (79.44%), similar to statewide rates. Our results add to the growing body of evidence that SARS-CoV-2 disproportionately impacts people of color, with Black people having the highest positive rates (5.92%). People with private medical insurance had the lowest positive rates (2.53%), while Medicaid patients had a positive rate of 5.54% and people without insurance had the highest positive rates (6.12%). With diverse people reporting for care and being tested regardless of symptoms, labor and delivery patients may serve as ideal sentinels for asymptomatic detection of SARS-CoV-2 and monitoring impacts across a wide range of social and economic classes. A more robust system for infectious disease management requires the expanded participation of additional hospitals so that the sentinels are more representative of the population at large, reflecting geographic and neighborhood level patterns of infection and risk.

1. Introduction

Effective management of SARS-CoV-2 requires access to surveillance data that are timely and complete. However, robust surveillance data are difficult to obtain as even the best surveillance programs are prone to under-reporting (Ibrahim, 2020), due to limited asymptomatic testing and variability in access to healthcare and testing programs. Beyond tracking population level positivity rates, an important use of surveillance data is to monitor equity implications of SARS-CoV-2 (Noppert and Zalla, 2021). Monitoring equity is critical for understanding disparities in the impact of SARS-CoV-2 and for identifying populations and

communities to prioritize for public health interventions such as education and accessible vaccines and testing.

Sentinel surveillance can improve SARS-CoV-2 data and monitoring efforts by enabling a higher level of asymptomatic testing and sampling a representative portion of the population. The challenge for designing a good sentinel surveillance program is identifying and accessing sentinels that make up a representative sample of the population and can be tested, regardless of symptoms and healthcare access. Early in the pandemic, urgent care facilities were used for sentinel surveillance, and these programs helped assess the community level SARS-CoV-2, but lacked data collection on asymptomatic cases (Zwald et al, 2020).

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Currently, detection of SARS-CoV-2 in wastewater has been useful in alerting officials to the presence of the virus in their neighborhoods, but faces issues due to the needed concentration of the virus, temperature degradation of the samples, and limitations to the ability of comparing demographics of individuals who are infected with SARS-CoV-2 (Hart and Halden, 2020). In contrast, airports have also been used as sentinel sites (Chang et al., 2020). While airports are ideal for capturing data on asymptomatic cases, they lack data on lower income and socio-economical diverse people needed for supporting public health and equity efforts.

A unique sentinel for surveillance of SARS-CoV-2 is people reporting for labor and delivery. Labor and delivery units serve people from all socioeconomic classes and life circumstances, and it is possible to test every person reporting for labor and delivery regardless of symptoms. Labor and delivery units have been used in HIV screening (Celentano, 2008), and have potential to serve as sentinels for ongoing monitoring of SARS-CoV-2. To prevent transmission of SARS-CoV-2 among asymptomatic patients in the hospital, universal screening on labor and delivery was initiated early on in the pandemic in two Arizona hospitals. This screening created a unique opportunity to assess the appropriateness of labor and delivery patients as a sentinel for data collection on population level infection rates and for monitoring equity impacts of SARS-CoV-2.

Our goal is to evaluate the potential of using data on people reporting for labor and delivery in developing a sentinel surveillance system for monitoring disease prevalence and variation in the social and economic impacts of SARS-CoV-2. We have partnered with two hospitals in AZ, Valleywise Medical Center, and HonorHealth Scottsdale Shea Medical Center (SSMC). Valleywise Medical Center serves predominately Latinx and uninsured/underinsured individuals, while HonorHealth SSMC serves predominately White individuals and a higher proportion of patients that are privately insured.

Using SARS-CoV-2 data from Valleywise Medical Center and HonorHealth SSMC labor and delivery departments we quantified how SARS-CoV-2 positivity rates among people admitted for labor and delivery have varied over time and compared trends to those observed in statewide positivity rates in Arizona. Additionally, we analyzed how positivity rates vary with race and ethnicity as well as by insurance type, as a measure of healthcare access for patients. In this pilot study we aim to

demonstrate a method of surveillance that could be scaled to a larger number of hospitals and patients. With a larger number of participants in a surveillance program it would be possible to conduct spatially explicit surveillance and confirmatory findings, yet here we focus on proof of concept and generating hypotheses.

1.1. Data and study area

Patients reporting for labor and delivery for two different medical sites in Arizona: Valleywise Medical Center and HonorHealth SSMC were tested for SARS-CoV-2. Valleywise Medical Center is a public teaching medical center, and as such focuses on the care of underserved populations in Phoenix, Arizona. Valleywise Medical Center delivers 2000 babies per year and is a Level III High Risk L&D and NICU. HonorHealth SSMC delivers 5500–6000 babies per year and is a Level III High Risk L&D and NICU. 72.6 % of patients have some college or a college degree. For Valleywise Medical Center, the dataset included patients from May 2020 to March 2021 (Fig. 1). For HonorHealth SSMC, the dataset included patients from April 2020 to February 2021 (Fig. 1). There is a difference regarding contagiousness and symptom severity for different SARS-CoV-2 variants. We were looking at the earliest variants during the time period of April 2020 to March 2021 which was before the later Delta and Omicron surges.

The racial and/or ethnic breakdown of the patients included in this

Table 1
Race and ethnicity of patients at Valleywise Medical Center and HonorHealth SSMC.

Race and or ethnicity	Valleywise total patients N (%)	HonorHealth total patients N (%)
American Indian or Alaska Native	33 (2.4 %)	37 (0.9 %)
Asian, Native Hawaiian, or Other Pacific Islander	40 (3.0 %)	310 (7.8 %)
Black or African American	199 (14.7 %)	139 (3.5 %)
Hispanic or Latinx	945 (69.8 %)	568 (14.4 %)
Other	16 (1.2 %)	61 (1.5 %)
White or Caucasian	121 (8.9 %)	2838 (71.8 %)
Total	1354	3953

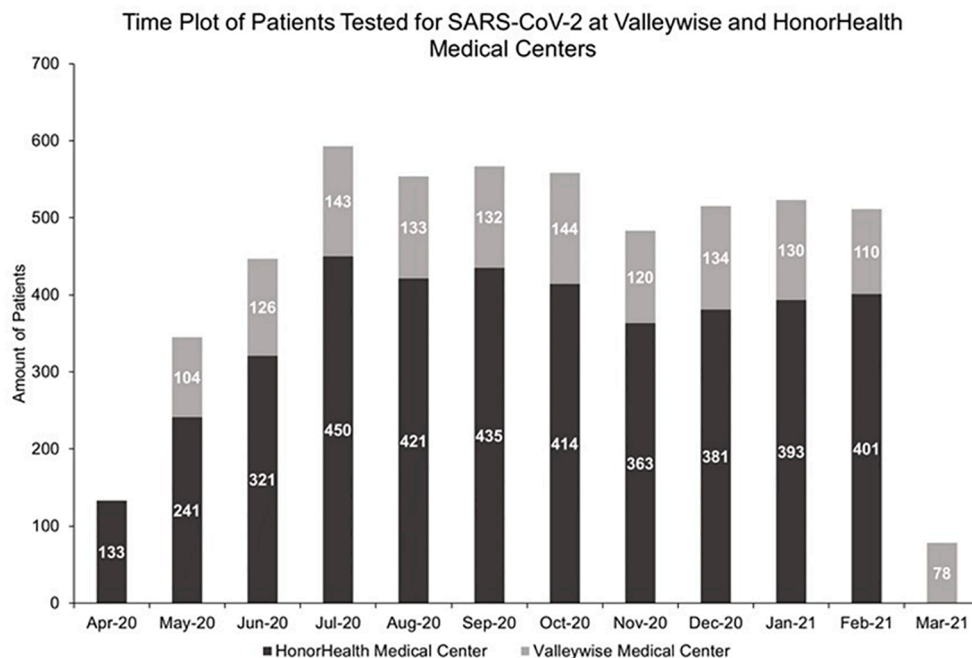


Fig. 1. Bar Plot of the number of patients tested for SARS-CoV-2 at HonorHealth SSMC and Valleywise Medical Center from April 2020 to March 2021.

study is seen in [Table 1](#). Inclusion criteria for patients included those admitted for labor, and then delivered on that admission. SARS-CoV-2 was detected with the Cepheid Xpert Xpress SARS-CoV2 polymerase chain assay (RT-PCR assay), collected using a nasal swab, and sent to the lab for processing at both centers. All patients admitted to the labor and delivery (L & D) unit were tested unless they had a prior positive test in the last 90 days. The data set was all patients who delivered, which represents a population sample of people undergoing delivery. A few patients were tested after delivery due to rapid delivery but only those with results within 5 days of delivery were included. A total of 3953 patients from HonorHealth SSMC and 1354 patients from Valleywise Medical Center were included.

Exclusion criteria were patients admitted but not delivered, screened without admission, with a prior positive test for SARS-CoV-2 within the U.S. Centers for Disease Control reference range of 90 days. The decision to exclude patients admitted but not delivered was related to 1) the limited availability of testing material and 2) many patients in the OB triage were there for non-SARS-CoV-2 related issues and were discharged undelivered. For the HonorHealth SSMC, we excluded records for March 2021 due to not having a complete dataset. We also removed records of patients who refused to be tested for SARS-CoV-2 at HonorHealth SMCC. If patients at HonorHealth SMCC refused testing, it was presumed that they were positive for SARS-CoV-2. Few patients refused (50 out of approximately 4500 records). Reasons were not documented, but staff recalled that many patients were afraid of the test or were not believers of SARS-CoV-2. For both centers, we removed the records of patients who did not reside in Arizona.

From our data we calculated positivity rates, defined as the total number of cases in a population divided by the total population, of SARS-CoV-2 through time, by racial and/or ethnic group, and by insurance type. For comparison of positivity rates between people admitted for delivery and the general population of Arizona, we used daily data on infections from Arizona Department of Health Services SARS-CoV-2 dashboard (<https://www.azdhs.gov/covid19/data/index.php>).

For HonorHealth SSMC we also had data that indicated if the patients testing positive were symptomatic. At HonorHealth SMCC, symptom data was collected by a patient survey done on paper. Only 20.66 % (25/121) of patients testing positive were symptomatic.

2. Methods

This study was approved by the IRB committee at Valleywise Health Medical Center, #2020-097 and HonorHealth SSMC #1673686-1.

We calculated the positivity rates of patients who tested positive for SARS-CoV-2 as the total number of cases in a population divided by the total population.

To compare the positivity rates through time we partitioned the records of both medical centers by month and calculated positivity rates from April 2020 to March 2021. We also calculated a combined positivity rate for both centers.

We then calculated the rates of positive SARS-CoV-2 patients per racial and/or ethnic group for both centers using the following racial and/or ethnic classifications: American Indian or Alaska Native, Asian or Native Hawaiian or Other Pacific Islander, Black or African American, Hispanic or Latinx, Other, and White or Caucasian.

We used rate ratios to compare positivity rates between an individual racial and/or ethnic group and a reference group (reference group for this study: White or Caucasian).

Temporal trends at different peaks in positive SARS-CoV-2 rates for racial and/or ethnic groups were assessed using a Fisher's Exact Test. We combined the positive cases for both centers and defined the first peak as May to August of 2020 and the second peak as October 2020 to February 2021. If a significant association was found through a significant *p*-value between the demographic variable of interest and the positive SARS-CoV-2 number of patients a post hoc test of a Row-Wise

Fisher's Exact Test was used to determine which racial and/or ethnic group had a significant association with testing positive for SARS-CoV-2.

We also calculated the rates of positive SARS-CoV-2 patients by insurance type for only HonorHealth SSMC (due to data availability). We categorized insurance types into four general categories: Medicaid, Self-Pay, Private Insurance, and Other. Medicaid Insurance included Medicaid and the Arizona Health Care Cost Containment System (AHCCCS) which is Arizona's Medicaid agency that provides access to healthcare for low-income people. Using the same method as outlined above for testing for a significant association between racial and/or ethnic groups during the different peaks by using a Fisher's Exact test, we tested for a significant association between the four insurance types and testing positive for SARS-CoV-2. If a significant association was found a post hoc test of a Row-wise Fisher's Exact test was used.

3. Results

In [Fig. 2](#) we show SARS-CoV-2 positivity rates from April 2020 through March 2021 for labor and delivery patients and all Arizonians. Despite the relatively small number of positive cases in the labor and delivery patients (195/5307), there are similarities in the trend in positivity rates through time. Relative to the Arizona statewide data, peaks in the labor and delivery patients were smaller and about a month later.

In [Fig. 3](#), we show temporal trends in SARS-CoV-2 positivity rates for Valleywise Medical Center and HonorHealth SSMC separately and compare these to the rates in all of Arizona through time. We find early and late peaks in Arizona data correspond with different hospital populations. The June 2020 peak in Arizona positivity rates is similar to the positivity rates observed in labor and delivery patients at Valleywise Medical Center, who are predominately Hispanic, Latinx, and people of color. The December peak in Arizona positivity is similar to the positivity rates observed in labor and delivery patients at HonorHealth SSMC, who are predominately white.

Differences in the SARS-CoV-2 positivity rates by race are shown in [Table 2](#). Overall, 3.67 % of patients tested positive. The percentage of people testing positive was highest for Black patients (5.92 %) followed by American Indian and Alaska Native patients (5.71 %), and Hispanic or Latinx patients (4.56 %). White (3.08 %) and Asian (2.29 %) patients had the lowest percentage of people testing positive for SARS-CoV-2.

In order to compare the rates among the different racial/ethnic groups, we computed SARS-CoV-2 rate ratios between the different groups using the White or Caucasian population as the reference group. The results of this rate ratio analysis are shown in [Table 3](#) for each medical center and both populations combined.

As seen in [Table 3](#), for Valleywise Medical Center, American Indian or Alaska Native patients were 2.20 [95 % CI: 0.53, 9.21] times more likely to have SARS-CoV-2 than White or Caucasian patients. All racial or ethnic groups (except Asian, Native Hawaiian, or Other Pacific Islander where $N_{positive} = 0$) had a rate ratio larger than 1, indicating that they had a higher chance of having SARS-CoV-2 in comparison to the White or Caucasian population when coming to Valleywise Medical Center to give birth.

As seen in [Table 3](#), for HonorHealth SSMC, Hispanic or Latinx patients were 1.16 [95 % CI: 0.71, 1.89] times more likely to have SARS-CoV-2 than White or Caucasian patients. Patients who identified as Other also had a positive rate ratio of 1.08 [95 % CI: 0.27, 4.40]. Conversely, all other racial or ethnic groups had a rate ratio less than 1, indicating that they had a lower chance of having SARS-CoV-2 compared to the White or Caucasian population when coming to HonorHealth SSMC to give birth.

As seen in [Table 3](#), for both medical centers, Black or African American patients were 1.92 [95 % CI: 1.19, 3.12] times more likely to have SARS-CoV-2 than White or Caucasian patients. All racial or ethnic groups (except Asian, Native Hawaiian, or Other Pacific Islander where the rate ratio = 0.74 [0.36, 1.53]) had a rate ratio larger than 1, indicating they had a higher change of having SARS-CoV-2 in comparison to

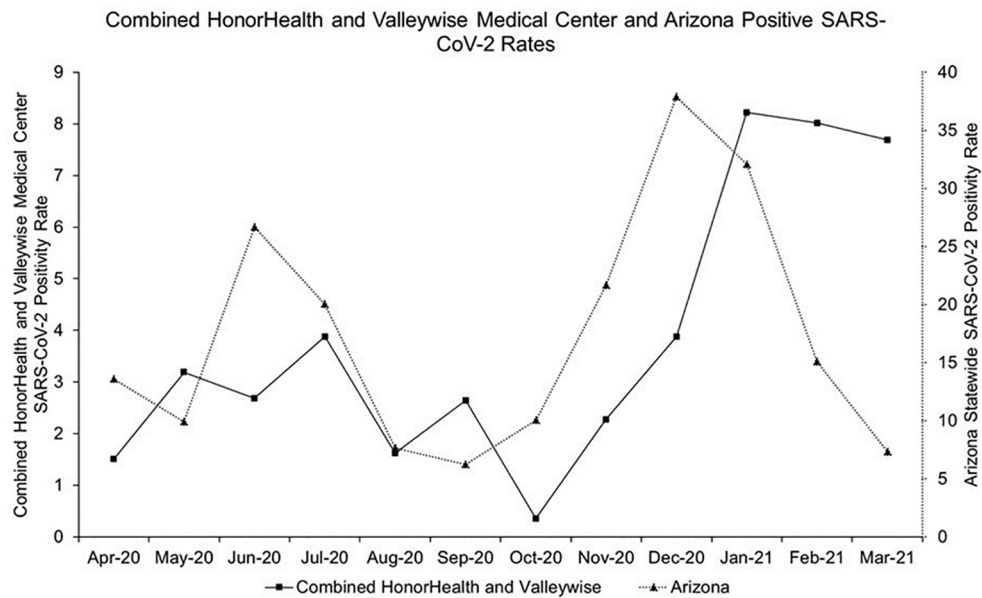


Fig. 2. SARS-CoV-2 positivity rates from April 2020 to March 2021 for the combined cases of HonorHealth SSMC and Valleywise Medical Center and Arizona.

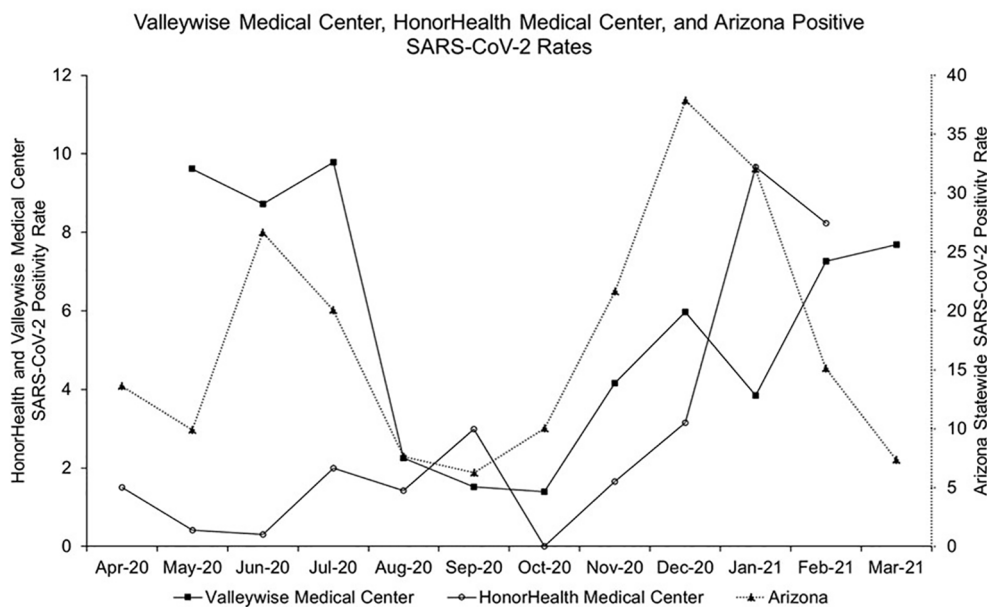


Fig. 3. SARS-CoV-2 positivity rates from April 2020 to March 2021 for Honor Health Medical center, Valleywise Medical Center, and Arizona.

the White or Caucasian population.

Results of the Fisher's Exact Tests show variation in the associations of testing positive for SARS-CoV-2 among the different racial and/or ethnic groups during the different peaks (Fig. 2). For the first peak (May to August of 2020), we obtained a significant p -value of 0.000008013. A post-hoc row-wise Fisher's Exact Test (Table 4), show that the racial and/or ethnic groups of Black or African American, Hispanic or Latinx, and White or Caucasian have a significant p -value indicating a significant association between patients who tested positive for SARS-CoV-2 and those who identified as Black or African American, Hispanic or Latinx, and White or Caucasian. From the Fisher's Exact Test for the second peak (Table 5), we obtained a p -value of 0.7299 suggesting that there is no significant association between any one racial and/or ethnic group and testing positive for SARS-CoV-2 during the second peak.

In Table 6 we show the result of SARS-CoV-2 positivity rate by insurance type, for HonorHealth SSMC, which has available data on

insurance. We found that percentage of positive cases varied by type of healthcare insurance. Positivity rates were lowest among people with private medical insurance (2.53%), higher among people with Medicaid (5.57%), and the highest among people who self-pay (6.12%). Self-pay patients tend to be uninsured but do not qualify for Medicaid. In some cases, these are also people that are undocumented, though that is not typically the population served by HonorHealth SSMC.

Fisher's Exact Test results show an association between insurance type and testing positive for SARS-CoV-2 (p -value of 0.0007957) (Table 6). A post-hoc row-wise Fisher's Exact Test (Table 7) show that both private insurance and Medicaid insurance have a significant p -value, indicating significant and positive association between patients who had either Medicaid or Private insurance and testing positive for SARS-CoV-2.

Table 2
SARS-CoV-2 positivity rate by race and/or ethnicity among patients at Valleywise Medical Center and HonorHealth SSMC.

Race and/or Ethnicity	Valleywise positive SARS-CoV-2 Rate N (%)	HonorHealth positive SARS-CoV-2 Rate N (%)	Combined HonorHealth and Valleywise SARS-CoV-2 Rate N (%)
American Indian or Alaska Native	3 (9.09 %)	1 (2.70 %)	4 (5.71 %)
Asian, Native Hawaiian, or Other Pacific Islander	0 (0.00 %)	8 (2.58 %)	8 (2.29 %)
Black or African American	16 (8.04 %)	4 (2.88 %)	20 (5.92 %)
Hispanic or Latinx	49 (5.19 %)	20 (3.52 %)	69 (4.56 %)
Other	1 (6.25 %)	2 (3.28 %)	3 (3.90 %)
White or Caucasian	5 (4.13 %)	86 (3.03 %)	91 (3.08 %)
Total	74 (5.47 %)	121 (3.06 %)	195 (3.67 %)

Table 3
SARS-CoV-2 positivity rate ratio by race and/or ethnicity among patients at Valleywise Medical Center and HonorHealth SSMC (reference population = White or Caucasian).

Race and/or ethnicity	Valleywise rate ratio [95 % CI]	HonorHealth rate ratio [95 % CI]	Combined rate ratio [95 % CI]
American Indian or Alaska Native	2.20 [0.53, 9.21]	0.89 [0.12, 6.40]	1.85 [0.68, 5.06]
Asian, Native Hawaiian, or Other Pacific Islander	NA	0.85 [0.41, 1.76]	0.74 [0.36, 1.53]
Black or African American	1.95 [0.71, 5.31]	0.95 [0.35, 2.59]	1.92 [1.19, 3.12]
Hispanic or Latinx	1.25 [0.50, 3.15]	1.16 [0.71, 1.89]	1.48 [1.08, 2.03]
Other	1.51 [0.18, 12.95]	1.08 [0.27, 4.40]	1.27 [0.40, 4.00]
White or Caucasian	ref	ref	ref

Table 4
Row-wise Fisher’s Exact test for positive SARS-CoV-2 cases by race and/or ethnicity among patients at Valleywise Medical Center and HonorHealth SSMC during the first peak (May-August 2020).

Race and/or ethnicity	Positive cases	Total cases	p	p significance
American Indian or Alaska Native	0	18	1	Not Significant
Asian, Native Hawaiian, or Other Pacific Islander	2	141	0.429	Not Significant
Black or African American	10	126	0.00223	Significant
Hispanic or Latinx	29	556	0.000199	Significant
Other	0	32	1	Not Significant
White or Caucasian	14	1066	1.17E-05	Significant

4. Discussion

Sentinel surveillance can be a useful approach to collecting data on populations, but the right sentinels can be difficult to identify (Colman et al., 2019), especially for diseases like SARS-CoV-2 which spread asymptomatically and impact all people (Gao et al., 2021). People reporting for labor and delivery are a diverse sample and it is possible to test all people regardless of symptoms. While it might not be appropriate to require additional tests from people in labor, management of the pandemic has required that all people in hospitals be tested for SARS-

Table 5
Fisher’s Exact test for positive SARS-CoV-2 cases by race and/or ethnicity among patients at Valleywise Medical Center and HonorHealth SSMC during the second peak (October 2020 - February 2021).

Race and or ethnicity	Positive cases	Total cases
American Indian or Alaska Native	2	41
Asian, Native Hawaiian, or Other Pacific Islander	5	180
Black or African American	10	168
Hispanic or Latinx	31	712
Other	2	35
White or Caucasian	67	1454

Fisher’s Exact Test for Count Data: p-Value = 0.7299

Table 6
SARS-CoV-2 positivity rate by insurance type at HonorHealth SSMC (April 2020-February 2021). Note – insurance data are not available for Valleywise Medical Center.

Insurance type	Honor health positive cases	Honor health total cases	HonorHealth positive SARS-CoV-2 rate (%)
Medicaid	36	650	5.54
Other	0	17	0.00
Private	82	3237	2.53
Insurance Self-Pay	3	49	6.12

Fisher’s Exact Test for Count Data: P-Value = 0.0007957

Table 7
Row-wise Fisher’s exact test for positive SARS-CoV-2 cases by insurance type for HonorHealth SSMC.

Insurance Type	p	p. significance
Private Insurance	0.000159	Significant
Medicaid	0.00024	Significant
Other	1	Not Significant
Self-pay	0.188	Not Significant

CoV-2 and, as a by-product, healthcare data are being generated and can be repurposed for sentinel surveillance of both rates of infection and equity impacts of the diseases and its management.

An interesting aspect of this research is that when labor and delivery patients from multiple hospitals are included in sentinel surveillance it is possible to describe how different populations are impacted by SARS-CoV-2 and how they change through time. While we are not able to determine causality from this study, early peak (June 2020) in SARS-CoV-2 from Valleywise Medical Center, a hospital that serves the underinsured and primarily has patients that are people of color, compared with the later peak (Dec 2020) in patients from HonorHealth SSMC, is notable. In exploring the reasons for these trends, several of the authors were working directly with patients during these time periods which gives us some insight to hypothesize. In the early pandemic, lower income people and people whose primary language was not English had more difficulty obtaining accommodations that reduced risk, such as working from home and social distancing. In fact, some of the early cases at Valleywise Medical Center were associated with refugee people living in high density housing situations. In December 2020, HonorHealth SSMC hospital staff indicated that increased infections were associated with holiday season activities, including baby showers, where people were being impacted based on choosing to participate in activities, rather than due to lack of information or an inability to find accommodation. Regardless of why, which is anecdotal at this stage, our data highlights that different populations were impacted at different times and likely through the result of different processes and circumstances. Broadly, the trends in SARS-CoV-2 for Arizona are observed in the labor and delivery patients, though the timing and strengths of peaks did vary. While the SARS-CoV-2 peaks in the sentinel data occurred later than in

the total population, this could be the result of the relatively small sample size. Only two hospitals were included in the study leaving room for the resolution and patterns in data to improve if data were aggregated from more hospitals.

Our analysis adds to the growing body of evidence that SARS-CoV-2 has disproportionately impacted communities of color that are already underserved by healthcare (Lin et al., 2022). In our study Black and Hispanic/Latinx had the highest percentages of SARS-CoV-2 positive results. Systemic healthcare disparities for communities of color have been well documented for a wide variety of diseases (Grief and Miller, 2017, AuYoung et al., 2019). A 2020 study of all pregnant individuals who were hospitalized due to SARS-CoV-2 in the United Kingdom found that they were more likely to be overweight, be of Black, Asian, or another minority ethnic group, and to have a comorbidity (Vousden et al., 2021). While we document racial disparity in healthcare, it is critical that we find ways to increase service to communities most in need. A SARS-CoV-2 labor and delivery sentinel surveillance system, that includes data from many hospitals, could help identify neighborhoods needing public health efforts in real time. For example, data could be mapped in real time to identify new infection hot spots and public health efforts, linguistically and culturally attuned to the needs of the neighborhood, could be deployed to underserved communities.

Our results showed that people without private insurance were more likely to be SARS-CoV-2 positive. Studies have shown that there is an increased risk of cancer/chronic disease mortality for individuals with public insurance or no insurance when compared to individuals with private insurance (Bittoni et al., 2015). There is strong evidence that insurance greatly benefits health outcomes for individuals for a range of both acute and chronic illnesses such as acute respiratory conditions when compared to uninsured individuals (McWilliams, 2009). Furthermore individuals with a lack of health insurance, are less likely to receive the preventive health services that would allow for early detection of diseases which would reduce avoidable morbidity and premature death (Institute of Medicine (US) Committee on Health Insurance Status and Its Consequences, 2009). The self-pay people were a small sample, but had the highest total positivity rate, which may indicate that Medicaid is having a positive impact, but needs to include more people and services.

The results of this study must be interpreted with a few limitations in mind. The first, is that people reporting for labor and delivery are not representative of the entire population. They make up a subset of the population, therefore this may limit their ability to serve as sentinels. However, people reporting for labor and delivery who tested positive for SARS-CoV-2 were largely asymptomatic in our study. Since the later variants had higher asymptomatic rates, this reinforces the value of people reporting for labor and delivery serving as sentinels. The second limitation is the lack of information about vaccines incorporated into our results. However, as our study ended just after the introduction of the vaccine, the impact of this is likely to be limited. Given the small size of the sample used in this study results are best presented as exploratory or hypothesis generating. However, our study shows the ability of labor and delivery patients to serve as sentinels and with the inclusion of more hospitals the results will become more robust. The final limitation is the lack of accounting for confounding variables as certain factors make an individual more susceptible to being infected with SARS-CoV-2. Due to a lack of data availability and a small sample size this was not possible. However, as this is a pilot study, in future studies this analysis can be expanded and accounting for confounding factors can be included.

5. Conclusion

Our pilot study demonstrates that labor and delivery patients are an ideal sentinel for ongoing surveillance and management of SARS-CoV-2 and other novel infectious diseases. Perhaps the most valuable aspect of labor and delivery SARS-CoV-2 positivity data is the ability to monitor who is impacted by the virus. The ability to collect data from people that

have social, economic, and cultural diversity provides important data for understanding who is infected. As this is a pilot study, if scaled to more patients, this data can provide further clarity of who is being disproportionately affected by an infectious disease. The prevalence of asymptomatic positive cases suggests that, if scaled to include more hospitals, labor and delivery data could provide effective and early detection of population level positivity rates.

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CRedit authorship contribution statement

Caitlyn J. Linehan: Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Visualization. **Trisalyn Nelson:** Conceptualization, Writing – original draft, Writing – review & editing, Supervision, Project administration, Funding acquisition. **Celeste V. Bailey:** Conceptualization, Writing – review & editing. **Esma Gel:** Conceptualization, Writing – review & editing. **Dean V. Coonrod:** Conceptualization, Writing – review & editing, Funding acquisition. **Cheryl K. Roth:** Conceptualization, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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