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# School-Based Health Center Utilization During COVID-19 Pandemic-Related School Closures

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## ABSTRACT

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**BACKGROUND:** Little is known regarding utilization of school-based health centers (SBHCs) during prolonged school closures, such as those that occurred during the COVID-19 pandemic. We sought to compare SBHC utilization before and after pandemic-related school closures across a network of SBHCs affiliated with a large Southern Californian urban school district.

**METHODS:** We conducted a secondary analysis of encounter data extracted from electronic health records from 12 SBHCs that remained open despite school closures, including patient demographics and diagnostic and billing codes. We used the Clinical Classifications Software Refined to group encounters for common primary care conditions. Utilization before and during pandemic-related school closures was compared using logistic regression with cluster-robust standard errors to account for clustering within clinics, after adjusting for month of encounter.

**RESULTS:** During the pandemic, study SBHCs conducted 52,530 encounters and maintained ~4040 encounters/month. The frequency of encounters for annual preventative health exams increased for school-aged patients but decreased for other age groups while the frequency of encounters for mental health problems increased for all age groups.

**IMPLICATIONS FOR SCHOOL HEALTH POLICY, PRACTICE, AND EQUITY:** Despite pandemic-related school closures, SBHCs appear to play a critical role in providing primary care to vulnerable communities.

**CONCLUSIONS:** SBHCs may hold value beyond their co-location with academic instruction.

**Keywords:** school-based health centers; utilization; mental health; primary care; COVID-19 pandemic.

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The COVID-19 pandemic and related school closures have profoundly impacted under-resourced communities and led to many disruptions in school-based services<sup>1-4</sup> that are critical for children's health and academic success. School-based health centers (SBHCs) provide health care on a school campus, resulting in unique opportunities and challenges for serving communities during school closures. Health care services provided by SBHCs may include primary

care, dental care, mental health care, social services, and health education.<sup>5</sup> SBHCs are frequently operated in partnership with local community health providers and Federally Qualified Health Centers (FQHCs), and placed in under-resourced areas with limited access to health care.<sup>6</sup>

SBHCs have grown in number over the past 2 decades. In 1998, there were 1135 SBHCs and the most current triennial census by the School-Based

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Health Alliance identified 2584 SBHCs in 48 states, District of Columbia and Puerto Rico. The growth of SBHCs has been largely attributed to the convenience of being co-located on school campuses, making it easier for students and families to access care, being trusted providers for teen services, and being sensitive to issues of health equity.<sup>8-10</sup> Studies show student and parent health are both associated with success in school.<sup>11</sup> Growing evidence also suggests SBHCs can close gaps in student health and school performance for students from marginalized backgrounds and communities.<sup>10</sup>

Large changes in health care utilization were observed across sources of care with the changing health needs of students and families during the COVID-19 pandemic. Research suggests that there was an avoidance of health care during the beginning of the pandemic to avoid exposure as well as an increase in telehealth services.<sup>11</sup> Similar patterns were noted by SBHC staff.<sup>12</sup> In addition, most SBHCs were forced to discontinue regular in-person services due to limited access to the school site,<sup>3</sup> though some remained open and operating.

Although the studies discussed above characterize the perspectives of SBHC providers during the pandemic-related school closures, there are no known studies describing how SBHCs utilization and service data actually changed for centers that did remain open and accessible. Little is known about how patients utilize SBHCs that remain open when school is closed, or when other parts of the health care system are strained. This information can provide critical insights into the role SBHCs play in the larger health care ecosystem. For example, if SBHC utilization is largely driven by their convenient placement, we would expect a drop in utilization when school campuses are closed and families are not coming to the clinic location as part of their daily routines. Conversely, if SBHC utilization is driven by their reputation as a trusted source for care, we would expect utilization to be maintained or even increased, during a time of heightened anxiety regarding health and health care. Hence, the COVID-related school closures offer an important opportunity to study how SBHC utilization changes when schools are closed for prolonged periods, and disadvantaged communities are grappling with multiple threats to health and education.

To fill this knowledge gap, we focus on a network of 12 SBHCs affiliated with a large, urban school district in Los Angeles, that remained open during the COVID-19 pandemic-related school closures. We compared electronic health record data from these SBHCs before and after pandemic-related school closures to describe how the patient characteristics and services changed.

## METHODS

### Participants

Starting in 2015, The LA Trust for Children's Health and the Los Angeles school district worked with FQHCs across Los Angeles to establish full-scope SBHCs on 16 school campuses. They have since expanded to 19 sites. The sites were envisioned as medical homes for students, their families, and surrounding communities. The District serves over 400,000 students, with more than 85% of whom are socioeconomically disadvantaged, and over 90% of students whom identify as black, Indigenous, or People of Color (BIPOC).<sup>13</sup> They are located on the edge of school campuses with separate school facing and community-facing entrances so that they remain accessible even when school campuses are closed. In addition, sites were prioritized for the highest need students and surrounding communities as determined by mapping public health, demographic, and academic data.

### Procedure

We conducted a secondary analysis of de-identified encounter data extracted from SBHC electronic health records. The LA Trust for Children's Health collects SBHC performance metrics using encounter-level data from electronic health records. Data elements include clinic location, date of service, age at the time of the visit, diagnosis codes, services provided, patient gender, and race/ethnicity. All personally identifying information is removed prior to data collection, but data are labeled with a unique patient identifier allowing for both patient-level and encounter-level analyses. Fifteen of the original 16 SBHC sites submit data to this database. For this study, we restricted our analytic sample to the 12 sites that remained open and had at least 1 encounter during the year following the pandemic-related school closures.

### Measures

Demographics are extracted from the SBHC electronic health record and included gender, age, race, and ethnicity. Gender is defined as male or female. To harmonize race and ethnicity categories across sites, race/ethnicity was categorized as Asian, black, Latinx, white, and 2 or more race/ethnicities. Based on patient age at the time of service, we classified student-aged patients as 6 to 19 and all others (0-5 and over age 19) as nonstudent aged.

Diagnostic codes and billing codes were extracted for each encounter. We grouped codes based on the Clinical Classifications Software Refined (CSSR) For ICD-10-CM diagnoses. CSSR aggregates ICD-10 diagnosis codes into "clinically meaningful categories across 21 body systems, which generally follow the

structure of the ICD-10-CM diagnosis chapters".<sup>1,14</sup> For analyses regarding adults, we selected common primary care diagnoses including: hypertension, obesity, diabetes mellitus, lipid metabolism, and mental health pathologies. Common primary care diagnoses were chosen because their prevalence and incidence were unlikely to change and access to primary care is critical to their management.<sup>15</sup> Student diagnosis groupings were based on the National School-Based Health Alliance National Quality Indicators for school-based health (Quality Improvement Resources—School-Based Health Alliance, <https://www.sbh4all.org/what-we-do/initiatives/quality-improvement-resources/>), which include common adolescent diagnoses relating to sexually transmitted infections (STIs) diagnosis, obesity, mental health conditions, and comprehensive preventative health exams, such as well-child visits.

We define the pre-pandemic period as all encounters prior to March, 2020 and the COVID-19 pandemic period is defined as encounters including and following March 2020. We select March 2020 to account for monthly billing schedules and align with COVID-19 pandemic-related school closures, which took place in March 2020 and continued through March 2021 throughout the district.

### Data Analysis

Values for all measures before and during the pandemic-related school closures were summarized using relative frequency. Differences between these time periods were assessed using logistic regression with cluster-robust standard errors to account for clustering within clinics, after adjusting for month of encounter. Analyses were stratified by patient age as we hypothesized that utilization for student-aged versus nonstudent-aged patients may differ, given that students may be more reliant on access to SBHCs via their school. This study was reviewed and determined to be exempt by the UCLA Institutional Review Board.

### RESULTS

As seen in Table 1, the proportion of encounters with student-aged patients decreased during the pandemic. From July 1, 2015 to February 29, 2020, there were a total of 226,213 encounters (approximately 4040 encounters per month) with just over 22% of these encounters occurring with student-aged patients. During the pandemic period of March 1, 2020 to March 31, 2021, there were a total of 52,530 encounters (approximately 4041 encounters per month) across all age groups, less than 14% of which were with student-aged patients.

Table 2 includes descriptive statistics of student-aged and nonstudent-aged patients, before and during

Table 1. Comparison of Pre-Pandemic Versus Pandemic SBHC Utilization

|                  | Pre-Pandemic<br>(July 1, 2015 to<br>February 29,<br>2020), % (N) | Pandemic<br>(March 1,<br>2020 to<br>March 31,<br>2021), % (N) | p-Value<br>(Cluster-Robust<br>Variance<br>Estimation) |
|------------------|--|---|---|
| Students         | 22.14 (50,092)   | 13.70 (7197)  | .001  |
| Nonstudents      | 77.86 (176,121)  | 86.30 (45,333)  |   |
| Total Encounters | N = 226,213  | N = 52,530  |   |

the pandemic. There were no significant differences in race/ethnicity or patient age between the pre-pandemic and pandemic periods for 6- to 19-year-olds. However, during the pandemic, a greater proportion of the encounters were with males.

For nonstudent-aged patients, there were no significant differences in sex or race/ethnicity between the pre-pandemic and pandemic periods. However, the percent of encounters with adults over age 65 increased in the pandemic period.

Table 3 compares diagnosis codes for student-aged and nonstudent-aged patients before and during the pandemic. For student-aged patients, while utilization for most conditions remained stable, the proportion of encounters for well-child exams (25.74% vs. 32.53%,  $p = .042$ ) and for mental health diagnoses (3.67% vs. 9.99%,  $p < .001$ ) increased during the pandemic, compared to the pre-pandemic period. Conversely, the proportion of encounters for preventative health exams among nonstudent-aged patients declined during the pandemic from 24.64% to 17.9% ( $p = .012$ ). While the proportion of encounters for most other health conditions examined remained stable, we also observed an increase in encounters for mental health diagnoses among nonstudent-aged patients from 8.11% before the pandemic to 13.56% during the pandemic ( $p < .001$ ). For student-aged patients, the monthly volume of mental health visits increased from 32.8 encounters per month before the pandemic to 55.3 encounters per month during the pandemic. Similarly, mental health visit for nonstudent-aged patients increased from 255.2 encounters per month before the pandemic to 472.8 encounters per month during the pandemic.

### DISCUSSION

Among this network of 12 SBHCs in Los Angeles that remained open during the pandemic-related school closures, we observed over 52,000 encounters, despite school campuses being closed and clinics coping with staffing and infection-control protocol changes. Most of these visits were with black and Latinx patients in high medical need areas, thus highlighting the unique role SBHCs play in ensuring access to care

Table 2. Differences in Demographic Characteristics for SBHC Encounters before and during the COVID-19 Pandemic

|                | Students % (N)   |  | p-Value<br>(Cluster-Robust<br>Variance<br>Estimation) | Nonstudents % (N)   |   | p-Value<br>(Cluster-Robust<br>Variance<br>Estimation) |
|----------------|--|--|---|---|---|---|
|                | Pre-Pandemic<br>(July 1, 2015<br>to February 29,<br>2020),<br>N = 50,092 | Pandemic<br>(March 1, 2020<br>to March 31,<br>2021),<br>N = 7197 |   | Pre-Pandemic<br>(July 1, 2015<br>to February 29,<br>2020),<br>N = 176,121 | Pandemic<br>(March 1,<br>2020-March 31,<br>2021),<br>N = 45,333 |   |
| Sex            |  |  | .015  |   |   | .938  |
| Female         | 61.74 (30,921)   | 57.11 (4110)   |   | 64.64 (113,840)   | 64.61 (29,285)  |   |
| Male           | 38.26 (19,164)   | 42.89 (3087)   |   | 35.36 (62,265)  | 35.39 (16,044)  |   |
| Race/ethnicity |  |  | .135  |   |   | .127  |
| Latinx         | 78.06 (36,544)   | 79.59 (5143)   |   | 79.16 (131,749)   | 76.96 (32,528)  |   |
| Black          | 17.19 (8045)   | 14.72 (951)  |   | 15.76 (26,230)  | 17.73 (7493)  |   |
| White          | 3.95 (1849)  | 4.86 (314)   |   | 4.24 (7063)   | 4.18 (1766)   |   |
| Asian          | 0.65 (304)   | 0.73 (47)  |   | 0.77 (1282)   | 1.03 (437)  |   |
| 2 or more      | 0.15 (72)  | 0.11 (7)   |   | 0.06 (101)  | 0.10 (43)   |   |
| Age            |  |  | .074  |   |   | .004  |
| 0-5            | 0 (0)  | 0 (0)  |   | 7.24 (12,751)   | 6.75 (3061)   |   |
| 6-12           | 25.31 (12,680)   | 36.81 (2649)   |   |   |   |   |
| 13-19          | 74.69 (37,412)   | 63.19 (4548)   |   |   |   |   |
| 20-64          | 0 (0)  | 0 (0)  |   | 85.58 (150,726)   | 84.58 (38,346)  |   |
| 65+            | 0 (0)  | 0 (0)  |   | 7.18 (12,644)   | 8.67 (3929)   |   |

Table 3. Differences in Diagnoses for SBHC Encounters before and during the COVID-19 Pandemic

|   | Students % (N)   |  | p-Value<br>(Cluster-Robust<br>Variance<br>Estimation) | Nonstudents % (N)  |   | p-Value<br>(Cluster-Robust<br>Variance<br>Estimation) |
|---|--|--|---|--|---|---|
|   | Pre-Pandemic<br>(July 1, 2015-<br>February 29,<br>2020),<br>N = 50,092 | Pandemic<br>(March 1,<br>2020 to March 31,<br>2021),<br>N = 7197 |   | Pre-Pandemic<br>(July 1, 2015 to<br>February 29, 2020),<br>N = 176,121 | Pandemic<br>(March 1, 2020 to<br>March 31, 2021),<br>N = 45,333 |   |
| Well-child exam/<br>preventative health<br>maintenance exam |  |  | .042  |  |   | .012  |
| No  | 74.26 (37,196)   | 67.47 (4856)   |   | 75.36 (132,717)  | 82.10 (37,219)  |   |
| Yes   | 25.74 (12,896)   | 32.53 (2341)   |   | 24.64 (43,404)   | 17.90 (8114)  |   |
| Diabetes  |  |  | .262  |  |   | .785  |
| No  | 99.79 (49,989)   | 99.72 (7177)   |   | 85.05 (149,798)  | 84.55 (38,329)  |   |
| Yes   | 0.21 (103)   | 0.28 (20)  |   | 14.95 (26,323)   | 15.45 (7004)  |   |
| Hypertension  |  |  | .377  |  |   | .429  |
| No  | 99.86 (50,020)   | 99.76 (7180)   |   | 86.55 (152,440)  | 84.51 (38,310)  |   |
| Yes   | 0.14 (72)  | 0.24 (17)  |   | 13.45 (23,681)   | 15.49 (7023)  |   |
| Hyperlipidemia  |  |  | .001  |  |   | .122  |
| No  | 98.36 (49,271)   | 96.82 (6968)   |   | 89.21 (157,116)  | 86.14 (39,049)  |   |
| Yes   | 1.64 (821)   | 3.18 (229)   |   | 10.79 (19,005)   | 13.86 (6284)  |   |
| Obesity   |  |  | .260  |  |   | .594  |
| No  | 89.85 (45,008)   | 88.09 (6340)   |   | 84.09 (148,100)  | 81.92 (37,136)  |   |
| Yes   | 10.15 (5084)   | 11.91 (857)  |   | 15.91 (28,021)   | 18.08 (8197)  |   |
| STI   |  |  | .088  |  |   | .655  |
| No  | 99.46 (49,824)   | 99.67 (7173)   |   | 99.56 (175,345)  | 99.55 (45,127)  |   |
| Yes   | 0.54 (268)   | 0.33 (24)  |   | 0.44 (776)   | 0.45 (206)  |   |
| Mental health   |  |  | <.001   |  |   | <.001   |
| No  | 96.33 (48,256)   | 90.01 (6478)   |   | 91.89 (161,832)  | 86.44 (39,186)  |   |
| Yes   | 3.67 (1836)  | 9.99 (719)   |   | 8.11 (14,289)  | 13.56 (6147)  |   |

for marginalized communities. While we did observe a decline in the overall percent of encounters with student-aged patients, we also observed an increase in encounters for well-child care among 6- to 19-year-olds and for mental health encounters across all age groups.

Current research suggest SBHC's success is in large part due to their co-location on campus.<sup>7-9</sup> This may explain why the percent of encounters for school-aged patients declined during the pandemic, as students were no longer physically present at schools. In contrast, the overall maintenance of



patient volume during the pandemic was surprising. This may suggest co-location is a less important factor for nonstudent patients, particularly those managing chronic conditions. Factors such as trusting relationships formed with practitioners or receiving more culturally relevant care may encourage patients to utilize SBHCs as a medical home. Continuity of care might be fostered by sites that can ensure continued community access despite school campus closures. Fewer studies have focused on the impact of SBHCs on nonstudent patients. This is despite the fact that caregiver health and well-being is associated with child health and education outcomes.<sup>10,16-18</sup> Understanding the value of SBHC care to nonstudent patients is critical to determining the most effective SBHC models.

The increase in SBHC utilization for well-child exams was unexpected, given the elimination of most school activities with mandated exam requirements, such as sports. There is research supporting students' reliance on SBHCs for sensitive and confidential services, such as mental health and sexual health care.<sup>7</sup> However, less is known about the role of SBHCs as a source of routine preventative health care. An in-depth qualitative study revealed guardians used SBHCs for their perceived continuity of care and comprehensiveness regarding well-child exams.<sup>19</sup> This could partly explain the sustained number of student-aged patients receiving well-child exams during the pandemic. However, more research is needed to fully explore this correlation in the pandemic setting. Conversely, the overall volume of students receiving a well-child exam decreased (about 180 encounters per month during the pandemic versus 230 encounters per month prior to the pandemic), indicating SBHCs may have missed high risk students who were more reluctant to seek out care.

Across all ages the substantial increase in mental health visits is notable. The rise in mental health care needs during the COVID-19 pandemic may potentially be attributed to multiple factors including isolation, collective and individual losses, and economic downturn. A working report has shown the pandemic has disproportionately impacted minorities economically, especially early on during the pandemic, which may negatively impact mental health and well-being.<sup>20</sup> The SBHC's included in this study are located specifically in high need areas where communities are mostly BIPOC. Other stressors such as being a caregiver may be linked to higher levels of adverse mental health outcomes and may have added to the mental health burden among adolescents and adults during this time.<sup>21</sup>

For student-aged patients the COVID-19 pandemic resulted in dramatic changes to routines, sources of social support, physical activity, and other healthy coping strategies. Unfortunately, with the closure of schools many students also lost access to school-based mental health support. Together, these factors are

thought to have contributed to the marked rise in mental health-related emergency department visits for children and growing recognition of a child mental health crisis.<sup>22,23</sup> SBHCs are providers of mental health care, especially for low-income students, and expanding access to school-based mental health care may be an important component of the pandemic recovery process.<sup>7,9,24,25</sup>

## **IMPLICATIONS FOR SCHOOL HEALTH POLICY, PRACTICE, AND EQUITY**

The large number of SBHC encounters during a prolonged period of school closure suggests SBHCs can play a critical role in ensuring access to health care for both students and their families even when schools are closed to in-person learning. Our findings support the notion of schools as trusted anchor institutions in our communities. SBHCs might consider models that allow both students and community members continuous access to their services. The sites in our study were all sponsored by Federally Qualified Health Centers, which facilitated providing comprehensive services to community members and allowed for continued in-person staffing despite the school district's pause to in-person educational activities. In addition, locating the clinic on the edge of the school campus made community access physically possible. Of note, not all SBHCs offer mental health resources. Our findings suggest that sustaining and even expanding investments in school-based mental health resources is vital. The American Rescue Plan Act of 2021 was passed into law in March 2021.<sup>27</sup> Within it, there are measures to facilitate a safe return to in-person learning as well as specific funding for school-based mental health needs. Continuation of these supports and distribution of resources to low-income and marginalized communities where access to school-based services might help mitigate the exacerbation of health disparities brought on by the pandemic may be critical to students' recovery.

## **Limitations**

Our study is limited by its focus on SBHCs located within a single, large urban setting serving predominantly low-income and minoritized communities. Hence our findings may not be generalizable to all SBHCs, particularly those in rural settings. Additionally, we were limited by the data elements available. Hence we cannot comment on the utilization, health care needs, or services for individuals who may not have had access to the SBHCs or who choose not to attend appointments due to the ongoing pandemic.<sup>27</sup> We also cannot distinguish between changes in the underlying prevalence of health conditions versus changes in utilization for those conditions. Finally,

while we focus on changes in utilization observed during the pandemic-related school closures, we cannot determine whether these changes were caused by the pandemic versus other secular changes.

## Conclusions

We found that utilization of SBHCs remained high despite prolonged pandemic-related school closures to in-person learning, suggesting that SBHCs may be valued as a critical source of primary and preventive health care for more than just their co-location with daily academic activities. SBHCs might consider strategies to allow continued access to services even when school campuses are closed, particularly in low-income and marginalized communities. In addition, efforts to sustain or expand mental health care might better meet the needs of SBHC clients during the remainder of the COVID-19 pandemic and subsequent recovery.

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