Public Health Measures and SARS-CoV-2 Cases in the Juvenile Justice System: Implications for Pandemic Response in the Detention Setting

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Objective: The purpose of this study was to examine severe acute respiratory syndrome-coronavirus-2 case positivity in juvenile justice facilities of two different states alongside institutional, local, and state public health policies during the first 6 months of the coronavirus disease 2019 pandemic.

Methods: This retrospective chart review examined two large, urban juvenile justice centers in California and Texas. Positive intake or day 12 tests were considered suggestive of community-acquired severe acute respiratory syndrome-coronavirus-2 infection. Researchers examined state and county restrictions, closings, and openings. The study included all of the youths 10 to 18 years residing in the facilities between March and August 2020. The main outcomes measured case positivity in each facility and compared it with community positivity rates and state public health measures.

Results: In total, 530 youth were included (Texas, n = 319; California, n = 211). The Texas facility reported a higher number of positive cases (24) versus the California facility (3) ($P < 0.05$). Of the positive youth, 70% were asymptomatic, and none required hospitalization. Intake and day 12 tests were positive in <1% of California youth compared with a rate of 4% in Texas ($P < 0.05$). California and Texas instituted mask mandates in May and July 2020, respectively. California restricted indoor capacity until August, but Texas varied from 25% to 75% capacity through July.

Conclusions: The Texas facility reported a higher percentage of community-acquired infections compared with California, coinciding with reopening measures in Texas. Texas also enacted a mask mandate later than California. These public health measures, among other factors, likely contributed to higher community rates in Texas, thereby affecting rates among the detained youth.

Key Words: detention, infection control, infectious disease, juvenile justice, public health

Since the declaration of a pandemic in March 2020, coronavirus disease 2019 (COVID-19), an infection caused by the novel coronavirus severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2), has resulted in millions of deaths worldwide.[1] The pandemic has highlighted health and social inequities and disproportionately affected certain populations,[2] including youth residing in juvenile justice centers (JJCs).[3–5] Youth in the juvenile justice system are a vulnerable population, often having "unmet medical, mental, health, and social needs."[6,7] They are "more likely to be youth of color; and more likely to have been exposed to adverse childhood experiences."[6,7] Although the impact from the pandemic varied widely across communities, there has been further disproportionate risk for youth within JJCs, especially given the nature of shared housing within congregate care facilities.[6]

Throughout the pandemic and during case surges, US states responded with individual infection control efforts to reduce disease transmission. Initially, many states issued shelter in place orders and others implemented work from home orders that allowed only essential personnel to report to workplaces. States implemented a variety of public health interventions to decrease

Key Points

- The number of SARS-CoV-2 infections among youth in custody can reflect the public health measures of the surrounding community. This is a population that should be considered closely and early during infectious disease outbreaks.
- Proactive institutional infection control measures, protective public health interventions, and comprehensive testing can mitigate risks to the health of youth and staff within juvenile justice facilities.
- Public health policies in different US states may have contributed to differences in the local community spread of coronavirus disease 2019 and should take into consideration vulnerable populations when responding to an evolving public health crisis.

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disease transmissions, including face-covering mandates, limits to public gatherings, restricting nonessential businesses, and school closures. Although these measures affected SARS-CoV-2 transmission within communities, local infection prevalence posed an ongoing risk to youth and staff entering juvenile justice facilities.[4,8] As cases of COVID-19 surged across the United States, the American Academy of Pediatrics and the Society for Adolescent Health and Medicine advocated to quickly decrease the number of youths in JJCs in an effort to reduce exposure, especially given that most youth are held for nonviolent offenses.[6,9] Despite those efforts, there were 3936 youth with documented positive cases and five staff member deaths in JJCs as of March 31, 2021.[5]

Although the literature regarding the impact of COVID-19 among detained populations is expanding, there remains a paucity of data on adolescents in custody despite a more significant disease burden within this group when compared with their nondetained peers.[10,11] We set out to examine the SARS-CoV-2 case positivity during the first 6 months of the pandemic in two JJCs located in different states, as well as describe the public health measures enacted at that time.

Methods

A retrospective chart review at two large county JJCs was conducted from March through August 2020. Institutional review board approval was received from the University of Texas Houston (UTHealth) McGovern Medical School and from the approval bodies of both JJCs. The centers, located in California and Texas, admit patients from across their respective counties encompassing a diverse patient population and included pre- and postadjudication facilities. These sites were chosen because of their early collaboration on infection control practices and testing strategies, making comparisons between institutions feasible. Both sites required early masking of staff and youth, social distancing, and separate intake units. The following describes the initial protocols followed by the study sites.

On the intake units, youth remained in medical isolation for 24 to 48 hours until the first SARS-CoV-2 test result was obtained. If positive, the youth were moved to a medical isolation floor based on the most current Centers for Disease Control and Prevention recommendations.[12] If negative, youth followed unit precautions, including socially distanced programming and retesting on the 12th day of admission. If the day 12 test was negative, youth were moved to the general population. For analysis purposes, both the intake and day 12 test were considered consistent with community-acquired infection based on the 14-day incubation period.[13] If youth reported symptoms or high-risk exposure during admission screening or while in the general population, they were moved to a separate unit and treated as "persons under investigation" (PUI).[14] Youth remained in this unit until they tested negative and/or experienced clinical improvement for at least 3 days. PUIs and youth who tested positive >14 days after arrival were considered to have acquired the infection within the facility and contact tracing was conducted.

All youth between the ages of 10 and 18 years, who were admitted to or residing in one of the two JJCs and completed SARS-CoV-2 testing via nasopharyngeal, nasal, or oral swab-based reverse transcriptase-polymerase chain reaction between March 2, 2020 and August 31, 2020 were included. Initially in the study period, SARS-CoV-2 tests were only ordered based on clinical need, especially because access to testing materials and personal protective equipment was extremely limited. During this time and before the onset of routine testing, only youth with symptoms (PUI) or high-risk exposures were tested. Routine testing began in California in April 2020 and in June 2020 in Texas; both facilities used intake and day 12 testing. As testing capacity increased, orders were placed per protocol: upon admission, 12 days after admission, for symptoms, for exposures to known positives, before any medical/dental procedure, and before facility transfer/placement as needed (Fig. 1). If the test was collected within 1 to 2 days of admission, then it was identified as an "intake test." If the test was collected between 12 and 14 days of admission, then it was identified as a "day 12 test." The date of admission and the date of laboratory values collection were matched to the corresponding admission week according to Appendix A to maintain confidentiality (Supplemental Digital Content Appendices, http://links.lww.com/SMJ/A319). Youth who did not complete SARS-CoV-2 testing were excluded; these included youth who were discharged shortly after being brought to a JJC via "cite-and-release" or those who refused testing.

California

Results were extracted by searching the electronic health record for SARS-CoV-2 tests collected in either preadjudication or postadjudication facilities between March 2, 2020 and August 31, 2020. The patient's admission and discharge dates for identified tests were extracted. In addition, race and ethnicity data as recorded in the electronic health record were extracted. A second reviewer checked every 10th patient for accuracy. For analysis and consistency with the partner site, groups were collapsed into five race/ethnicity groupings, including White or Caucasian, Hispanic or Latinx, Black, Asian, and Other.

Texas

Results were extracted from laboratory records kept in a secure binder in the medical clinic of the JJC and tracking spreadsheets developed by physicians in the facility between March 15, 2020 and August 31, 2020. The patient's testing date and identification were extracted from the laboratory sheets collected from preadjudication and postadjudication facilities. The researchers conducted manual reviews of the medical record for symptoms and demographic information. A second reviewer checked every 10th patient for accuracy. Race was recorded by nursing staff upon intake as White, Black, Asian, or Other. Ethnicity (Hispanic or non-Hispanic) was extracted from the medical record.

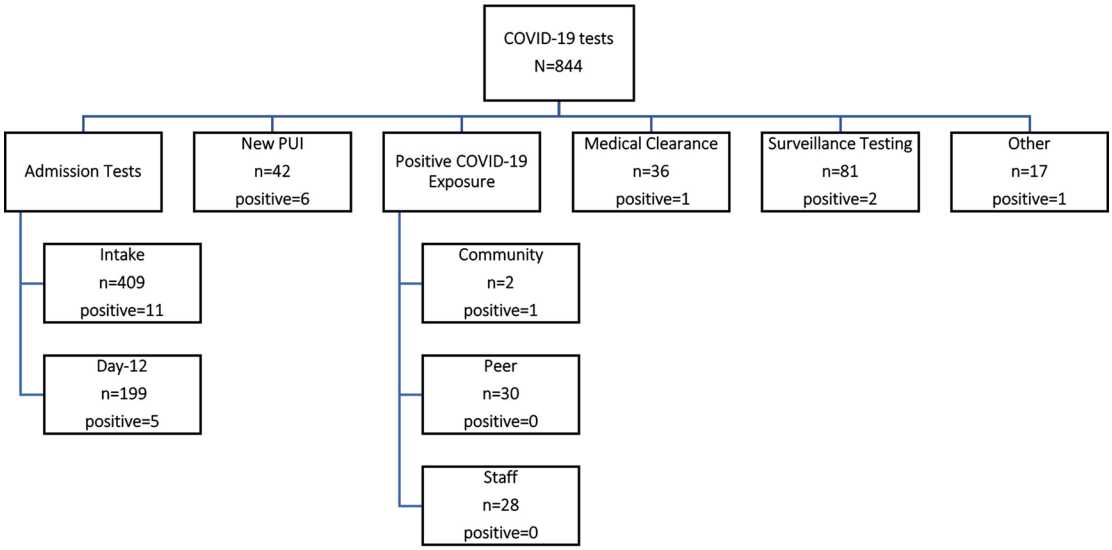

Fig. 1. COVID-19 tests, results, and rationale for testing among youth between the ages of 10 and 18 years, admitted to or residing in one of the two juvenile justice centers between March 2020 and August 2020. COVID-19, coronavirus disease 2019; PUI, persons under investigation.

The local community case rates were obtained from the online COVID-19 dashboard for the counties of each respective facility. For Texas, the case rate was displayed on the dashboard as a 14-day positivity rate and then transcribed into a Microsoft Excel spreadsheet (Microsoft, Redmond, WA) to generate a county positivity graph. For California, the case rate was calculated manually as a 14-day positivity rate based on raw, new weekly test numbers and then transcribed into an Excel sheet to generate their county positivity graph.[15]

Researchers from California and Texas examined state and county restrictions, closings, and openings. For a detailed list of public health measures that affected each state, see Appendix C. Researchers also referenced state and county dashboards for case numbers along with percent positivity rates.[15,16] We graphed comparisons between the public health measures, cases in the community, and cases in the JJCs.

Deidentified data were entered separately into REDCap by each research group. Each facility maintained a separate log to link youth-specific information and the assigned study number. The data were analyzed using Excel and STATA version 14 (StataCorp, College Station, TX). The comparison of SARS-CoV-2 positivity rates between institutions was calculated using the Fisher exact test. A waiver of consent was requested and granted because all of the information from the youth was deidentified. The studies were approved by regulatory bodies at each institution.

Results

A total of 530 youth was included in the study (Texas, n = 319; California, n = 211). This included 436 (82%) males (mean age of 15.6 years [standard deviation 1.2]). Both facilities had roughly the same proportions of male to female residents (Table). The race and ethnic distributions between the facilities were different but consistent with prepandemic trends within each facility. The population of youth at the Texas facility was predominantly Black (48%) and Hispanic or Latinx (38%), whereas the California facility was primarily Hispanic or Latinx youth (74%).

Table. Demographic information

	Texas, n = 319	California, n = 211	Combined, N = 530
Age, y, mean (SD)	15.3 (1.1)	16.0 (1.22)	15.6 (1.21)
Sex			
Male, n (%)	262 (82.1)	174 (82.5)	436 (82.3)
Female, n (%)	57 (17.9)	37 (17.5)	94 (17.7)
Race/ethnicity			
White or caucasian, n (%)	44 (13.8)	23 (10.9)	67 (12.6)
Black, n (%)	154 (48.3)	15 (7.1)	169 (31.9)
Hispanic or Latinx, n (%)	121 (37.9)	155 (73.5)	273 (52.1)
Asian, n (%)	0 (0)	6 (2.8)	6 (1.1)
Other race, including multiracial, n (%)	0 (0)	12 (5.7)	12 (2.3)

SD, standard deviation.

The Texas facility reported a statistically significant higher number of positive cases (n = 24, 7.5%) compared with the California facility (n = 3, 1.4%) during the study period ($P = 0.002$). Among those youth tested for intake or day 12, 14 of 347 (4%) youth in the Texas facility and 2 of 261 (0.7%) youth in the California facility tested positive for SARS-CoV-2 ($P = 0.018$). In California, one youth tested positive on day 14 for medical clearance. There were no associated staff or youth positive cases, making this consistent with community-acquired infection. Two asymptomatic youth were identified during surveillance testing in the Texas facility during weeks 15 and 16. Recurring asymptomatic surveillance testing of all youth at the California facility began in November, outside of the study window. At both facilities, none of the youth tested positive for peer exposure or staff exposure.

The average age among positive youth was 15.4 years and most (93%) were boys. Of the positive youth, 70% were asymptomatic and none required hospitalization. The most frequently reported symptoms were sore throat or new loss of taste/smell. The community positivity in the California facility's surrounding county was near 10% around week 7 of the study, when their first case was identified (Fig. 3). Among the cases at the Texas facility, four positive youth were admitted more than 2 weeks before the start of the study and were tested for infection because of new PUI status (n = 3) or other indications (n = 1). The highest number of positive cases for a given admit week was four out of 25 tests at the Texas facility on week 17 when the community positivity rate was 23% (Fig. 2). The local 14-day community positivity average in Texas peaked 2 weeks later, at approximately week 19.

State and county governments implemented a variety of public health measures to decrease the transmission of SARS-CoV-2 within the community (Appendix C). We compared these policies with the 14-day average test positivity rate of SARS-CoV-2 cases (Figs. 2 and 3). California issued a shelter in place order on March 16, 2020 (week 3), mandating self-isolation at places of residence for all county residents except for essential services.[17] Subsequently, a decrease in community positivity is noted, reaching a nadir at approximately week 15, then slightly increasing and plateauing at approximately week 22. California lifted its shelter in place order on May 30 (week 13) and restaurants were allowed 50% capacity by June 15 (week 15) for outdoor seating only. The Texas facility's county implemented a work from home order on March 24, 2020 (week 4), allowing essential businesses to remain open.[18] The state test positivity rate remained stable, with the individual county reporting positivity rates beginning at week 10.[16] Texas began reopening with a three-phase strategy between weeks 11 and 15 but reinstated limits in week 16 because of the increasing number of cases. The first reopenings that allowed indoor activities in California did not occur until late August 2020 and then ensued further outside the time scope of this study. A mask mandate for California began in May (week 12); Texas issued a mask mandate in July (week 18), 1 week before the peak in 14-day average test positivity in the county.

Discussion

The incidence of SARS-CoV-2 cases remained low in the two JJCs during this study period, with most youth experiencing no symptoms or only mild disease; however, Texas reported a significantly higher proportion of SARS CoV-2 cases among detained youth compared with California corresponding to the higher community rates in that state. Nearly 50% of the population at the Texas facility were Black youth and nearly three-fourths of the California facility population identified as Hispanic/Latinx, mirroring the baseline and prepandemic ethnic breakdown of each facility.[19,20] The demographics from each facility again demonstrate that minority youth are disproportionately represented in

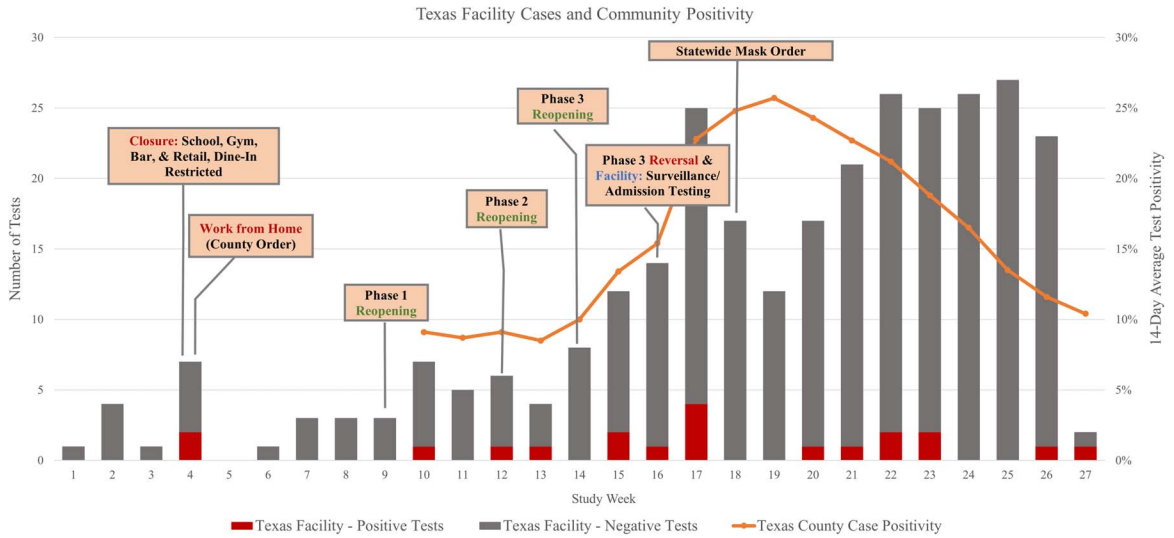

Fig. 2. Texas facility cases and 14-day average test positivity rate. Graph of all tests performed within the detention center in Texas measured by the left vertical axis. Superimposed is the line graph of 14-day average test positivity rates for severe acute respiratory syndrome-coronavirus in the surrounding county where the facility is located, which is measured by the right vertical axis. In addition, public health measures that were enacted on the institutional, local, and state levels are denoted based on the week that they were implemented.

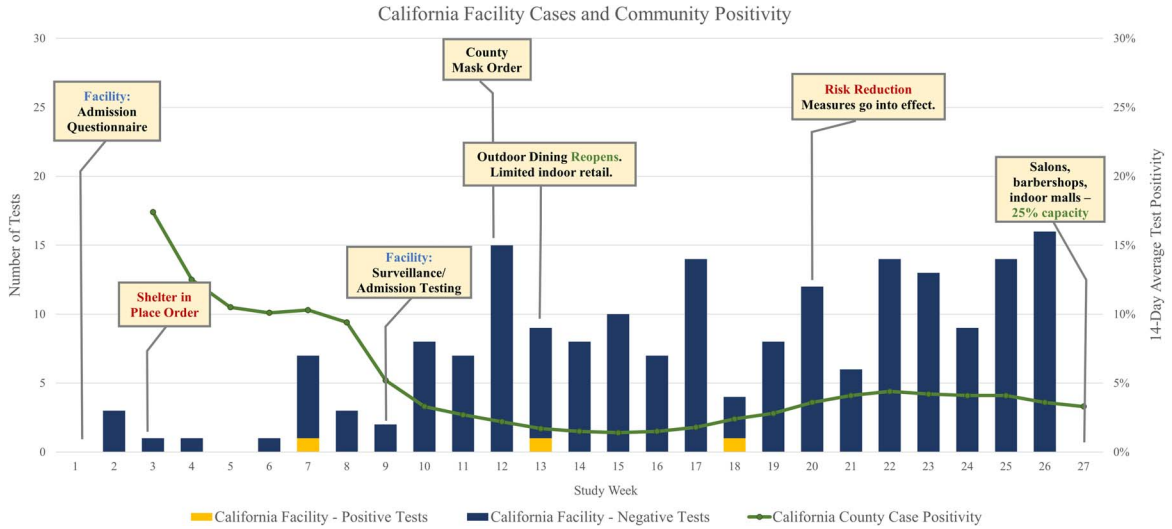

Fig. 3. California facility cases and 14-day average test positivity rate. Graph of all of the tests performed within the detention center in California measured by the left vertical axis. Superimposed is the line graph of 14-day average test positivity rates for severe acute respiratory syndrome-coronavirus-2 in the surrounding county where the facility is located, which is measured by the right vertical axis. In addition, public health measures that were enacted on the institutional, local, and state levels are denoted based on the week that they were implemented.

the juvenile justice system,[7,21] and thus may in turn be disproportionately represented among positive SARS-CoV-2 cases within juvenile justice facilities.

No youth tested positive because of peer exposure or staff exposure during the study period at either institution, reflecting effective internal infection control and screening measures (Fig. 1). The steps each institution took played a pivotal role in the prevention of uncontrolled disease spread. Most infections at both institutions resulted from positive intake or day 12 tests, indicating community-acquired infection. Infection control practices such as 14-day new admission units, two-point testing for medical clearance, and quarantine for exposure or isolation for symptomatic patients per Centers for Disease Control and Prevention guidelines mitigated the risks in both centers. Both institutions also instituted youth and staff masking in stages, eventually adopting universal masking for all individuals.

Undoubtedly, this was a key intervention in mitigating disease acquisition and transmission. It should be noted that six PUI cases at the Texas facility, three of whom had been in the facility well before the start of the study, did test positive. This suggests either disease transmission from visitors early in the pandemic or facility-acquired infection; however, these youth had no known peer or staff exposure at the time of testing. None of the positive PUI patients contributed to an internal outbreak, once again highlighting effective internal infection control methods. Some adult jail facilities in the country experienced higher spread within their institutions when infection was introduced, although they had higher resident volume and likely more chronic health conditions as a result of older age groups.[22,23] The fact that both the California and Texas JJCs maintained relatively low case numbers and minimal spread within the institutions is noteworthy given the challenges of infection control in congregate care settings.

In the initial stages of the pandemic, overall community incidence was likely higher than reported rates because of asymptomatic carriers and lack of testing. Newly admitted, positive, and asymptomatic youth did pose a facility risk before the rigorous infection control measures; however, infection risks were heightened because of staff movement in and out of facilities. Because of the potential for asymptomatic spread, known to be more common among adolescent populations, it is crucial that intake screening and surveillance testing occur to mitigate the risks posed by SARS-CoV-2 and to prevent disease transmission in high-risk congregate settings.[24,25] Staff testing and maintenance of rigorous facility infection control measures also contribute to risk reduction. Although testing strategies should be aligned with local public health data, with the frequency of testing informed by community incidence, detained populations remain at higher risk than the general population for COVID infections,[26] and more aggressive strategies may be needed. In addition, decreasing detained populations is vital for the health of those who live and work in these facilities and is a key public health intervention. Not only are youth exposed to a greater risk of contracting SARS-CoV-2 while in custody but also positive, symptomatic, or exposed youth may inadvertently become potential sources of infection when discharged and returned to their communities.[5,6]

California reported an increase in COVID-19 cases earlier than did Texas. This and other variables led to earlier interventions, including masking and the shelter in place orders. Texas followed shortly and made efforts to "flatten the curve." Following the plateau in cases, Texas moved to reopening phases.[27] All of these measures affected youth in custody and staff. The peak of positive cases in the Texas facility occurred in week 17, but only peaked in the community at week 19. Testing in JJC settings can provide benefits for youth through the identification of asymptomatic infection, which is an added public health

benefit, especially when community testing resources may be limited. The patterns identified in this study demonstrate the importance and impact of public health measures on the community as they relate to congregate settings such as JJCs.

The study was limited by the availability of SARS-CoV-2 data from early in the pandemic, especially in Texas, because national COVID-19 cases began in the Pacific Northwest and moved quickly to California.[28] Limited testing capacity, only conducted for narrow clinical criteria, likely influenced the initial high positivity rate for California, for example. It also is limited by the different dates that routine screening and testing procedures began, with the California facility implementing regular testing before the Texas facility. We cannot provide a true incidence of community COVID-19 cases because there was no initial routine surveillance testing accounting for at-risk population from week to week. The differences in number of local cases and the variations in community testing in the surrounding areas could have contributed to the differences in institutional cases; however, differences in public health measures may have also affected case positivity in the community, in turn affecting the number of cases present upon admission to our facilities.

Our study demonstrated patterns from two large urban facilities and their respective county and state public health interventions during the first 6 months of the COVID-19 pandemic. As the pandemic evolved with intermittent surges in infection rates globally, nationally, and locally, both facilities continued to reflect their respective community infection rates. As such, future studies should explore analyzing the positive cases and COVID-19 outbreaks in JJCs during the course of the pandemic onset and compare rates across multiple institutions in relation to public health measures.

Conclusions

We cannot conclude that what we observed implies causation; however, the Texas JJC reported a statistically higher number of cases of COVID-19 compared with the California JJC. The Texas facility also reported a higher percentage of community-acquired infections compared with the California facility, coinciding with rates of infection in the local Texas community. Our findings highlight that the number of COVID-19 infections among youth in custody are lower than community incidence, but they may reflect public health measures within the surrounding community. In addition, aggressive infection control measures and comprehensive testing strategies can mitigate risks and support the health of youth and staff within JJCs.

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