Lessons Learned:
COVID-19 in Post-Corrections Secured Behavioral Rehabilitation

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Abstract

Background: The COVID-19 case rate on June 5, 2020, for prisoners in the United States (US) was 5.5 times higher than the US population case rate (Saloner et al., 2020). Secure facilities were challenged to mitigate the spread of COVID-19. One secure behavioral rehabilitation facility made many changes to facility and program protocols to meet this challenge.
Methods: The purpose of this program evaluation was to assess newly implemented infection control measures at a secure behavioral rehabilitation facility and to inform policy and procedure recommendations for the mitigation of COVID-19 transmission in congregate living facilities in the future. Case rates, percent positivity, and case fatality rates were used as surrogate measures to evaluate this facility's COVID-19 program. A PRECEDE/PROCEED logic model was used to guide the program evaluation.
Results: Attack rates varied significantly by unit, from 1 resident case (3.94%) to 31 cases (92.26%). The 7-day rolling average ranged from 0.0% to 4.34% positivity during the study period, and 205/355.6 residents (57.56%) were infected during the 3-month study period.
Conclusions: COVID-19 places significant logistical and human strain on residents, employees, and administrators of secured congregate settings. Despite extensive infection control measures, the study facility experienced a significant number of cases, special hospitalizations, and deaths. Further research is recommended to define adequate infection control measures to vulnerable populations in such settings.
Keywords: COVID-19, post-release programs, infection control, congregate setting, program evaluation

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Background

By the summer of 2020, the COVID-19 case rate for incarcerated individuals in the United States (US) was 5.5 times higher than the (US) population case rate (Saloner et al., 2020). Likewise, the age-adjusted prevalence estimates of conditions associated with severe COVID-19 were significantly higher for inmates than for the non-elderly, non-institutionalized population (Binswanger et al., 2009; CDC, 2021). As of November 2021, the Centers for Disease Control and Prevention (CDC) attributed 441,466 COVID-19 cases and 2,845 deaths to incarcerated individuals (CDC, n.d.). Incarcerated individuals suffered disproportionally from COVID-19, perhaps because of the unique risks of COVID-19 spread in congregate settings. As the pandemic progresses, reviewing facility responses may yield an opportunity to refine best practices to reduce morbidity and mortality in future infectious disease outbreaks.

Novinsky et al.'s (2020) survey of the Department of Corrections (DOC) Bureau of Prisons (BOP) COVID-19 data highlighted mitigation efforts and challenges presented in a secured setting. All 51 surveyed areas transitioned from in-person to alternative communication for visits (Novinsky et al., 2020). Infection control measures varied across facilities (Novinsky et al., 2020). Hand sanitizer remained contraband in most facilities due to high alcohol content and ingestion risk (Novinksy et al., 2020). Maintaining an appropriate distance is challenging for individuals in congregate living facilities, and person-to-person spread of COVID-19 through respiratory droplets is significantly increased if individuals are less than six feet from one another (CDC, 2020b). Individuals who are incarcerated participate in activities of daily living together, creating the opportunity for virus proliferation (CDC, 2020a). Inter-facility transfers, staff interactions, and medical, legal, or family visits create opportunities for virus introduction into facilities (CDC, 2020a).

Despite the challenges of mitigating exposure to COVID-19 among incarcerated individuals and national data indicating disproportionately high case rates, the literature review showed a lack of information about the effectiveness of mitigation programs. Data collection and reporting practices varied across facilities, complicating analysis of outbreaks. Multiple authors called for greater data transparency and uniformity in reporting across states and facilities (Gibson, 2020; Novinsky et al., 2020; Sun et al., 2020, Yi et al., 2020). More information was needed about programmatic efforts and outcomes in secure facilities.

Purpose

One secure behavioral rehabilitation facility was challenged to mitigate the spread of COVID-19. The facility is unique in that it maintains security features like a correctional facility and offers court-ordered, individualized rehabilitation. There were many changes to protocols to meet the COVID-19 challenge in this setting. A program evaluation was needed to understand the utility of such changes and to recommend improvements. The purpose of this evaluation was to inform future policy and procedure recommendations for the mitigation of COVID-19. Case rates, percent positivity, and case fatality rates were used as surrogate measures to evaluate the facility's COVID-19 program. While a true program evaluation would have been ideal, data limitations allowed only for the description and analysis of the situation using a program evaluation lens with the goal of guiding future programmatic decisions.

Methods

The PRECEED/PROCEED (Green & Kreuter, 2005) and CDC (2018) logic models, often applied to public health program evaluations, provided structure to this evaluation. This is considered a "shoestring evaluation," as there was no funding or available control group and it occurred late in the outbreak (Bamberger et al., 2004).

Following Institutional Review Board approval at the facility and James Madison University, retrospective data collection of SARS-CoV-2 test results and review of facility responses, policies, and procedures informed this evaluation. Cases were obtained from periodic mass testing and facility-initiated testing during the study period. Positive results from Polymerase Chain Reaction (PCR) and rapid antigen (RA) tests were counted cases. An individual testing positive by more than one test within 90 days was counted as one case.

Setting

The evaluated facility is a secure behavioral rehabilitation center in the rural southeastern US. It receives civilly committed individuals immediately post-incarceration for behavioral rehabilitation, which must be completed before court-ordered release into the community. The facility serves the entire state.

Study Sample

The study sample included residents residing in the main facility building from October 1, 2020, through December 31, 2020. This excludes data from residents housed in an adjacent building or off-site, in the case or census counts for this study. All individuals in the study were biologically male per medical record review.

Sources of Data

The facility infection control nurse maintained the facility outbreak line list, which contained case information including demographic, morbidity, and mortality details. This served as the primary data source. Individual resident chart review occurred when clarification was needed. Communications from administrative staff regarding changes in policy during the study period due to COVID-19 were reviewed. Email and telephone communication provided further clarification of policy and procedure when necessary. Due to the shoestring nature of this evaluation, mask use, handwashing, and social distancing could not be directly measured on each unit. The infection control nurse and chief nurse executive functioned as "key informants." Bamberger et al. (2004) suggests that individuals in such roles can provide information when data are scanty. While local health district data and facility policy were used in this study, these citations are redacted to protect privacy.

Data Analysis

Cases were obtained from mass testing and facility-initiated testing during the study period and descriptive statistics calculated from them. Positive cases were counted by unit and for the entire facility. The average unit and facility census was used when calculating percent positive and attack rates. The mean unit and facility censuses were calculated by averaging the census on mass test dates every two weeks during the study period, from October 8, 2020, through December 8, 2020. This contrasts with the usual percent positive calculation in community settings, which uses the total number of tests as the denominator. Any prior positives were removed from the denominator when calculating percent positivity.

Results

The bimonthly census of the units ranged from 341 to 364, with an average bimonthly census of 355.6. The average unit bimonthly census between the living units ranged from 22.2 to 38.2 residents. Staff were not counted in the number of individuals tested or in positive case counts but were considered an input due to participation in policy changes.

Infection control measures included facility COVID-19 policy and policy changes over the study period. These changes included restricted movement in the facility, the use of personal protective equipment (PPE), routine cleaning and decontamination, limitations on package delivery, limiting and logging the number of staff entering the unit per department, communications to employees reiterating guidance and other relevant information, isolation on quarantine units for positives, and eventual confinement of residents to units but not individual rooms.

Interviews with staff, emails, and observations demonstrated variation of activities over time and among units. There were early barriers to staff using PPE that were later resolved. In November 2020, a rise in cases precipitated residents being confined to living units but not to individual rooms. Adherence to infection control guidelines (social distancing, masking, and cleaning) varied by unit. The units with the lowest infection rates were observed by staff as having greater compliance with infection control guidelines.

Any resident who tested positive less than 90 days prior was not retested at bi-weekly mass testing or facility-initiated testing events. Some residents refused testing at mass testing events but consented to test between events due to exposure or symptoms. Overall, resident compliance with testing decreased over time, with 10 (2.75%) residents offered testing refusing tests on the first mass test date and 31 (8.66%) refusing tests on the final test date.

Total facility case rates were measured. Case rates between units were also compared. The total facility number of cases over the study period was 205, with an average census of 355.6 residents. Two residents consistently refused testing. They were not counted as positive cases for this study. There were 74 positive tests results obtained from the five mass test dates. Further, 131 positive test results were obtained from symptom screening by facility providers and nurses from testing close contacts of positive cases. Of the 205 cases, 123 (60%) occurred in approximately the last third of the study period. Positive cases per unit ranged from 1 to 34.

The percent positive for the facility was calculated as a seven-day rolling average. The average facility census was used as the denominator, removing the prior positives (Figure 1). The rolling seven-day average range exceeded 1% only eight days in the first two months of the study period, with a range of 0% to 2.33% from October 1, 2020, to November 27, 2020. From November 28, 2020, to December 31, the seven-day rolling average ranged from .05% to 4.34%.

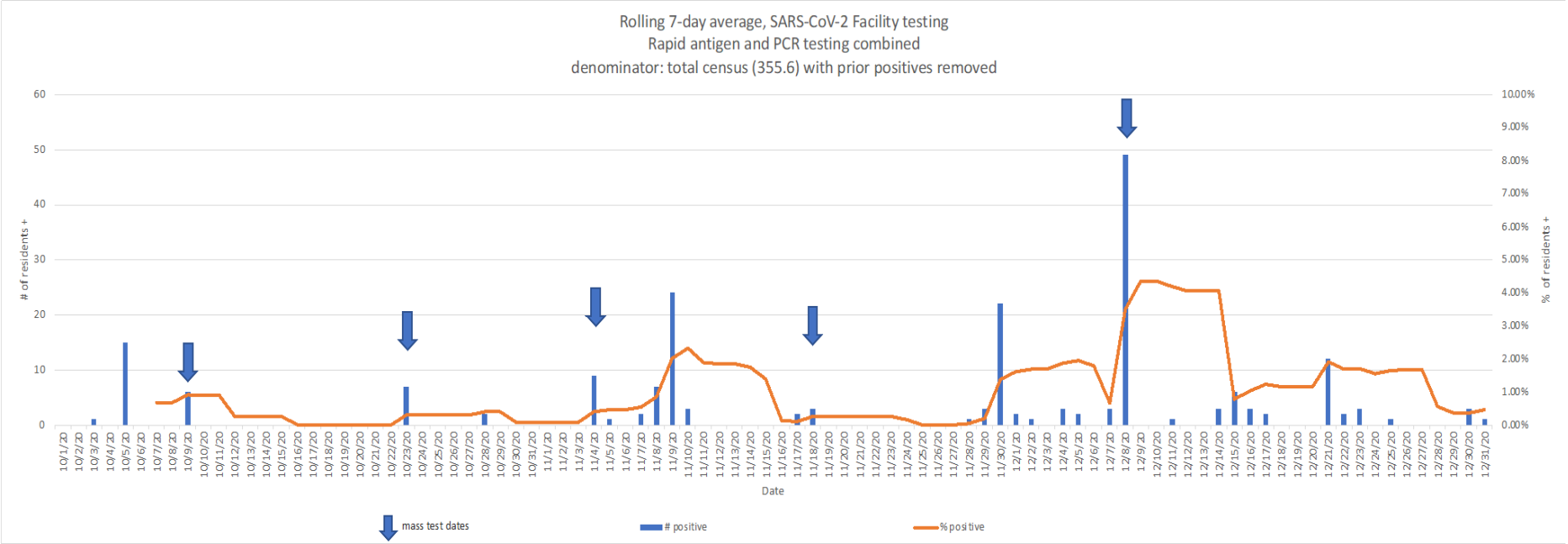


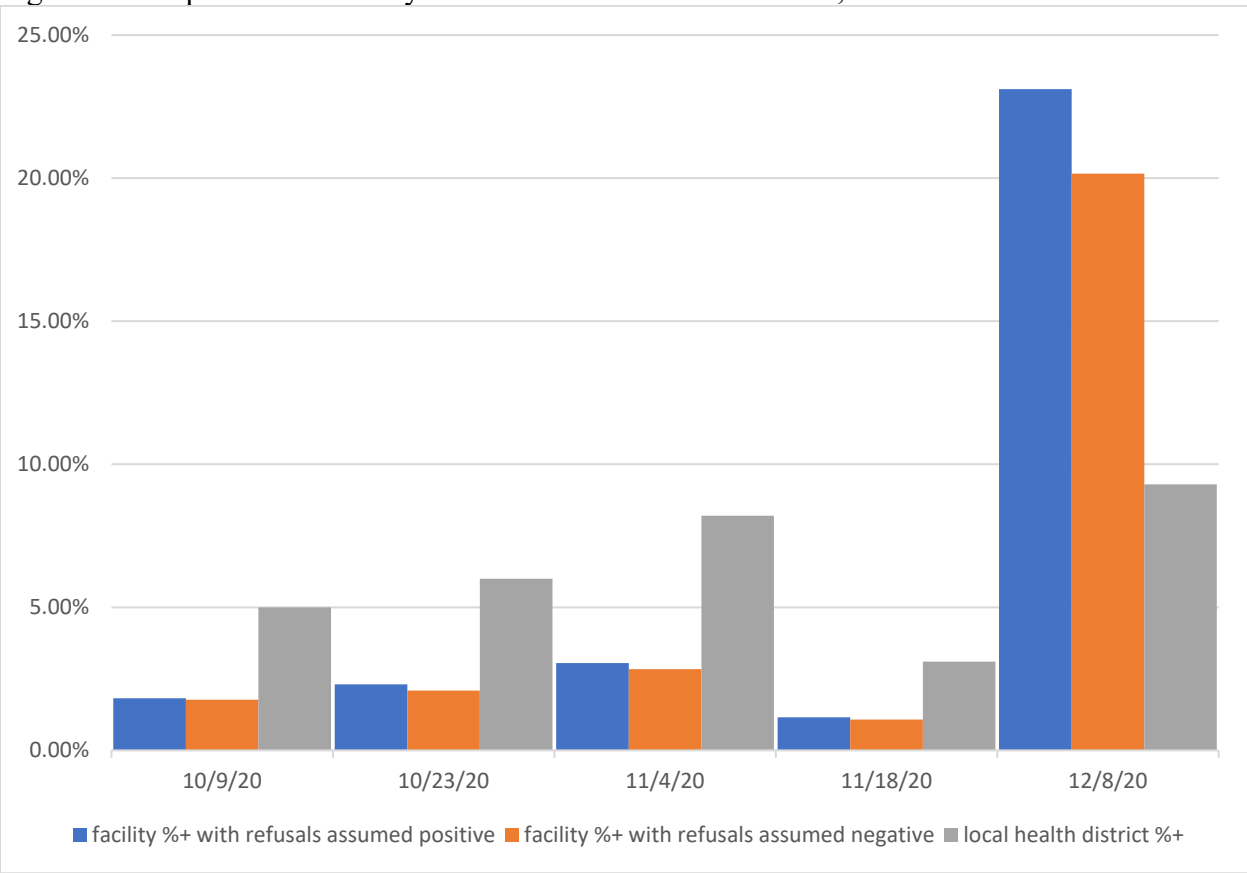
Figure 1. Rolling 7-day average %+ and case count, SARS-CoV-2 Facility testing

Note: Rapid antigen and PCR testing combined. Due to total number of tests completed per day being unknown, denominator : total census (355.6) with prior positives removed

The calculation of test-over-test (number positive over number of tests completed) could not be performed and the number of tests completed daily is unknown. Test-over-test calculation was performed for each mass test date. The percent positive was calculated to account for test refusals as either positive cases or negative test results, resulting in a variation between 0.05%-2.95% in percent positivity on mass test dates (Figure 2).

A continuous comparison to the local health district rates was not made, due to the dissimilarity between the local health district and the facility. No direct correlation can be made between local health district rates and the facility's rates, due to the obvious difference between a transmission in a closed environment and the community at large. The general directional trend in percent positivity, however, is similar to that in the local health district. It is likely that the facility's contribution to the health district's overall percent positive rate was significant (Figure 2).

Figure 2. Comparison of Facility %+ to Local Health District %+, Mass test dates



The attack rate per unit varied significantly. Attack rates for Units 6, 13, and 14 were not calculated, as these units were used for only isolation and quarantine and did not maintain a census. The attack rate ranged from 3.94% (n=1) on Unit 12 to 92.26% (n=31) on Unit 3. The attack rates on Unit 9, 5.81% (n=2) and Unit 5, 18.02% (n=4), were among the lowest, with the remainder of the unit attack rates 45.18 % and higher. It is recognized that while not measured, there were varying rates of resident adherence to infection control guidelines, with the infection control nurse reporting residents of Unit 9 adhering to social distancing by setting living unit chairs apart during television watching and by organizing cleaning chores on the unit. Unit 5 residents require a higher level of assistance with activities of daily living. Increased staff assistance and reminders may be attributed to a lower attack rate on this unit (Figure 3).

Figure 3. Facility Attack Rate per Unit

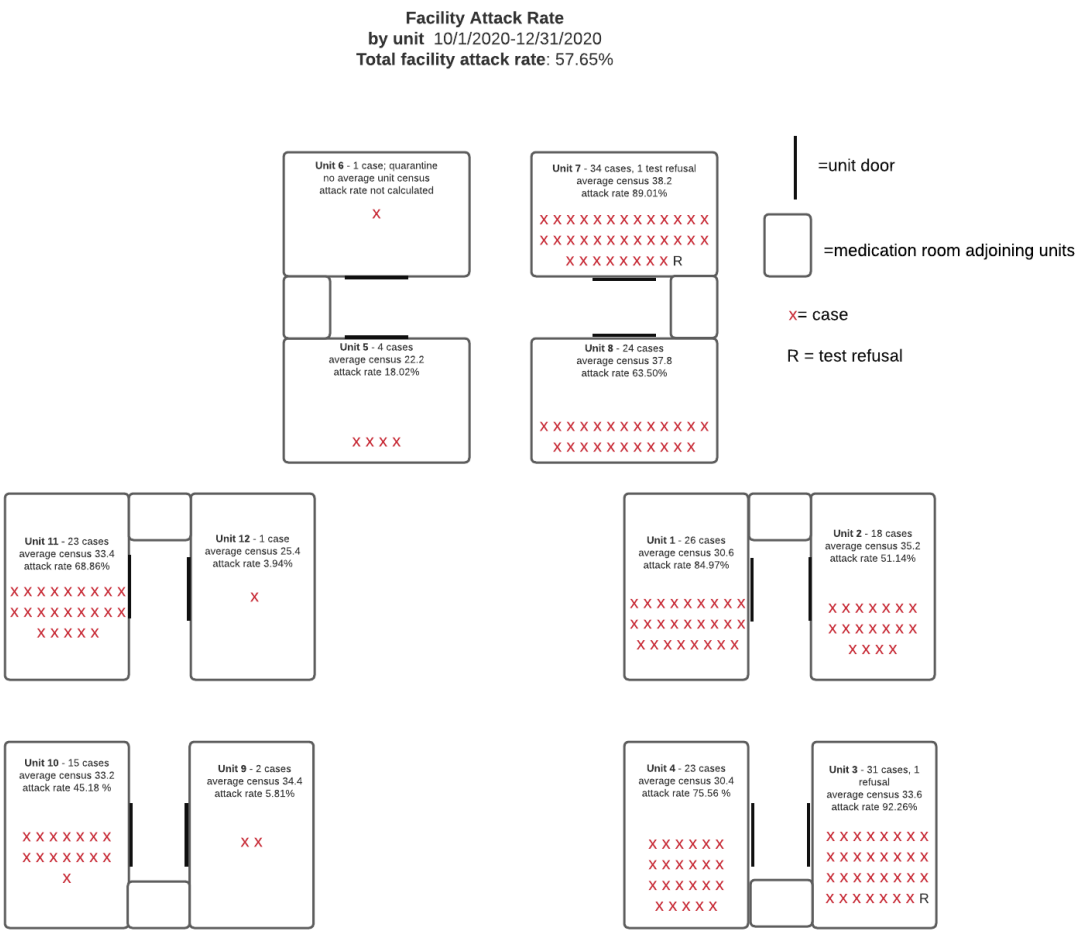


Figure 3. General configuration of study facility's primary living units. Not to scale. Additional features (classrooms, store, gym, etc.) are not featured here.

Just over six percent (6.3%) of infected individuals required inpatient hospital care due to COVID-19 during the study period. Hospitalized residents included 13 people from Units 1, 3, 4, 7, 8, and 11. There were three COVID-19 related deaths during the study period. The case fatality rate at this facility during this study was 1.4%. Deaths occurred on November 18, December 16, and December 24, 2020. All deaths occurred during special hospitalizations. Deaths occurred among residents from Units 2, 3, and 8.

Discussion

This study is unique because it offers data from a post-carceral secured behavioral rehabilitation facility. To the best of our knowledge, this is the only report of findings in a post-carceral secured environment, adding important results to what is currently known regarding infection control in secure facilities. There were no studies in the literature review that provided direct comparisons. COVID-19 poses unique challenges for secured congregate settings, as they cannot be shut down (Sims et al., 2021). Despite policy and procedures to mitigate the spread of

SARS-CoV-2, the infection rate in this congregate setting increased significantly during the last third of the study period. Policy changes occurred in response to increased and decreased facility cases. There were barriers to staff usage of PPE, which were eventually resolved. Ultimately, a rise in cases at the end of November precipitated significantly restricted movement within the facility. Moreover, the facility's primary function – behavioral rehabilitation – was hampered during the pandemic due to being unable to hold regular group therapy sessions. During the episodes of restricted movement, residents were confined to living units but were never limited to individual rooms. Such confinement may have slowed the spread of disease but would have constituted a violation of resident rights and institutional mission.

The percent positivity rate calculated for this study was relatively low, from 0.05%-4.34%. Two hundred five total cases occurred in the three-month study period, for a facility attack rate of 57.56%. This attack rate is similar to that described in a larger setting by Lewis et al. (2021), in which 1,368 (52%) of 2,632 inmates were ultimately infected during a correctional facility outbreak, despite prompt isolation and activity limitations. In a review of the Department of Corrections data, Saloner et al. (2020) reported a case rate among federal and state prisoners of 587 per 100,000. This study's crude rate was calculated significantly higher at 58/100. Toblin et al. (2021) report in a study of the Federal Bureau of Prisons, that in facilities testing ≥ 85% of inmates, the combined infection fatality rate was 0.8% and ranged from 0.0%-3.0%. The study facility case fatality rate was 1.4% (n=3). In this study, 13 residents required special hospitalization during the study period. Hospitalized residents require at least two security staff members 24 hours per day, which placed significant staffing strain on the security department during the pandemic.

Adherence to infection control guidelines is surmised to have contributed to the low number of infections on three living units. Promoting resident compliance with infection control practices can be particularly challenging in a behavioral health setting. It is particularly important, however, because individuals with mental health diagnoses are more likely to develop severe COVID-19 (CDC, 2021b).

A 2021 CDC summary indicates that the spread of SARS-CoV-2 via contaminated surfaces (fomite transmission) is less likely, with official modes of transmission listed as "inhalation of virus, deposition of virus on exposed mucous membranes, and touching mucous membranes with soiled hands contaminated with virus" (CDC, 2021a). However, correctional facilities and similar congregate settings are given guidance for "enhanced cleaning and disinfecting practices" due to difficulty in practicing social distancing in small spaces; employees, and inmates sharing space, and the higher rate of chronic disease in the incarcerated population (NIOSH, 2021). This includes routine disinfection of shared workspaces and equipment, which the study facility observed.

In addition to usual infection control measures, hazard pay was offered to employees working on infected units, as recommended in prior studies. As in other institutions, accommodations were also made for residents due to restricted visitation (Novinsky et al., 2020).

Limitations

This study has significant limitations. The study facility is unique, and there was no literature available for exact comparison. The literature review was completed with other congregate settings, such as nursing homes and correctional facilities. Correctional facilities were often used as a reference point, as this facility is secure. The data collected did not cover the entire late 2020 through early 2021 outbreak period. No cases were counted after December

31, 2020, which may have changed case counts and fatality rates. There was no feasible way to measure a test over test percent positivity rate for the entire study period. The total number of tests completed per day was not available for the mass test dates. Staff's infections were not included, so the study cannot ascertain a relationship between staff and resident infections.

Age, race, and other demographic information was not included in this study, though it would be helpful in further discerning morbidity and mortality from COVID-19 in this and similar populations. Resident and staff perspectives were not included in this study but may provide beneficial insight into the effects of COVID-19 in similar settings. Despite these limitations, this study makes new contributions to the literature, and there are important and applicable implications.

Conclusion

COVID-19 infections placed significant strain on the study facility as administrators attempted to balance rehabilitation requirements with infection control. SARS-CoV-2 spreads quickly in congregate settings such as prisons, where social distancing is not possible, and congregate living facilities have the potential to overwhelm staff and local healthcare resources (Wetzel & Davis, 2020). This facility responded with sustained and flexible infection control measures while attempting to maintain rehabilitative services. Despite this, there were a significant number of cases, special hospitalizations, and deaths.

The facility crude rate was calculated notably higher at 58/100 than the Department of Corrections rate, as noted by Saloner et al. (2020). Virtually every resident would eventually become infected, given this rate, without vaccination which was not available at this time. As with other studies, more readily available data (such as the number of tests performed daily) is recommended (Gibson, 2020; Novinsky et al., 2020; Sun et al., 2020, Yi et al., 2020). It is recognized that this facility, like other congregate settings affected by COVID-19, improvised infection control measures with very limited knowledge, although data collection and reporting improved over the course of the pandemic. As the pandemic continues, administrators of congregate settings may use this study's findings to inform current infection control efforts. Due to variation in the attack rate between units, further research regarding uptake of infection control measures by residents in secured settings is recommended, as is standardization of data collection and reporting for secure settings. The facility necessarily limited rehabilitative services (such as group therapy) to stop the spread of COVID-19. Further research is recommended to identify measures to maintain core rehabilitation services in a secured setting during an infectious disease outbreak.

Conflicts of Interest and Source of Funding: None declared.

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