COVID-19 Case Rates After Surveillance and Vaccinations in a Statewide Psychiatric Hospital System

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Individuals with serious mental illness are particularly vulnerable to COVID-19. The New York State (NYS) Office of Mental Health implemented patient and staff rapid testing, quarantining, and vaccination to limit COVID-19 spread in 23 state-operated psychiatric hospitals between November 2020 and February 2021. COVID-19 infection rates in inpatients and staff decreased by 96% and 71%, respectively, and the NYS population case rate decreased by 6%. Repeated COVID-19 testing and vaccination should be priority interventions for state-operated psychiatric hospitals. (*Am J Public Health*. 2021;111(10): 1780–1783. https://doi.org/10.2105/AJPH.2021.306444)

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Individuals with serious mental illness are especially vulnerable to COVID-19. We report results from a coordinated COVID-19 infection control program involving testing and vaccination that was implemented in 23 state psychiatric hospitals operated by the New York State (NYS) Office of Mental Health (OMH).

INTERVENTION

The intervention was designed to limit the spread of COVID-19 in a statewide inpatient psychiatric hospital system during the second surge of the virus in the state in fall and winter of 2020–2021. The intervention included (1) rapid antigen testing for all patients and staff either once a week (if there were low community transmission rates and no current positive staff or patients) or twice a week (if there were high community transmission rates or any positive staff or patients) with quarantining of positive individuals, and (2) a system-wide vaccination campaign.

PLACE AND TIME

The intervention occurred in the 23 OMH state-operated psychiatric hospitals of NYS. Testing began on December 1, 2020. The vaccination campaign began in the last week of December 2020, and 8943 individuals (63.2% of eligible patients and 49.4% of eligible staff) received an initial dose of either the Pfizer-BioNTech or the Moderna COVID-19 vaccine between January 1, 2021, and January 15, 2021.

PERSON

The population targeted by this intervention included patients and staff in 23 state psychiatric hospitals operated by OMH. The hospitals employ nearly 13 000 staff and care for approximately 3500 patients each day.

PURPOSE

The morbidity and mortality burden of COVID-19 has been borne disproportionately by adults in congregate settings.[1] Controlling COVID-19 spread in confined populations is a public health priority. A US Air Force base evaluation demonstrated the effectiveness of a screening, quarantining, and close monitoring program in controlling COVID-19 spread.[2] Distinctive characteristics of psychiatric inpatients, including cognitive and behavioral challenges that may lower levels of adherence to vaccination and hygienic recommendations, can complicate infection prevention and control in these particular institutions.

Psychiatric hospitals have historically been associated with outbreaks of

respiratory tract infections.[3] Compared with medical inpatients, psychiatric inpatients tend to have fewer medical comorbidities and are less often immune compromised. However, they are typically ambulatory and may move about freely, coming into close contact with other patients and staff. These characteristics make psychiatric inpatients vulnerable to infectious agents circulating in the community. In addition, freestanding psychiatric facilities not affiliated with general hospitals may not have access to infectious disease expertise and so may rely more on state or local health or mental health departments for infection control expertise and guidance.

IMPLEMENTATION

On December 1, 2020, shortly after Abbott Lab's BinaxNOW COVID-19 Antigen Test became available, OMH required all 23 state-operated hospitals to offer voluntary rapid antigen testing to all staff and patients. Department supervisors at every hospital oriented their staff to testing procedures, identified staff on a daily basis for testing, and monitored staff participation. Hospital attending physicians and infection control staff identified patients who would also be offered rapid testing each day.

Starting January 1, 2021, Pfizer-BioNTech and Moderna COVID-19 vaccines were made available to all OMH inpatients and staff with patient care responsibilities on a voluntary basis. OMH distributed informational materials and offered educational sessions regarding the vaccine. Vaccinations were not mandated. Attending physicians explained the vaccine to patients, obtained consent, and ordered vaccines to be administered by nurses on inpatient units. Staff received vaccines in clinics at each of the 23 hospitals.

EVALUATION

Case rates for OMH residential and inpatients, OMH staff, and NYS residents were calculated from November 16, 2020 through February 16, 2021 from a COVID-19 registry developed by OMH as well as publicly available data on COVID-19 infections in the overall NYS population. An interrupted times series analysis estimated the associations between testing (December 2020) and vaccination (January 2021) campaigns with changes in infection rates and whether the changes differed between OMH staff, patients, and the overall NYS population.

Nearly 5000 patients with serious mental illnesses were treated in the statewide psychiatric hospital network from November 2020 through February 2021. Figure 1 presents daily new COVID-19 cases rates (per 1000 persons) and rate changes from November 16, 2020, through February 16, 2021. There were 337 COVID-19 patient cases and 730 staff cases from November 16, 2020 to February 16, 2021, accounting, respectively, for 7.5% and 5.7% of patients and staff. From November 16 to December 1, 2020, new COVID-19 cases rapidly increased. On December 1, when rapid testing started, the daily case rate was 2.02 for patients, 0.84 for staff, and 0.42 for state residents.

By January 1, 2021, a month after widespread rapid antigen testing began, the case rate had decreased by 60% among patients to 0.81, decreased by 10% among staff to 0.76, and increased by 65% to 0.69 among state residents. The decrease in OMH patients and staff continued throughout January after the vaccine distribution scale-up, down 89% in patients to 0.23 and down 71% to 0.24 in staff on February 1, 2021, compared with December 1, 2020. Meanwhile, in NYS, the overall daily case rates remained higher on February 1 at 0.52 cases per

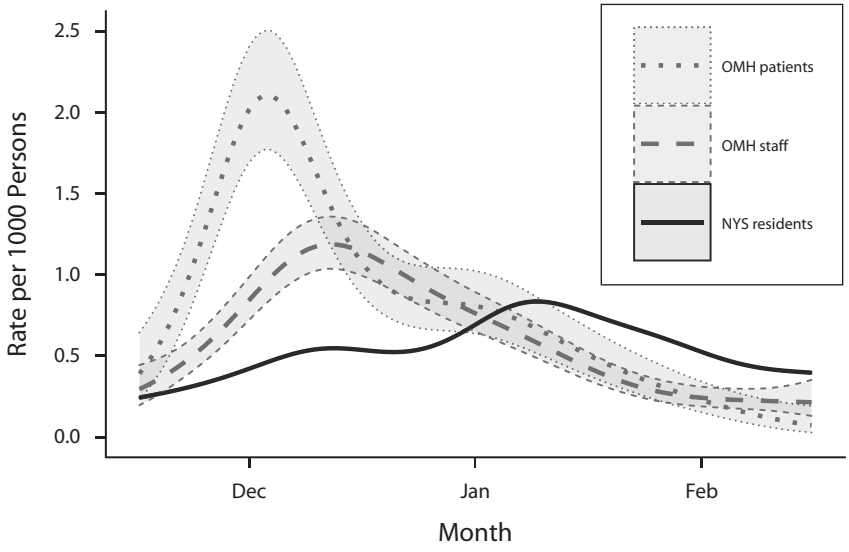

FIGURE 1— New COVID-19 Cases (Rate per 1000 persons) and Case Rate Changes: New York, NY, November 16, 2020–February 16, 2021.

Note. NYS = New York State; OMH = New York State Office of Mental Health.

1000 residents. Case rates in the OMH system declined significantly two weeks after the testing protocols were implemented, before the vaccination campaign began; these rate changes suggest that the testing and quarantine protocols led to a decrease in the transmission of COVID-19 independent of the vaccinations, which did not start until January 1, 2021. During the second COVID-19 surge in NYS, five patients in the OMH-operated psychiatric hospitals were confirmed to have died from COVID-19 illness compared with 44 in the spring 2020 surge.

Results must be interpreted with caution because of differences in testing between the OMH system and the NYS population: because testing in NYS was voluntary, there is a possibility that selection bias introduced error into the statewide COVID-19 prevalence estimation. Another potential limitation is our inability to separate the independent effects of the testing and vaccination campaigns once both were in effect in January 2021. The plateau in OMH patient case rates in the last week of December 2020, followed by the subsequent decrease in case rates two weeks after the vaccination campaign began, suggests that both interventions contributed to the decline in cases.

ADVERSE EFFECTS

There were no adverse effects or unintended consequences associated with this intervention.

SUSTAINABILITY

It is desirable for these interventions to continue. Considerations related to sustainability include the cost of staff and materials for implementing rapid testing, quarantining, and vaccination as well as ongoing concerns about the availability of vaccines. The most significant barrier to the intervention will be continued vaccine hesitancy, throughout both the OMH system and the community at large. Educational and outreach efforts are ongoing to increase vaccine acceptance.

PUBLIC HEALTH SIGNIFICANCE

Worldwide, the rate of psychiatric inpatient hospitalization averages 29.3 per 100 000 population with a maximum of 200.3 beds per 100 000 population.[4] Patients and staff in these psychiatric hospitals are particularly vulnerable to the spread of the COVID-19.[5,6] The importance of curtailing the spread of COVID-19 in psychiatric populations is underscored by recent evidence that individuals with schizophrenia may be particularly vulnerable to COVID-19-related mortality.[7] It is important to use evidence-based public health strategies to limit the spread of infections in these settings. These findings support public health interventions that include testing and quarantining as well as vaccination campaigns, which may help limit spread in congregate settings and the general population as the pandemic continues. AJPH

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CONTRIBUTORS

T. E. Smith conceptualized the study; he had full access to all study data and takes responsibility for the data integrity. T. E. Smith and M. M. Wall assisted in drafting the article. I. T. Rodgers assisted with data collection and analyses and drafted the article. D. J. Silverman and S. R. Dreslin collected the data. M. Olfson and L. B. Dixon assisted with the conceptualization of the study and analytic plan. M. M. Wall conducted all analyses and takes responsibility for the data analyses. All authors provided critical review of the final article.

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CONFLICTS OF INTEREST

The authors report no conflicts of interest.

HUMAN PARTICIPANT PROTECTION

The New York State Office of Mental Health institutional review board deemed this study not human participants research.

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