

Incidence and transmission of SARS-CoV-2 in US child care centers after COVID-19 vaccines ^[1]

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Abstract

Importance

SARS-CoV-2 surveillance studies in US child care centers (CCCs) in the post-COVID-19 vaccine era are needed to provide information on incidence and transmission in this setting.

Objective

To characterize SARS-CoV-2 incidence and transmission in children attending CCCs (students) and their child care providers (CCPs) and household contacts.

Design, Setting, and Participants

This prospective surveillance cohort study was conducted from April 22, 2021, through March 31, 2022, and included 11 CCCs in 2 cities. A subset (surveillance group) of CCPs and students participated in active surveillance (weekly reverse transcription-polymerase chain reaction [RT-PCR] swabs, symptom diaries, and optional baseline and end-of-study SARS-CoV-2 serologic testing), as well as all household contacts of surveillance students. Child care center directors reported weekly deidentified self-reported COVID-19 cases from all CCPs and students (self-report group).

Exposure

SARS-CoV-2 infection in CCC students.

Main Outcomes and Measures

SARS-CoV-2 incidence, secondary attack rates, and transmission patterns were determined from diary entries, self-reports to CCC directors, and case logs. Incidence rate ratios were measured using Poisson regression clustering on centers with a random intercept and unstructured matrix.

Results

From a total population of 1154 students and 402 CCPs who self-reported cases to center directors, 83 students (7.2%; mean [SD] age, 3.86 [1.64] years; 55 male [66%]), their 134 household contacts (118 adults [mean (SD) age, 38.39 (5.07) years; 62 female (53%)], 16 children [mean (SD) age, 4.73 (3.37) years; 8 female (50%)]), and 21 CCPs (5.2%; mean [SD] age, 38.5 [12.9] years; 18 female [86%]) participated in weekly active surveillance. There were 154 student cases (13%) and 87 CCP cases (22%), as defined by positive SARS-CoV-2 RT-PCR or home antigen results. Surveillance students had a higher incidence rate than self-report students (incidence rate ratio, 1.9; 95% CI, 1.1-3.3; $P = .01$). Students were more likely than CCPs to have asymptomatic infection (34% vs 8%, $P < .001$). The CCC secondary attack rate was 2.7% to 3.0%, with the upper range representing possible but not definite secondary cases. Whether the index case was a student or CCP, transmission within the CCC was not significantly different. Household cumulative incidence was 20.5%, with no significant difference in incidence rate ratio between adults and children. Household secondary attack rates were 50% for children and 67% for adults. Of 30 household cases, only 5 (17%) represented secondary infections caused by 3 students who acquired SARS-CoV-2 from their CCC. Pre- and poststudy seroprevalence rates were 3% and 22%, respectively, with 90% concordance with antigen or RT-PCR results.

Conclusions and Relevance

In this study of SARS-CoV-2 incidence and transmission in CCCs and students' households, transmission within CCCs and from children infected at CCCs into households was low. These findings suggest that current testing and exclusion recommendations for SARS-CoV-2 in

CCCs should be aligned with those for other respiratory viruses with similar morbidity and greater transmission to households.

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