OBSERVATIONS: BRIEF RESEARCH REPORTS

Screening for SARS-CoV-2 Antigen Before a Live Indoor Music Concert: An Observational Study

Background: Indoor mass-gathering events have been banned since the beginning of the COVID-19 pandemic because of high risk for spread of SARS-CoV-2. A growing body of evidence supports point-of-care screening of potentially contagious individuals with antigen-detecting rapid diagnostic tests (Ag-RDTs) to create safe environments during a COVID-19 outbreak (1).

In a previous randomized controlled trial, we provided preliminary evidence on the effectiveness of point-of-care screening with Ag-RDTs, mask-wearing, and air ventilation to prevent SARS-CoV-2 transmission during an indoor mass-gathering event with 465 participants (2).

Objective: To investigate transmission events during an indoor live music concert with 5000 individuals and the containment measures previously tested.

Methods and Findings: The concert was held in the Palau Sant Jordi stadium (Barcelona, Spain) on the afternoon of 27 March 2021. On the day of the event (from 8:00 a.m. to 3:00 p.m.), a team of 74 nurses performed Ag-RDTs (Panbio COVID-19 Ag Rapid Test) for all attendees at 3 screening sites. The use of filtering facepiece 2 masks (which are able to filter at least 94% of airborne particles) was mandatory during the entire event. Singing and dancing were allowed, and no physical distancing was required. All attendees were located on the central floor of the stadium, which was at full capacity, and grouped into 3 delimited areas; the stadium stands, with a capacity for 13 000 people, were not occupied. Inner ventilation was optimized to provide 6 complete (100%) air changes per hour.

During Ag-RDT screening, written consents were obtained for postevent follow-up via electronic health records or phone calls, in collaboration with the Catalan Public Health Department, which provides universal health care coverage to the entire population and set up a centralized epidemiologic surveillance system for polymerase chain reaction (PCR) confirmation of suspected cases and contact tracing during the pandemic.

The study was approved by the Ethics and Clinical Research Committee of the Hospital Universitari Germans Trias in Badalona, Spain (ClinicalTrials.gov: NCT04824625). The study sponsor had no role in the study design, data collection, data analysis, data interpretation, or writing of the report.

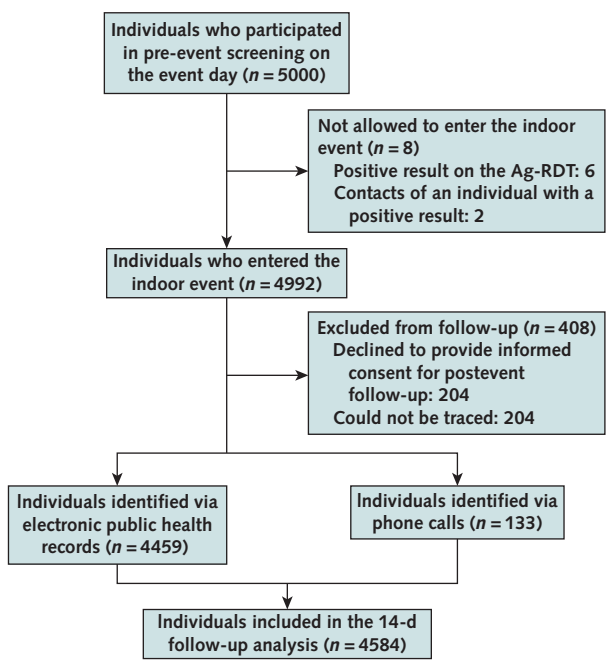
By the time of the event, the age-standardized 14-day cumulative incidence rate in Barcelona was 259.5 cases per 100 000 inhabitants, and the country-level vaccination rate for COVID-19 (2 doses) was 6.3%, mainly administered to nursing home residents, older adults, and health care workers (3). Travel in and out of the city area was constrained to essential activities.

Of the 5000 Ag-RDT–screened individuals, 6 (prevalence, 120 cases per 100 000 persons) tested positive and were not allowed to enter the concert, as well as 2 of their close contacts despite testing negative (**Figure**). The final analysis included 4584 attendees. Six attendees (1 man and 5 woman; median age, 36 years [range, 27 to 46 years]), none of whom were vaccinated, were diagnosed with COVID-19 within the 2 weeks after the concert (median, 8.5 days [range, 4 to 12 days]); all of these persons had mild symptoms (14-day cumulative incidence, 130.9 cases per 100 000 persons). Three of them had been located in the front-right area of the stadium and 3 in the front left. Of these 6 persons, 3 were identified in contact-tracing studies of known index cases who had not attended the concert; therefore, their contagion was unlikely to occur during the event. One woman who participated in the event was oligosymptomatic, though she tested negative in the pre-event Ag-RDT screening and again 48 hours after the event; 4 days after the concert, COVID-19 diagnosis was confirmed by PCR testing. Therefore, she presumably attended the event during the incubation period (4). The transmission source of the 2 remaining cases could not be identified.

Discussion: The pragmatic approach of the study precludes direct comparisons between the incidence rate observed among attendees and that of the background population. Epidemiologic information in public health records, used as an information source for both attendees and the background population, is built primarily from contact-tracing studies and may overlook asymptomatic cases, which may account for up to 40% of COVID-19 cases (5). Despite these limitations, our data indicate that no remarkable transmission events occurred during the concert and support that Ag-RDT may be suitable for ruling out individuals with transmission risk at the time of testing rather than identifying infected individuals (1).

Our results build on our previously reported clinical trial data (2) and suggest that the implementation of same-day Ag-RDT screening, use of face masks, and improved ventilation can prevent high rates of SARS-CoV-2 transmission in indoor mass-gathering live concerts without physical distancing. These findings must be read in the context of a case study conducted in a community with low vaccination rates and a moderate infection rate. Nevertheless, they are a key step for creating safe environments in not only live music events but also other mass-gathering indoor events.

Figure. Study flow diagram.



Ag-RDT = antigen-detecting rapid diagnostic test.

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See Also: Editorial comment.

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Data Sharing Statement: The following data will be made available with publication: deidentified participant data (contact Jessica Toro; e-mail, jtoro@flsida.org). The following supporting documents will be made available with publication: statistical/analytic code and informed consent form (contact Jessica Toro; e-mail, jtoro@flsida.org). These data will be made available to anyone requesting them for Excel databases and after approval of a proposal with a signed data access agreement with no restrictions.

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