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A SARS-CoV-2 omicron (B.1.1.529) variant outbreak in a primary school in Geneva, Switzerland

The role of primary-school children in community circulation of SARS-CoV-2 remains unclear, and this is particularly true for the highly transmissible omicron (B.1.1.529) variant, which has a high potential for immune escape, increasing the likelihood to infect or reinfect vaccinated family members. We investigated a SARS-CoV-2 outbreak in a primary school in Geneva, Switzerland, as part of a longitudinal, prospective, school-class-based surveillance study (SEROCoV-Schools). Detailed methods are in the appendix (pp 1–2). Briefly, children (aged 3–7 years), teachers, and school staff from four classes in the primary school (classes A–D) were invited to participate in the surveillance study. When a participant tested positive, we prospectively investigated the transmission of SARS-CoV-2 in the school and in the household.

The first case (class C) of SARS-CoV-2 infection with the omicron variant was notified to our team on Jan 11, 2022, which was the day after the start of the school term after the winter vacation, referred to as day 0. Children and staff members were tested for SARS-CoV-2 infection via RT-PCR on oropharyngeal swabs twice by our team, or PCR-confirmed infection, or both, before the beginning of the omicron outbreak in January, 2022. Among those, 17 were tested during the outbreak and five (29%) of 17 were infected. Among the children without indication of previous infection or vaccination who were tested, 20 (50%) of 40 were infected.

Five (50%) of ten teachers and one (20%) of five non-teaching staff members at the school tested positive during the omicron outbreak. Two (13%) of 15 staff members were not vaccinated against COVID-19, and both tested positive.

We also investigated the introduction of SARS-CoV-2 infections in 24 households of children who tested positive. 52 household members were tested once or twice within the week after their child or sibling tested positive (appendix p 3). Infections with the SARS-CoV-2 omicron variant were found in 15 (63%) of 24 households and 25 (48%) of 52 investigated household members (which increased to 27 [50%] of 54 if including probably cases), a household cumulative infection incidence that was similar to the findings of another report from South Korea.4 42 (91%) of 46 parents included were vaccinated, of whom 32 (76%) had received a booster. After excluding those who tested positive just before the outbreak and those who were not tested, the cumulative incidence of infection among those who had received a booster vaccination was 13 (43%) of 30, among those who had received one or two doses of vaccine was two (33%) of six, and among those who were unvaccinated was two (67%) of three, supporting the idea that this variant is highly transmissible even among fully vaccinated people.5

Most infections were symptomatic, with 25 (81%) of 31 children and siblings and 19 (86%) of 22 adults (parents, teachers, and non-teaching staff members combined) reporting symptoms. Four (100%) of four adults who were unvaccinated, three (75%) of four adults who were vaccinated...
This study was approved by the ethics committee of the Canton of Geneva (Project ID 2020-02957). All parents and teachers were informed about the study and gave written informed consent, while children gave verbal assent to participate. The SEROCov-Schools study was supported by the Federal Office of Public Health, the Private Foundation of the Geneva University Hospitals, the Fondation des Grangenttes, the Center for Emerging Viral Diseases, and a SNF NRP (National Research Program) 78 COVID-19 Grant 19B412 (to SJM and IE). We declare no competing interests. SEROCov-Schools Study Group members are listed in the appendix (p S).

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