



# SARS-CoV-2 Screening Testing in Schools: A Comparison of School- Vs. Home-Based Collection Methods

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## INTRODUCTION

Effective safety measures for in-person education during the COVID-19 pandemic have remained a public health priority. SARS-CoV-2 screening testing in schools can reduce transmission [1] and until August 2022, the Centers for Disease Control and Prevention recommended routine screening testing when community COVID-19 levels were moderate or high [2]. School testing programs have generally relied on on-site or home testing models, rarely both. We describe testing participation in a weekly SARS-CoV-2 reverse transcription-polymerase chain reaction (RT-PCR) screening program using home- or school-based nasal swab collection for kindergarten-2nd grade students in a Washington State school district in 2021 during a period of moderate to high community transmission levels.

## METHODS

This study offered weekly voluntary SARS-CoV-2 RT-PCR screening testing from February 24–June 18, 2021. Kindergarten-2<sup>nd</sup> grade students present in school at least once weekly were eligible (see [Supplementary Appendix A](#) for detailed Methods). After consent, parents of students at eight schools selected home- or school-based swab collection; students at two schools were only offered home-based swab collection ([Supplementary Appendix B](#)). Anterior nares swabs (US Cotton #3) [3] were collected from participants weekly at their home by parents or at school by research

personnel. RT-PCR testing for SARS-CoV-2 was performed at the Northwest Genomics Center, Seattle, Washington. Within 12–72 hours, participants could access SARS-CoV-2 results on a secure website using personal identifiers and specimen barcodes. We used descriptive statistics using R software to characterize participants and describe testing behavior. Testing participation was calculated as the proportion of tests collected divided by tests expected from all enrolled participants.

## RESULTS

We enrolled 304 students from 10 schools, 17.7% of eligible students in the district ([Supplementary Appendix C](#)). Of enrolled students, 287 students (94.4%) participated in testing with a median of 14.0 (IQR 11.0–15.0) swabs collected. For 264 students offered home- or school-based collection, 176 (66.7%) parents selected school-based collection whereas 88 (33.3%) parents selected home-based collection ([Supplementary Appendix D](#)).

During the study, weekly testing participation was highest for students whose parents selected school-based collection (median 95%, range 92–100%) ([Figure 1](#)). Testing participation for students whose parents selected home-based collection (median 70%, range 56–79%) and students enrolled in schools that only offered home-based collection (median 59%, range 41–83%) decreased during the study.

Of 3514 specimens collected, 3487 (99.2%) were tested for SARS-CoV-2. Untested specimens were largely due to improper labeling of specimen tubes by participants. Two specimens (0.06%), both collected from asymptomatic students—one through home-based collection and the other through school-based collection—tested positive for SARS-CoV-2. There was no detection of in-school SARS-CoV-2 transmission through school-conducted contact tracing (personal communication, Snohomish School District). The median time from specimen receipt by the laboratory to reporting of results was 27.5 hours (IQR 25.7 – 29.6).

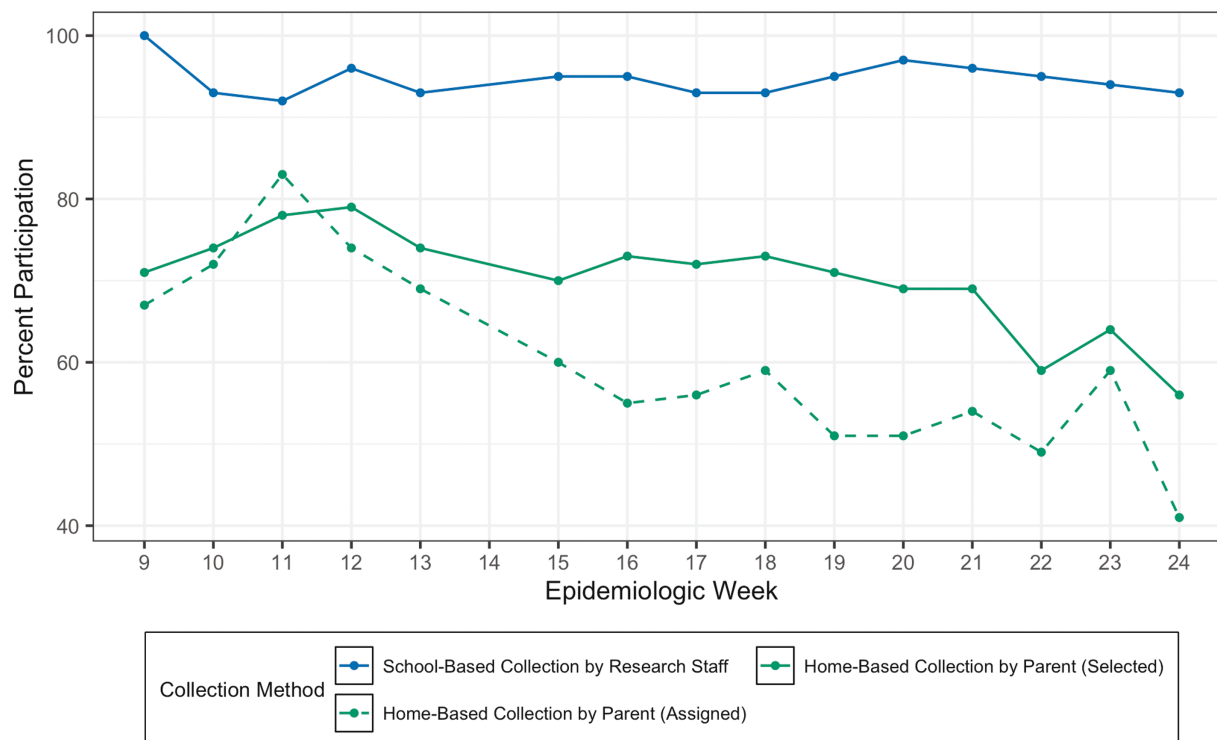
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**Figure 1.** Weekly student testing participation by collection method. Testing participation was determined by participation in specimen collection and/or kit return. Percent participation was the proportion of tests by collection method as defined at enrollment collected over expected number of tests from all enrolled participants of the collection method to date. Epidemiologic weeks were defined using CDC Epidemiologic Week definitions. Specimen collection was paused during Epidemiologic Week 14 for the district’s Spring Break. Selected Collection: Parents of students at eight schools selected home- or school-based swab collection. Assigned Collection: Students at two schools were only offered home-based swab collection.

## DISCUSSION

In this unique SARS-CoV-2 screening study with home- and school-based nasal swab collection, school-based swab collection had the highest weekly testing participation. More parents chose this collection method over home-based swab collection. For long-term screening programs, school-based collection may be desirable for testing retention and parental convenience. Home-based collection was effectively included in our school testing program with few untestable specimens returned. Home-based screening can easily be transitioned to diagnostic testing for symptomatic and exposed individuals. With wide availability of rapid SARS-CoV-2 antigen tests, home testing components may reduce costs of screening testing programs. This risks waning parental participation over time, likely seen in our study due to the time burden of swab collection and return.

The low SARS-CoV-2 positivity in this study during moderate-high county-level transmission and widely documented Alpha variant circulation corroborates studies showing lower SARS-CoV-2 transmission levels in schools implementing prevention strategies (e.g., mask wearing, physical distancing) than in the community [4]. The low positivity supports studies which have shown benefits in transmission-related outcomes [1]

and in our study community, provided reassurance to school staff and families.

Limitations include that the enrolled population did not constitute the majority in any school and may have been subject to selection bias: participant-reported incomes were higher than median county incomes [5]. RT-PCR testing through a commercial laboratory and the use of school staff may significantly increase costs, which may be a barrier to implementing this program in other U.S. school districts. Societal cost savings (e.g., maintaining parental productivity) may outweigh the costs of a testing program [6]; cost-benefit analyses comparing multiple collection methods and tests would help determine financial feasibility. At the time of publication, with widespread home test availability but declining concern for SARS-CoV-2, a flexible collection model as we have described may be an important option for schools.

### Supplementary Data

Supplementary materials are available at the Journal of The Pediatric Infectious Diseases Society online (<http://jpid.oxfordjournals.org>).

### Notes

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**Disclaimer.** The views expressed are those of the authors and do not necessarily reflect the official policy of the Centers for Disease Control and Prevention.

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conception and design though her death precluded her approval of the final manuscript or consent to journal submission.

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