

# SUPPORT FOR NASAL SELF-SWABBING IN CHILDREN FOR RESPIRATORY VIRUSES

The following studies validate the adequacy of both self-swabbing by children and parental swabbing of children for respiratory samples collected from the anterior nares.

The benefits of these approaches include less distress and greater comfort for children and lower risk of infection to health care workers during sample collection.

## ADEQUACY OF NASAL SELF-SWABBING FOR SARS-COV-2 TESTING IN CHILDREN

Jesse J. Waggoner, Miriam B. Vos, Erika A. Tyburski, Phuong-Vi Nguyen, Jessica M. Ingersoll, Candace Miller, Julie Sullivan, Mark Griffiths, Cheryl Stone, Macarthur Benoit, Laura Benedi, Brooke Seitter, Robert Jerris, Joshua M. Levy, Colleen S. Kraft, Sarah Farmer, Amanda Foster, Anna Wood, Adrianna L. Westbrook, Claudia R. Morris, Usha N. Sathian, William Heetderks, Li Li, Kristian Roth, Mary Barcus, Timothy Stenzel, Greg S. Martin, Wilbur A. Lam MARCH 9, 2022  
<https://www.medrxiv.org/content/10.1101/2022.03.07.22270699v1.full-text>

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**“Children, aged 4-14 years-old, can provide adequate AN specimens for SARS-CoV-2 detection...”**

### AIM

The goal of this study was to characterize the ability of school-aged children to self-collect adequate anterior nares (AN) swabs for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing.

### METHOD

From July to August 2021, 287 children, age 4-14 years-old, were prospectively enrolled in the Atlanta area. Symptomatic (n=197) and asymptomatic (n=90) children watched a short instructional video before providing a self-collected AN specimen. Health care workers (HCWs) then collected a second specimen, and useability was assessed by the child and HCW. Swabs were tested side-by-side for SARS-CoV-2. RNase P RNA detection was investigated as a measure of specimen adequacy.

### RESULTS

Among symptomatic children, 87/196 (44.4%) tested positive for SARS-CoV-2 by both self- and HCW-swab. Two children each were positive by self- or HCW-swab; one child had an invalid HCW-swab. Compared to HCW-swabs, self-collected swabs had 97.8% and 98.1% positive and negative percent agreements, respectively, and SARS-CoV-2 Ct values did not differ significantly between groups. Participants ≤8 years-old were less likely than those >8 to be rated as correctly completing self-collection, but SARS-CoV-2 detection did not differ. Based on RNase P RNA detection, 270/287 children (94.1%) provided adequate self-swabs versus 277/287 (96.5%) HCW-swabs (p=0.24) with no difference when stratified by age.

### CONCLUSIONS

Children, aged 4-14 years-old, can provide adequate AN specimens for SARS-CoV-2 detection when presented with age-appropriate instructional material, consisting of a video and a handout, at a single timepoint. These data support the use of self-collected anterior nasal swabs among school-age children for SARS-CoV-2 testing.

## FEASIBILITY OF SPECIMEN SELF-COLLECTION IN YOUNG CHILDREN UNDERGOING SARS-COV-2 SURVEILLANCE FOR IN-PERSON LEARNING

Jonathan Altamirano, MS1,2; Marcela Lopez, BA1; India G. Robinson, BS1; et al JAMA Netw Open. 2022;5(2):e2148988. doi:10.1001/jamanetworkopen.2021.48988 . FEBRUARY 17, 2022 <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2789128>

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**“Mastery of self-collected lower nasal swabs is possible for children 5 years and older.”**

### AIM

To assess whether young children can feasibly self-collect SARS-CoV-2 samples for surveillance testing over the course of an academic year.

### METHOD

The study was conducted at a K-8 school in California with 296 participants, of which 148 (50.0%) were boys and 148 (50.0%) were girls. Students were aged between 5 and 14 years of age and the median school grade was fourth grade. From September 2020 to March 2021, a total of 4203 samples were obtained from 221 students on a weekly basis, while data on error rates were collected. Anterior nares specimen self-collection was selected for surveillance as opposed to the more invasive nasopharyngeal swab. Clinical research staff provided all students with instructions for anterior nares specimen self-collection and observed them to ensure proper technique.

### FINDINGS

Errors occurred in 2.7% (n = 107; 95% CI, 2.2%-3.2%) of student encounters, with the highest rate occurring on the first day of testing (20 [10.2%]). There was an overall decrease in error rates over time.

Although error rates were initially high, they rapidly decreased and stabilized at around 3% within the first month of testing. This shows that students were able to master nasal swabbing techniques and that lower nasal swabbing is well-tolerated by children as young as 5 years. Between April and June 2021, 193 encounters were timed. The mean duration of each encounter was 70 seconds (95% CI, 66.4-73.7 seconds).

## CONCLUSIONS

Mastery of self-collected lower nasal swabs is possible for children 5 years and older. Testing duration can be condensed once students gain proficiency in testing procedures. Scalability for larger schools is possible if consideration is given to the resource-intensive nature of the testing and the setting's weather patterns.

# MASS SURVEILLANCE OF SARS-COV-2 UTILISING SELF-COLLECTION SWABS AND HIGH-THROUGHPUT LABORATORY TECHNIQUES: AN AUSTRALIAN CASE STUDY OF ASYMPTOMATIC YEAR 12 STUDENTS AT THE QUDOS BANK ARENA

Andrew Sargeant, Christopher Kot, Misha Hashmi, Dr Catherine Pitman, A/Prof Dominic Dwyer, Christopher Bourke, Vicki Pitsiavas, Stephen Parker, Laila Hassan, Hayley Keenan, Therese Atkins. Affiliations WSLHD, NSW Health, NSW Health Pathology NOVEMBER 10, 2021

► <https://www.pathology.health.nsw.gov.au/research-and-innovation/research-forum/christopher-kot>



**“Self-collection techniques are preferred, protect healthcare workers and improve result turnaround times.”**

## AIM

To determine whether SARS-CoV-2 self-collection and rapid RT-PCR testing could improve result turnaround times, aid in asymptomatic detection and improve testing compliance.

## METHOD

A total of 15,519 participants performed self-collection of a novel nasal swab (RhinoSwab). They were subsequently tested on a mobile laboratory platform combining a liquid handler (Myra) with a thermocycler (micPCR) and SARS-CoV-2 RT-PCR reagents. Roche Liat was implemented as a confirmation device.

## RESULTS

Self-collection averaged less than 5 minutes per collection. RT-PCR focusing on human genes revealed adequate human cell collection of 99.9% of collection. 2,533 Surveyed participants revealed:

- 91% found self-collection easy to perform.
- 1% reported discomfort.
- 75% preferred self-collection.

In total, 15,645 tests were performed, with 6 positive SARS-CoV-2 specimens. On average the time to reporting of a positive result was 3 hours and 25 minutes.

## CONCLUSIONS

Self-collection techniques are preferred, protect healthcare workers and improve result turnaround times.

# COLLECTION BY TRAINED PEDIATRICIANS OR PARENTS OF MID-TURBINATE NASAL FLOCKED SWABS FOR THE DETECTION OF INFLUENZA VIRUSES IN CHILDHOOD

Susanna Esposito, Claudio G Molteni, Cristina Daleno, Antonia Valzano, Claudia Tagliabue, Carlotta Galeone, Gregorio Milani, Emilio Fossali, Paola Marchisio & Nicola Principi. *Virology Journal* volume 7, Article number: 85 (2010) APRIL 30, 2010 ► <https://virology.biomedcentral.com/articles/10.1186/1743-422X-7-85>

**“Mid-turbinate nasal flocked swabs specifically designed for infants and children can be used by parents without reducing the influenza virus detection rate”**

Virology Journal



## METHOD

This study evaluated the efficiency of pediatric mid-turbinate nasal flocked swabs used by parents in 203 children aged 6 months to 5 years with signs and symptoms of respiratory disease.

Two nasal samples were collected from each child in a randomised sequence: one by a trained pediatrician and one by a parent.

## RESULTS

The real-time polymerase chain reaction influenza virus detection rates were similar in the samples collected using the two methods (Cohen's kappa = 0.86), as were the cycle threshold values. In comparison with the pediatrician-collected samples, the sensitivity and specificity of the parental collections were respectively 89.3% (95% confidence interval [CI]: 77.8-100%) and 97.7% (95% CI: 95.5-100%), and the positive and negative predictive values were respectively 86.2% (95% CI: 73.7-95.1%) and 98.2% (95% CI: 96.4-100%). The children were significantly more satisfied with the parental collections (median values ± standard deviation, 1.59 ± 0.55 vs 3.51 ± 0.36; p < 0.0001).

## CONCLUSIONS

These findings show that mid-turbinate nasal flocked swabs specifically designed for infants and children can be used by parents without reducing the influenza virus detection rate. Moreover, the direct involvement of parents significantly increases patient acceptance, thus simplifying collection and suggesting that this novel swab design should be considered for epidemiological surveys and vaccine efficacy studies.

Contact us to discuss how RHINOSWAB may help deliver a better sampling solution for your needs.  
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