

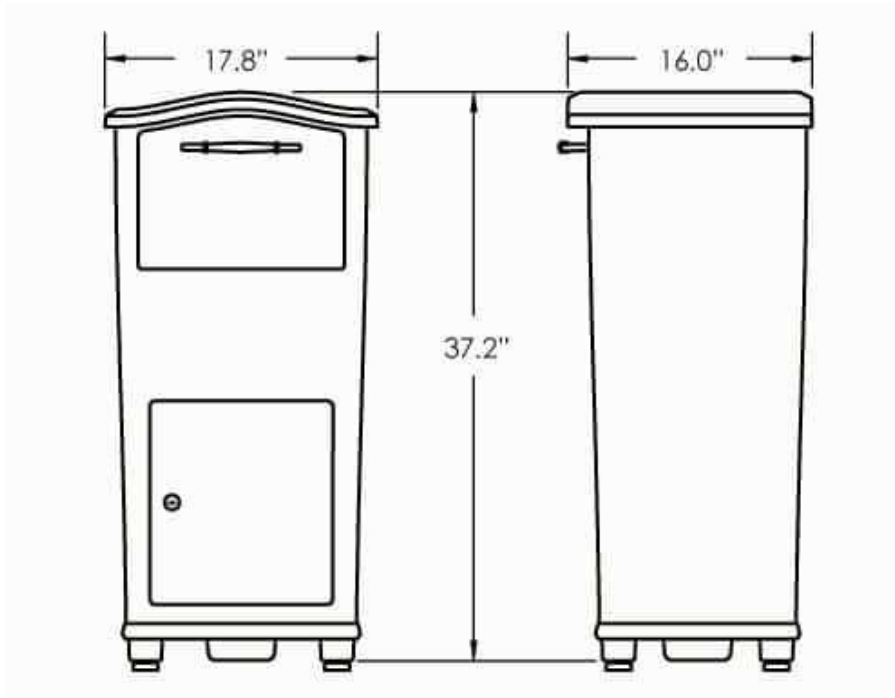
Evaluation of a novel university-based testing platform to increase access to SARS-CoV-2 testing during the COVID-19 pandemic in a cohort study

Supplementary Materials

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Supplementary Figure 1. Drop box containers for collection of unsupervised self-swabs: secure Elephantrunk (6900B-10) parcel drop containers located at several high-traffic areas on campus.



Supplementary Figure 2. Unsupervised swab kit instructions for registering the kit, self-swabbing, and returning a sample, front (left) and back (right).

UNIVERSITY of WASHINGTON

HUSKY CORONAVIRUS TESTING


POWERED BY THE SEATTLE FLU STUDY

Register your swab kit:





1. Use your cell phone to scan the QR code or visit seattleflu.org/uw/start.
2. Complete the *Eligibility Screener, Consent Form, and Enrollment Questionnaire*. The *Enrollment Questionnaire* will ask if you have a pre-positioned swab kit. Select "Yes".
3. You will then receive either a text or email (based on your indicated preference) with a link to register your kit. Follow the instructions and enter your barcode number.
4. After finishing the survey, place your completed swab in the bag, seal the bag and return it to a drop box. For drop box locations, visit seattleflu.org/uw.
5. You will receive an email or text with your barcode and instructions for how to view your results.

Swab instructions are on the back.



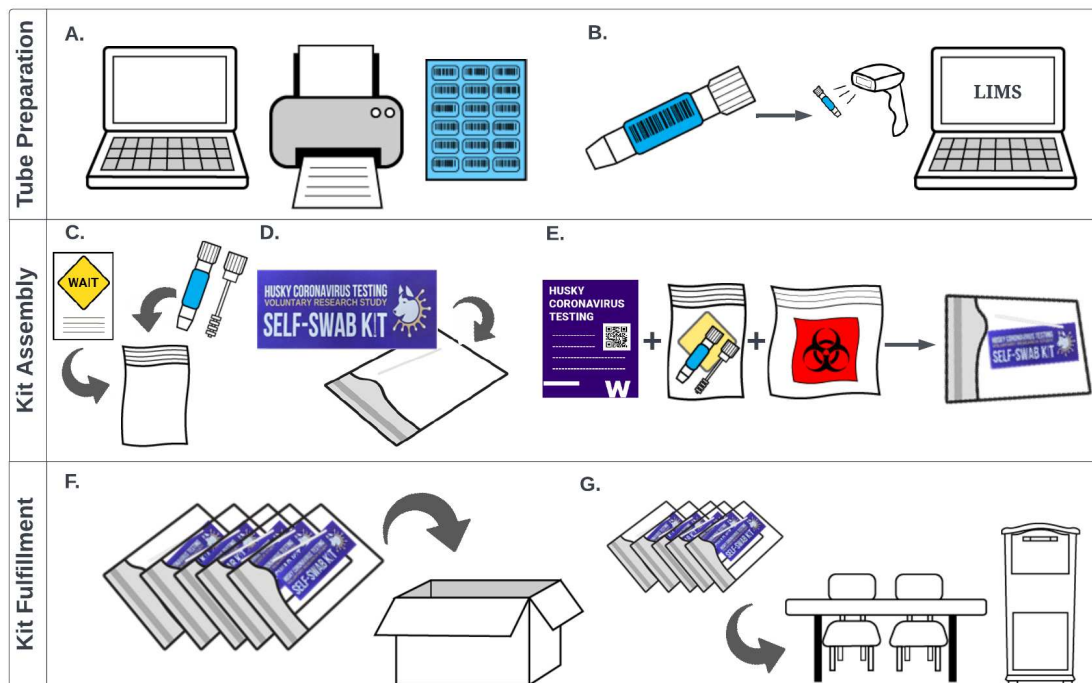


HOW TO COMPLETE YOUR SWAB SAMPLE:

1. Blow your nose and sanitize your hands.
2. Remove the small lid from the collection tube and discard.
3. Carefully remove the swab without touching the swab tip. Keep the tube in your hand while swabbing your nostrils.
4. Insert the tip of the swab into one nostril until you feel light pressure in your nose. The swab should be placed just inside your nostril.
5. Rotate the swab around the inside of the nostril three times. 
6. Gently slide the swab up and down against the inside of the nostril one time. 
7. Firmly hold the swab against the inside of the nostril for 10 seconds. 
8. **Repeat** steps 4-7 in the second nostril using the same swab. **Swabbing is complete.**
9. Carefully place the swab into the collection tube and screw the tube completely closed. Place the collection tube into the specimen bag and seal. 

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Supplementary Figure 3. Unsupervised self-swab kit assembly and distribution workflow. Unsupervised self-swab kits were created using an assembly line with stations for tube preparation, swab bag preparation, study branding, kit assembly, packaging, and storage. Unsupervised self-swab kits were created at a rate of 45 kits per hour with capacity to scale and a backlog of 10,000 kits was maintained in preparation of unanticipated increases in testing demand.



A. Unique eight-character barcode identifiers for linking participant and laboratory data are printed on Laser Cryo-Babies labels (LCRY-L4289).

B. Barcode labels are adhered to Matrix™ 1.0 mL ScrewTop Tubes (Thermo Fisher 3741) and scanned to be linked to Clinical Laboratory Improvement Amendments (CLIA) barcodes. Barcodes are entered into the Laboratory Inventory Management System (LIMS) for sample tracking.

C. Matrix™ collection tubes and RHINostic™ Automated Nasal Swabs (Rhinostics RH-S000001) in original sterile packaging from the manufacturer are placed in a 3" x 4" bags (ULINE S-1292) labeled with a yellow "WAIT" sticker to remind participants to register their kit online before self-swabbing.

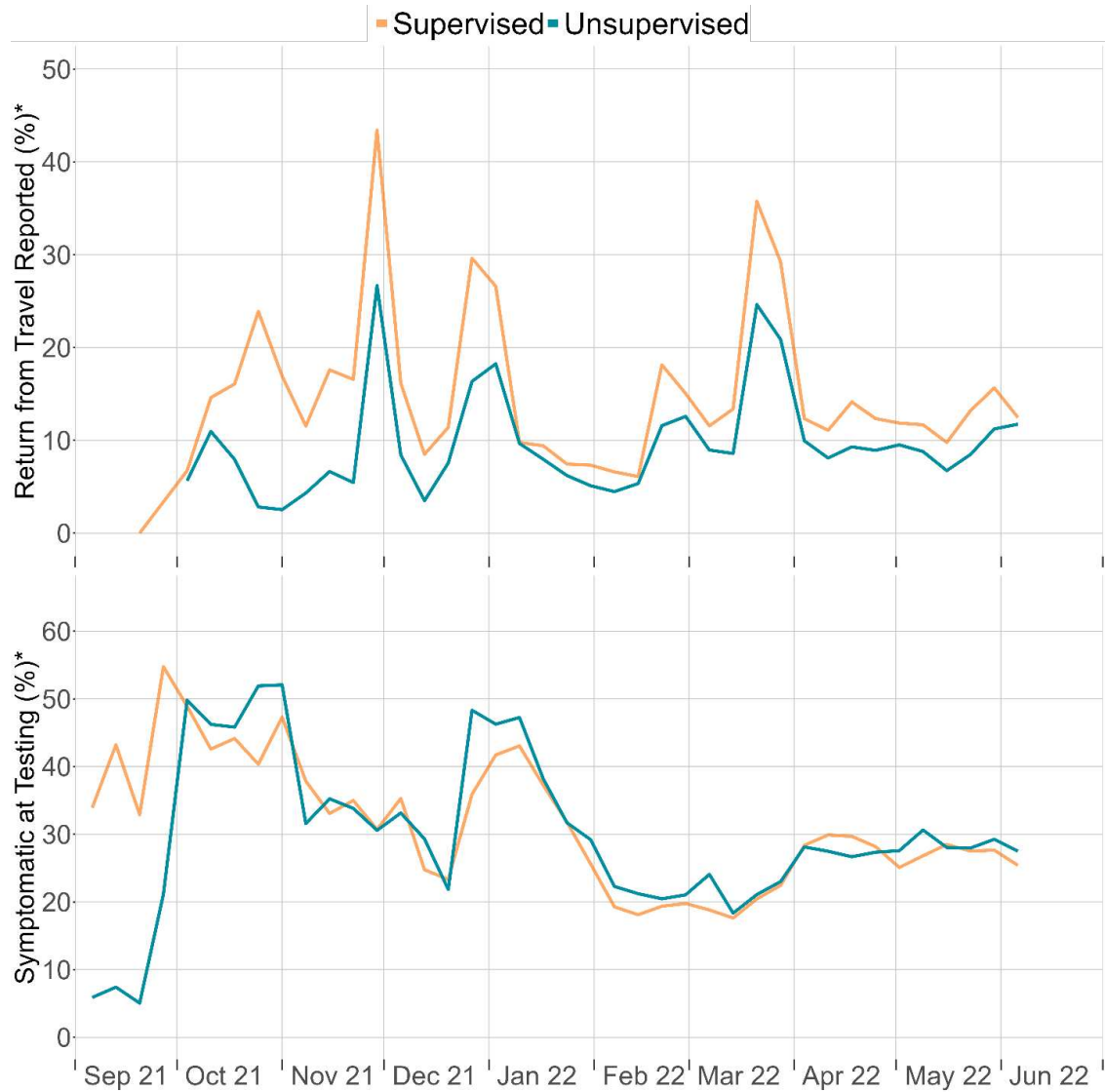
D. Unsupervised self-swab kit packaging (polyethylene mailer bags, ULINE S-17229) are labeled with a study sticker including the study name and logo.

E. (1) Instructions for registering the kit, self-swabbing, and returning the sample (**Supplementary Figure 2**), (2) bag with swab and collection tube labeled with unique barcode (C.), and (3) biospecimen collection bag for returning the sample (VWR 89085-394) are placed in self-swab kit bags (D.)

F. Unsupervised self-swab kits are bundled in batches of 25 and stored in corrugated boxes in a climate-controlled area until distribution.

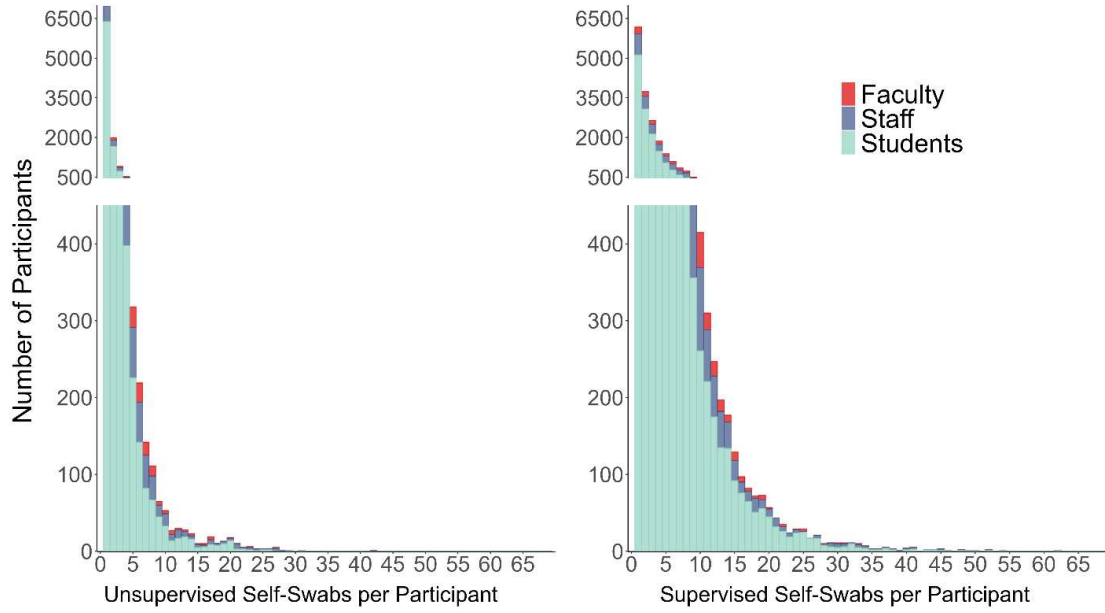
G. Unsupervised self-swab kits are transported to drop box locations on-campus for distribution to study participants.

Supplementary Figure 4. Proportion of individuals reporting return from travel (out of state or country within 7 days prior to testing) and proportion of individuals symptomatic at testing.

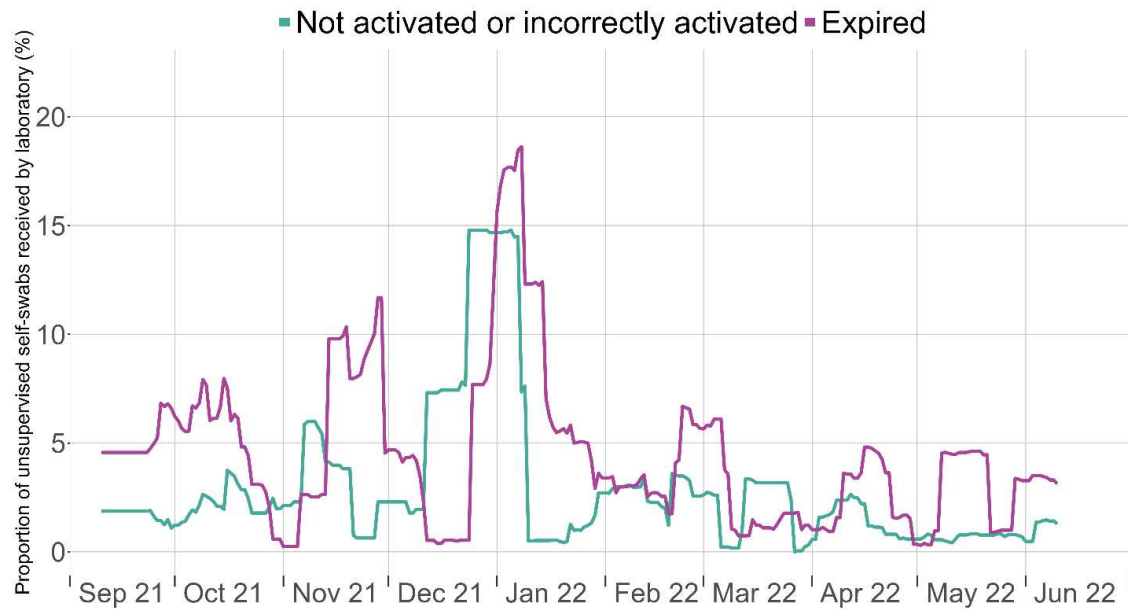


* Proportions are out of those that responded.

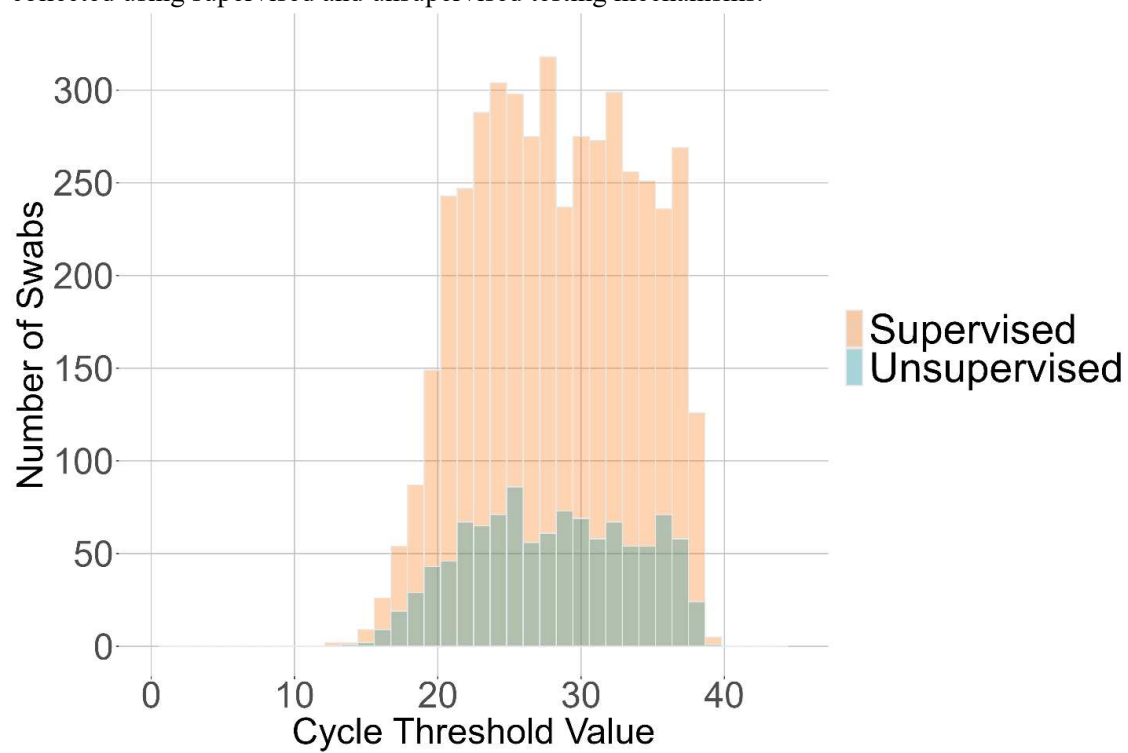
Supplementary Figure 5. Number of unsupervised and supervised self-swabs completed per participant, September 10, 2021 to July 10, 2022.



Supplementary Figure 6. Proportion of all unsupervised self-swabs received by the laboratory that were not tested due to being (1) not activated or incorrectly activated by the participant and (2) expired over the study period. Proportions over time are 14-day moving averages.



Supplementary Figure 7. Distribution of cycle threshold values among positive samples collected using supervised and unsupervised testing mechanisms.



Supplementary Table 1. Demographic data on unique participants by number of COVID-19 self-swabs completed from September 10, 2021–June 10, 2022.

	Number of Self-Swabs Completed by Participant (N=26359)		
	N=1 (25 th percentile) (N=7381, 28.0%)	N=2–5 (middle 50%) (N=12026, 45.6%)	N≥6 (≥75 th percentile) (N=6952, 26.4%)
Enrolled in year one of study¹	2523 (34.2%)	5247 (43.6%)	3930 (56.5%)
Testing mechanism(s) used			
Unsupervised only	2948 (39.9%)	1701 (14.1%)	423 (6.1%)
Supervised only	4433 (60.1%)	6588 (54.8%)	3565 (51.3%)
Both	NA	3737 (31.1%)	2964 (42.6%)
Age at enrollment			
Median (IQR)	21.4 (19.5, 26.2)	21.3 (19.7, 26.8)	21.9 (20.0, 34.4)
15-17 years	45 (0.6%)	67 (0.6%)	20 (0.3%)
18-24 years	5272 (71.4%)	8470 (70.4%)	4256 (61.2%)
25-29 years	773 (10.5%)	1119 (9.3%)	549 (7.9%)
30-59 years	1122 (15.2%)	2049 (17.0%)	1724 (24.8%)
≥60 years	168 (2.3%)	321 (2.7%)	403 (5.8%)
Sex			
Male	3270 (44.3%)	4641 (38.6%)	2241 (32.2%)
Female	4074 (55.2%)	7324 (60.9%)	4669 (67.2%)
Other	5 (0.1%)	11 (0.1%)	4 (0.1%)
Unknown	32 (0.4%)	50 (0.4%)	38 (0.5%)
Race			
American Indian/Alaska Native	40 (0.5%)	44 (0.4%)	22 (0.3%)
Asian	2748 (37.2%)	4265 (35.5%)	1961 (28.2%)
Black	221 (3.0%)	268 (2.2%)	127 (1.8%)
Native Hawaiian or other Pacific Islander	33 (0.4%)	34 (0.3%)	15 (0.2%)
White	3289 (44.6%)	5684 (47.3%)	3922 (56.4%)
Other	285 (3.9%)	405 (3.4%)	154 (2.2%)
Multiple Races	543 (7.4%)	1011 (8.4%)	589 (8.5%)
Unknown	222 (3.0%)	315 (2.6%)	162 (2.3%)
Hispanic Ethnicity			
Yes	709 (9.6%)	983 (8.2%)	426 (6.1%)
No	6568 (89.0%)	10901 (90.6%)	6439 (92.6%)
Unknown	104 (1.4%)	142 (1.2%)	87 (1.3%)
Comorbidities			
One or more ²	186 (2.5%)	276 (2.3%)	191 (2.7%)
Affiliation			
Student	6178 (83.7%)	9727 (80.9%)	4888 (70.3%)
On-campus Resident ²	1998 (32.3%)	3525 (36.3%)	1697 (34.7%)
Fraternity or Sorority Member ²	494 (8.0%)	1158 (11.9%)	741 (15.2%)
Faculty	290 (3.9%)	623 (5.2%)	543 (7.8%)
Staff	870 (11.8%)	1609 (13.4%)	1471 (21.2%)
Volunteer	5 (0.1%)	10 (0.1%)	2 (0.0%)
Other	38 (0.5%)	57 (0.5%)	48 (0.7%)

1 Enrolled prior to introduction unsupervised testing on September 10, 2021.

2 Proportions of on-campus residents and fraternity sorority member are among students and are not mutually exclusive (a student can be included in both categories).

Supplementary Table 2. Odds of using an unsupervised self-test versus a supervised self-test by participant characteristics estimated using logistic regression via generalized estimating equations (GEE), October 1, 2021¹–July 10, 2022.

	Unadjusted odds ratio (95% CI)	Adjusted ² odds ratio (95% CI)	P-value ³
All self-swabs⁴, N=103383			
Study year of enrollment ⁵ (one vs. two)	0.48 (0.45, 0.51)	0.47 (0.44, 0.50)	<0.001
Pre- vs. post-Omicron wave (Oct. 1–Dec. 10, 2021 vs. Dec. 11, 2021–July 20, 2022)	0.54 (0.52, 0.56)	0.52 (0.50, 0.54)	<0.001
Age (15–24 years vs.)			
25–29 years	0.84 (0.77, 0.93)	0.81 (0.73, 0.89)	<0.001
30–59 years	1.14 (1.06, 1.22)	0.99 (0.88, 1.13)	
≥60 years	0.88 (0.75, 1.03)	0.75 (0.61, 0.91)	
Sex (female vs.)			
Male	0.99 (0.93, 1.04)	0.95 (0.89, 1.00)	0.18
Other	1.30 (0.50, 3.34)	0.99 (0.36, 2.78)	
Race (White vs.)			
American Indian/Alaska Native	1.23 (0.80, 1.89)	1.07 (0.69, 1.66)	0.95
Asian	1.23 (1.16, 1.31)	1.12 (1.05, 1.20)	
Black	1.46 (1.22, 1.75)	1.26 (1.05, 1.52)	
Native Hawaiian or other Pacific Islander	1.72 (1.08, 2.73)	1.55 (0.97, 2.46)	
Other	1.18 (1.01, 1.38)	0.99 (0.84, 1.18)	
Multiple Races	1.20 (1.09, 1.33)	1.20 (1.08, 1.34)	
Hispanic ethnicity (yes vs. no)	1.12 (1.01, 1.24)	1.16 (1.03, 1.30)	0.01
Affiliation (students vs.)			
Faculty	1.25 (1.11, 1.40)	1.57 (1.33, 1.85)	<0.001
Staff	1.15 (1.07, 1.24)	1.46 (1.30, 1.65)	
Volunteer	0.60 (0.16, 2.31)	0.65 (0.16, 2.67)	
Other	0.96 (0.64, 1.43)	1.00 (0.66, 1.52)	
Symptom status (symptomatic vs. asymptomatic or pre-symptomatic)	0.91 (0.89, 0.94)	0.85 (0.83, 0.88)	<0.001
COVID-19 vaccine status, N=80041 (primary series only vs.)			
Primary series and booster dose	1.46 (1.40, 1.52)		
Unvaccinated	2.12 (1.71, 2.64)		
Students only, N=75416			
Fraternity or Sorority Member (yes vs. no)	0.36 (0.32, 0.40)	0.68 (0.60, 0.77)	<0.001
On-campus Resident (yes vs. no)	2.75 (2.58, 2.93)	2.45 (2.28, 2.64)	<0.001

1 Swabs collected from September 10–30, 2021 were excluded due to unsupervised testing being primarily available for students only (and not faculty and staff) during this time and ‘return to campus’ testing in which unsupervised swab kits were directly distributed to students.

2 Adjusted for year of study enrollment, pre- vs. post-Omicron time period, age, sex, race, ethnicity, affiliation, symptom status, and for students only, fraternity or sorority membership and being and on-campus resident.

3 P-values for covariates with >2 categories are obtained from variance-weighted multivariate Wald tests.

4 Unadjusted and adjusted analyses include study swabs with complete data for the following variables: year of study enrollment, pre- vs. post-Omicron time period, age, sex, race, ethnicity, affiliation, and symptom status; N=103383 swabs of 107135 swabs (96.5%) collected from October 1, 2021–July 10, 2022.

5 Year one enrollment prior to introduction unsupervised testing on September 10, 2021.