Appendix 1: Supplemental material

Sampling Protocol

Materials

Base Materials:

- Sanitizing materials (wipes, alcohol spray, towels, rags, etc.)
- Barrier between participant and person collecting sample
- 1 tube rack
- 1 bottle of hand sanitizer with pump
- 1 trash can
- Table and chairs as necessary

Recurrent Materials (per person):

- 1 pair of gloves
- 2 masks (if necessary one for participant, one for person collecting sample [this can be used across multiple participants])
- 2 biohazard specimen bags with an outside pocket
- 5ml ampoule of saline solution
- 10ml sterile tube
- 30ml collection cup
- Participant label for the sterile tube

Procedures

Preparation

- 1. Set up the barrier on a recently sanitized table with the tube rack on the participant side of the barrier.
- 2. Prior to each participant arriving, in the tube rack place the 5ml ampoule of saline solution and 10ml sterile tube. Next to the tube rack place the 30ml collection cup.
- 3. Place the hand sanitizer on the participant's side of the barrier and place the garbage can next to the participant's seat.
- 4. On the side of the barrier for the person collecting the sample, place 2 biohazard specimen bags, a participant label for the sterile tube, and any required paperwork that will need to be completed for the laboratory.

Sample Collection

- 1. The person collecting the sample should put on a fresh pair of gloves and be wearing a surgical mask meeting minimum Health Canada requirements.
- 2. When the participant arrives, instruct them to have a seat and use the hand sanitizer. Offer them a mask should they not have one.
- 3. Collect the required laboratory information from the participant and any information required for the participant label (e.g., name and date of birth). Confirm the information with the participant.
- 4. Introduce the sample collection procedure to the participant (using steps 5 through 11 below as a guide).
- 5. Instruct the participant to open the saline ampoule and empty the contents into the collection cup. Discard the ampoule in the garbage can.
- 6. Instruct the participant to temporarily remove their mask to place the saline solution in their mouth. Remind the participant to put their mask on after.
- 7. Instruct the participant to follow these steps:
 - a. Swish the saline solution in their mouth for 5 seconds.
 - b. Gargle the saline solution in their throat for 5 seconds.
 - c. Repeat (a) and (b) one more time.

- 8. When the steps are completed, instruct the participant to temporarily remove their mask and spit the contents of their mouth back into the collection cup. Remind the participant to put their mask on after.
- 9. Instruct the participant to open the sterile tube.
- 10. Instruct the participant to pinch the collection cup to create a pseudo-funnel to empty the contents of the collection cup into the sterile tube.
- 11. Instruct the participant to discard the collection cup, close the sterile tube, and place the sterile tube back in the rack.
- 12. Instruct the participant to sanitize their hands. They are now free to leave.

Sample Storage

- 1. When the participant has left, sanitize their side of the table.
- 2. Sanitize the outside of the sterile tube and ensure the tube cap has been placed on securely.
- 3. Attach the participant label to the sanitized tube.
- 4. Place the tube inside one biohazard bag; remove the air and seal securely.
- 5. Place the biohazard bag with the tube into the other biohazard bag; remove the air and seal securely.
- 6. To the outside pouch of the biohazard bag, include any documentation (e.g., requisition form) required by the laboratory.
- 7. Store the sample in a secure place; the sample is stable at room temperature for 7 days.

Cost Assessment Details

We conceptualized cost considerations across six distinct steps:

- 1. Training of staff
- 2. Scheduling and coordination of visits
- 3. Sample collection
- 4. Sample transport
- 5. Laboratory reverse-transcription polymerase chain reaction (RT-PCR)
- 6. Communication of results

We considered three different staff roles:

- Coordinator: \$30 per hour (inclusive of benefits)
- Mobile Team Member: \$23 per hour (inclusive of benefits)
- Administrative: \$20 per hour (inclusive of benefits)

We assumed two mobile team members could sample 100 persons per day or 26,000 persons per year.

Training of Staff

Based on our experience with the study, we estimated that training outside of a research context could be done over 2 days (7h/day) by a coordinator. We assumed this training would need to be done annually. This training would make use of sample collection materials and personal protective equipment. Each day, we assumed each mobile team member would use the equivalent of materials required to sample 10 persons (e.g., each training day, material costs equivalent to sampling 20 persons). We included a cost of \$15 per person, per day for food and refreshments.

Scheduling and Coordination of Visits

Based on our experience in the study, we estimated that scheduling and coordination of visits would require 2h/business by administrative staff. In practice, coordination would include discussion with the business regarding accessibility, location for sampling stations, and other business-specific information. Scheduling would be done in conjunction with the business to ensure processes run smoothly (e.g., ensure employees come every 6 minutes to be sampled to reduce crowding).

Sample Collection

Based on our experience in the study, we estimated that it would take 25 minutes to set up sample stations in the business—this includes unloading the materials, bringing them to the sampling location, and preparing the station for the first participant.

We considered capital purchases required for each station (e.g., chairs, tables, plexiglass, tube racks, sample coolers, bins for materials, trash bins, stationery, dollies to move materials, computer/tablet required for data collection for lab). We assumed these would all need to be replaced annually.

To estimate time associated with sampling participants, measuring time on the initial test was not considered to be representative of how long it would take in practice. This was because data collection for the research study was done throughout the process with the participant and not clearly separated from sample collection. Therefore, we estimated time during re-testing of participants where re-consent was not necessary nor was questionnaire completion. We measured how many participants were sampled by the mobile team over a day in a well coordinated business. One mobile team member re-tested 100 participants over 7h of working time (average time of 4.2 minutes per participant). This was communicated as "not sustainable" by the mobile team member day-in-and-day-out and thus in practice we estimated a more realistic time would be 6 minutes per participant.

For costs associated with sampling, we assumed that each mobile team member would require 4 surgical masks per day and 2 gloves per participant sampled (eye protection and gowns were not required given samples were self-collected behind a physical barrier). To estimate cost associated with sanitizing materials we used the actual costs incurred over the study. Taking into consideration the remaining sanitizing materials at the end of the study, total costs were ~\$800. We assumed one trash bag would be required per business. Sample materials included 2 biohazard bags, a tube label, a 5ml saline ampoule, a 10ml sample tube, and a 30ml collection cup.

Based on our experience in the study, we estimated that it would take 20 minutes to tear down sample stations in the business, sanitize surfaces, and pack materials into the vehicle.

Sample Transport

We used data from the study and estimated the transport time between businesses was 10 minutes and end of day transport to the laboratory was 30 minutes. We used mileage from vehicles during the study and estimated each vehicle was driven ~60km each day. We used Government of Canada¹ mileage reimbursement to estimate costs associated with each travel.

Laboratory RT-PCR

We used the Québec government reimbursement price for RT-PCR analyses related to SARS-CoV-2. This price includes cost of sample accessioning, analysis, and sending of all results to the requesting provider and positive results to public health.

Communication of Results

During our study, we estimated the time to receive results, organize them, and send a text/email to negative participants was just under 5 minutes per person by administrative staff. For persons testing positive, phone calls took approximately 10 minutes and done by a nurse. Only 1/50 tests were positive in our study. If a nurse was paid \$30 per hour, each call to a positive participant would be \$5. The cost for administrative personnel for negative participants would be \$1.58. When combined, *on balance* time associated with communication of results is equivalent to the cost of administrative personnel taking 5 minutes per person. If positive rates doubled (1/25) or quintupled (1/10) then the cost would be equivalent to 5.2 minutes and 5.8 minutes, respectively, of administrative staff time per person. We felt this was negligible and did not consider varying costs.

¹ https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/payroll/benefits-allowances/automobile-automobile-motor-vehicle-allowances/automobile-allowance-rates.html
Appendix 1, as supplied by the authors. Appendix to: Campbell JR, Dion C, Uppal A, et al. Systematic on-site testing for SARS-CoV-2 infection among asymptomatic essential workers in Montréal, Canada: a prospective observational and cost-assessment study. *CMAJ Open* 2022. DOI:10.9778/cmajo.20210290. Copyright © 2022
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Participant Questionnaire

Individual Information Questionnaire SECTION 1. To be filled out by research team: Today's Date (YYYY-MM-DD): _____ Participant ID: _____ SECTION 2. To be filled out by participant. Please complete carefully and use capital letters. **Contact Information** Last Name: _____ Date of Birth (YYYY-MM-DD): _____ Province: _____ Postal Code: _____ Home Telephone: _____ Cell Phone: _____ Email: RAMQ Number:

ALL PERSONS WILL BE NOTIFIED OF THEIR RESULTS BY EMAIL

If you would rather receive results by a text message, please indicate by checking this box: \Box Note: all persons with positive results will be contacted by phone

SECTION 3. To be filled out by participant. Please complete carefully and use capital letters.

3A. De	mographic and Employment Information	
Current	age: Sex (PLEASE CIRCLE): M F	
	y/Race: Please select one option you most identify with. If you don't see any option you identify with, please ne provided. If you do not wish to disclose this information, please select that option. Asian Black Caucasian Hispanic Indigenous Mixed Other, please specify: Do not wish to disclose	specify on the
Emplo	yment: Please select one of the following options:	
	I am a full-time employee	
	I am a part-time employee I am an occasional worker	
3B. Cli	nical Information	
Health	conditions and Habits (please check all that apply):	
	Hypertension	
	Diabetes Chronic respiratory conditions	
Ш		
	If checked, please specify:	
	Heart disease Current cigarette smoking	
	If checked, how many packs do you smoke per day?	
	How old were you when you started smoking?Past cigarette smoking	
	If checked, how many packs did you smoke per day?	
	How old were you when you started smoking?	
	How old were you when you stopped smoking?Other:	
Have yo	u traveled outside of greater Montreal region to another region within Quebec in the last 14 days? Yes, indicate where: No	
Have vo	u traveled outside of Quebec within the last 14 days?	
	Yes, indicate where:	
	No	
Do you	have known contact with a person with confirmed COVID-19? Yes, at some point Yes, within the last 14 days	

How ar	e you are feeling today, in general (CHECK (ONE of the following)		
	I feel fine - same as any other day	<i>O</i> ²		
	I feel a little 'under the weather' and not m	y best today		
	I feel quite ill and not myself at all today			
	have any of the following symptoms TODAY check ANY that apply):	; consider only those unus	sua	l or out of the ordinary from how you feel any other day
	Fever	we weather and not my best today my self at all today ng symptoms TODAY; consider only those unusual or out of the ordinary from how you feel any other day Loss of taste or smell		
	Dry cough Tiredness	Γ		A rash on skin, or discolouration of fingers or toes
		Γ		_
	Aches and pains Sore throat			
	Diarrhea			
	Conjunctivitis			
□ Have v	Headache ou had any of the following symptoms IN TE	IE LAST TWO WEEKS: co	nsi	der only those unusual or out of the ordinary from how
	l any other day (please check ANY that apply		1101	and only those unastar or out of the oralitary from now
	Fever	Γ	П	Loss of taste or smell
	Dry cough	_		
	Tiredness			
	Aches and pains			-
	Sore throat			
	Diarrhea			
	Conjunctivitis			
	Headache			
	. 1 . 1 . 001410 1 . 13			
Have yo □	ou previously received a COVID-19 test?	D/MM/VV).		
	No	D/ WIWI/ 11)		
Dlasca i	provide the result of your COVID-19 test:	□ Pocitivo		
i icasc j	provide the result of your COVID-19 test.			
		_		
D]	and the man for the COVER			
riease j	provide the reason for receiving a COVID-19		of a	someone with COVID-10
		□ Other:	,-~	· · · · · · · · · · · · · · · · · · ·

Sample Size

Our initial sample size calculation was based on SARS-CoV-2 rates seen in Montréal during the late fall 2020 and previous reported experience of SARS-CoV-2 positivity among asymptomatic essential workers in Calgary (1.6%). We determined a target prevalence of 5% among essential workers in Montréal-North could be realistic given the state of the pandemic and this previous experience. We used our previous work estimating the number of essential workers across Canada to estimate that there was likely around 5000 essential workers in Montréal-North working in 30 essential businesses with >20 employees and 200 essential businesses with \leq 20 employees. Considering this finite sample size, using a binomial estimator, an intraclass correlation coefficient of 0.3 between businesses, and an absolute precision of \pm 2% around the 5% target, we estimated 2,589 participants would be required to estimate a 5% prevalence with a 95% confidence interval of 3% to 7%. When our study began, the situation in Montréal was substantially different, with several lockdown restrictions in place and a province-wide curfew, which likely impacted community prevalence and our initial estimates of prevalence from late fall 2020.

 $^{^2\} https://globalnews.ca/news/6961600/coronavirus-calgary-asymptomatic-testing-results/$

Table S1. Questionnaire Elements

Variable / Question	Possible Responses (If Applicable)
Personal Information (for Lab/Public Health)	
Today's Date	
Business Name	
Participant ID	
Last and First Name	
Date of Birth	
Address	
Telephone Number	
Email	
Health Insurance Number	
Demographic Information	
Age	
Sex	Male, Female
Ethnicity	Asian, Black, Caucasian, Hispanic, Indigenous,
	Mixed, Other
Employment Status	Full-Time, Part-Time, Occasional
Clinical Information	
	Hypertension, Diabetes, Chronic Respiratory
Health Conditions and Habits	Conditions, Heart Disease, Current or Past
	Cigarette Smoking, Other
Travel Outside of Greater Montréal	Yes (Where), No
Travel Outside of Québec	Yes (Where), No
History of COVID-19 Contact	Yes, No
Feeling Today	Fine, Not My Best, Quite Ill
	Fever, Dry Cough, Fatigue, Aches and Pains, Sore
	Throat, Diarrhea, Conjunctivitis, Headache,
Symptoms Today	Anosmia or Loss of Taste, Rash, Difficulty
	Breathing or Shortness of Breath, Chest Pain or
	Pressure, Loss of Speech or Movement, Other
	Fever, Dry Cough, Fatigue, Aches and Pains, Sore
Constitution in Description The March	Throat, Diarrhea, Conjunctivitis, Headache,
Symptoms in Previous Two Weeks	Anosmia or Loss of Taste, Rash, Difficulty Breathing or Shortness of Breath, Chest Pain or
	Pressure, Loss of Speech or Movement, Other
Previous SARS-CoV-2 Test	Yes, No
Date of Previous SARS-CoV-2 Test	165, 110
Result of Previous SARS-CoV-2 Test	Positivo Nogativo
ACSUIT OF FTEVIOUS SANS-COV-2 TEST	Positive, Negative

Table S2. Detailed Cost Components

Cost Estimate	Additional Details	Cost per Unit*	Cost per Person Sampled†
Training		\$2,058.00	\$0.04
Mobile Team and Coordinator Time	Four mobile team members and one coordinator for 2 days	\$1,708.00	
Food	\$15 per person per day	\$150.00	
Sample Materials	For 10 persons per mobile team member per day	\$139.20	
PPE	For all attendees, 10 sets	\$60.80	
Scheduling	·	\$40.00	\$0.80
Administrative Personnel Time	2 hours per business	\$40.00	
Sample Collection		\$7,631.92	\$5.62
Capital Purchases		\$3,376.59	\$0.18
Chairs	Four chairs per team	\$165.28	\$0.01
Tables	Two tables per team	\$137.90	\$0.01
	Plexiglass barriers per team (2 small, 1	,	
Plexiglass	large)	\$467.11	\$0.02
Cooler	One sample cooler for transport	\$34.00	<\$0.01
Tube Racks	Two tube racks per team	\$40.00	<\$0.01
Bins for Materials	Eight bins per team	\$90.40	<\$0.01
Trash Bins	Two per team	\$94.90	<\$0.01
Stationery	Pens, paper, printing lab forms, etc.	\$1,000.000	\$0.04
Dollies	One per team	\$147.00	\$0.01
Computer/Tablets	Two per team	\$1,200	\$0.09
Recurrent Purchases			\$2.45
Mask	Four per day per team member	\$1.60	\$0.02
Gloves	Two gloves per person	\$0.36	\$0.36
Biohazard Bags	Two per person	\$0.24	\$0.24
Sample Tube	One per person	\$0.51	\$0.51
Saline Ampoule	One per person	\$0.83	\$0.83
Collection Cup	One per person	\$0.06	\$0.06
Sample Label	One per person	\$0.10	\$0.10
Sanitizing Materials	Sanitizer, alcohol sprays, disinfectant wipes, paper towels (realized cost during study)	\$800.00	\$0.30
Trash Bag	Two per business	\$1.44	\$0.03
Mobile Team Personnel Time		\$36.80	\$2.99
Setup	25 minutes per member, per business	\$19.17	\$0.38
Tear Down	20 minutes per member, per business	\$15.33	\$0.31
Sample Collection	6 minutes per member, per person	\$2.30	\$2.30
Transport		\$54.57	\$0.54
Mobile Team Personnel Time	10 minutes of driving between businesses and 30 minutes for one member to drop off samples	\$19.17	\$0.19
Fuel & Mileage	60km per day at \$0.59 per km	\$35.40	\$0.35
Laboratory RT-PCR		\$34.00	\$34.00
Reimbursement cost in Québec	Inclusive of accessioning and sending results back to person/facility ordering the test	\$34.00	
Communication of Results		\$1.67	\$1.67
Administrative Personnel Time	5 minutes—on balance—per person	\$1.67	
OVERALL COST PER PERSON			\$42.67

^{*}See earlier in appendix for additional details, salaries, and assumptions

[†]Assuming two 50-person businesses visited per day by two mobile team members and 26,000 persons sampled per year

Table S3. Distribution of Business Types That Agreed vs. Did Not Agree to Participate

	Businesses That Participated	Businesses That Did Not Participate	
Business Type	n (%)	n (%)	p-value*
Manufacturing/Suppliers	19 (28%)	39 (13%)	0.0021
Auto Sales and Repair	12 (17%)	48 (16%)	0.8392
Childcare	11 (16%)	24 (8%)	0.0415
Public Services	8 (12%)	23 (8%)	0.2902
Grocery	6 (9%)	49 (16%)	0.1394
Retail	6 (9%)	60 (20%)	0.0321
Construction	4 (6%)	31 (10%)	0.3021
Meat Processing	2 (3%)	19 (6%)	0.3227
Legal	1 (1%)	4 (1%)	0.9478

^{*}Chi-square test for difference in overall proportion of business type participating vs. not participating

Table S4. Positive Results Among Participants by Test Number

Parameter	Non-Outbreak Settings	Outbreak Settings				
Businesses	64*	Business A†	Business B†	Business C††	Business D††	Business E††
1st Test	5/1211 (0.4%)	15/98 (15.3%)	9/134 (6.7%)	0/47 (0%)	6/136 (4.4%)	10/502 (2.0%)
2 nd Test		5/78 (6.4%)	3/83 (3.6%)			0/189 (0%)
3 rd Test		0/60 (0%)	0/46 (0%)			0/15 (0%)
4 th Test		0/27 (0%)				
Overall	5/1211 (0.4%)	20/263 (7.6%)	12/232 (5.2%)	0/47 (0%)	6/136 (4.4%)	10/706 (1.4%)

^{*}Includes a separate building not experiencing an outbreak in a business with an outbreak. †Serendipitously found by the study team

^{††}Referred to the study team by public health.

Table S₅. Sensitivity Analysis of Costs Per Person Sampled

Cost Estimates		Cost Per Person Sampled (\$ CAD)				
Cost Estimates	Two 50-person businesses daily	Eight 5-person businesses daily	Four 20-person businesses daily	One 120-person business daily		
TOTAL COST	\$42.67	\$58.33	\$45.28	\$41.62		
TOTAL LABORATORY COST	\$34.00	\$34.00	\$34.00	\$34.00		
TOTAL NON-LABORATORY COST	\$8.67	\$24.33	\$11.28	\$7.62		
Training of Mobile Team	\$0.04	\$0.04	\$0.04	\$0.04		
Coordinator & Mobile Team Personnel	\$0.03	\$0.03	\$0.03	\$0.03		
Materials & Refreshments	\$0.01	\$0.01	\$0.01	\$0.01		
Scheduling Businesses	\$0.80	\$8.00	\$2.00	\$0.33		
Administrative Personnel	\$0.80	\$8.00	\$2.00	\$0.33		
Sample Collection	\$5.62	\$12.11	\$6.70	\$5.19		
Mobile Team Personnel	\$2.99	\$9.20	\$4.03	\$2.59		
Sanitizing Materials	\$0.33	\$0.59	\$0.38	\$0.32		
Personal Protective Equipment	\$0.38	\$0.40	\$0.38	\$0.37		
Sample Collection Materials	\$1.74	\$1.74	\$1.74	\$1.74		
Capital Purchases	\$0.18	\$0.18	\$0.18	\$0.18		
Sample Transport	\$0.54	\$2.51	\$0.8 7	\$0.39		
Mobile Team Personnel	\$0.19	\$1.62	\$0.43	\$0.09		
Vehicle & Fuel	\$0.35	\$0.89	\$0.44	\$0.30		
Communicating Results	\$1.67	\$1.6 7	\$1.6 7	\$1.67		
Administrative Personnel	\$1.67	\$1.67	\$1.67	\$1.67		

Table S6. Crude Odds Ratios for Factors Potentially Associated with a Positive Test

Factor	Number of Participants (N=2128)	Tests Positive (%)	Crude Odds Ratio† (95% CI)		
Age (per 1-year increase)			1.0 (0.98 to 1.03)		
Sex					
Female	808	9 (1.1%)	1.0 (reference)		
Male	1320	44 (3.3%)	2.4 (1.1 to 5.5)		
Self-Reported Ethnicity					
Caucasian	926	4 (0.4%)	1.0 (reference)		
Non-Caucasian	1202	49 (4.1%)	4.0 (1.5 to 10.6)		
Health Factor					
None Reported	1681	45 (2.7%)	1.0 (reference)		
Any Reported*	447	8 (1.8%)	0.7 (0.3 to 1.6)		
Smoking History					
Never Smoker	1668	46 (2.8%)	1.0 (reference)		
Current or Previous Smoker	460	7 (1.5%)	0.6 (0.3 to 1.4)		
Feeling on Day of Testing**					
"Fine, Same as Any Other Day"	2098	51 (2.4%)	1.0 (reference)		
"Not My Best Today"	30	2 (6.7%)	2.1 (0.4 to 10.0)		
Previous SARS-CoV-2 Test	30	2 (0.//0)	2.1 (0.4 to 10.0)		
History***					
Never Previously Tested for	1155	40 (0.6%)	1.0 (reference)		
SARS-CoV-2	1155	42 (3.6%)	1.0 (reference)		
Previously Tested for SARS-	882	0 (1 0%)	0.0 (0.1 to 0.7)		
CoV-2 and Always Negative	002	9 (1.0%)	0.3 (0.1 to 0.7)		
Previously Tested for SARS-	01	2 (2.2%)	0.7 (0.2 to 3.0)		
CoV-2 and Positive	91	2 (2.2/0)	0./ (0.2 to 3.0)		
Business Size					
≤50 Participants	895	4 (0.4%)	1.0 (reference)		
>50 Participants Abbreviations: SARS-CoV-2, severe acute respiratory syr	1233	49 (4.0%)	10.4 (0.7 to 146.5)		

Abbreviations: SARS-CoV-2, severe acute respiratory syndrome coronavirus2

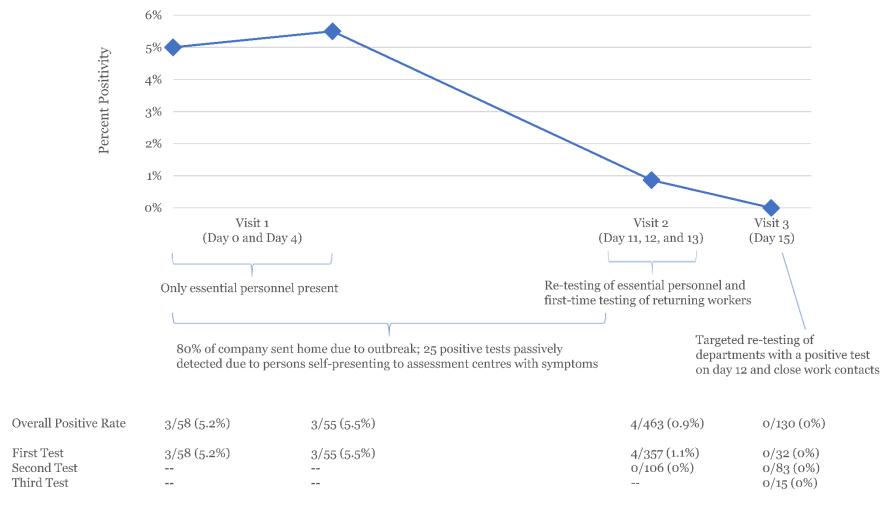
[†]The model accounts for clustering by business and sector

^{*}includes hypertension, diabetes, chronic respiratory conditions (e.g., asthma), heart disease, or participant reported conditions

^{**}refers to reporting on electronic questionnaire (not to study team), which was reviewed post-visit

^{***}considers only tests done prior to study enrolment

Figure S1. Outbreak Progression at Business C



Caption: Business C was referred by public health and was in the manufacturing and supplier sector. It had temporarily reduced staffing by 80% to combat an ongoing outbreak. Due to staggered schedules, our initial visit was done over two visits, 4 days apart—we found 6/113 (5.3%) participants tested positive. All employees returned to work on day 11. Over three consecutive days we offered testing to all returning employees and all persons initially negative. On the first day, none of the 106 participants being re-tested were positive (100% testing uptake). None of the returning employees consenting to testing on day one (105 participants) and day three (121 participants) were positive. However, on the second day, 4/131 (3.1%) of participants receiving their first test were positive. We returned to the business three days later to conduct targeted re-testing among departmental and other close contacts who were previously negative—none of the 130 tests were positive (100% testing uptake). Up to March 26, 2021 (two weeks after study end) no new infections have been reported.