COronavirus Pandemic Epidemiology (COPE) Consortium: An Update

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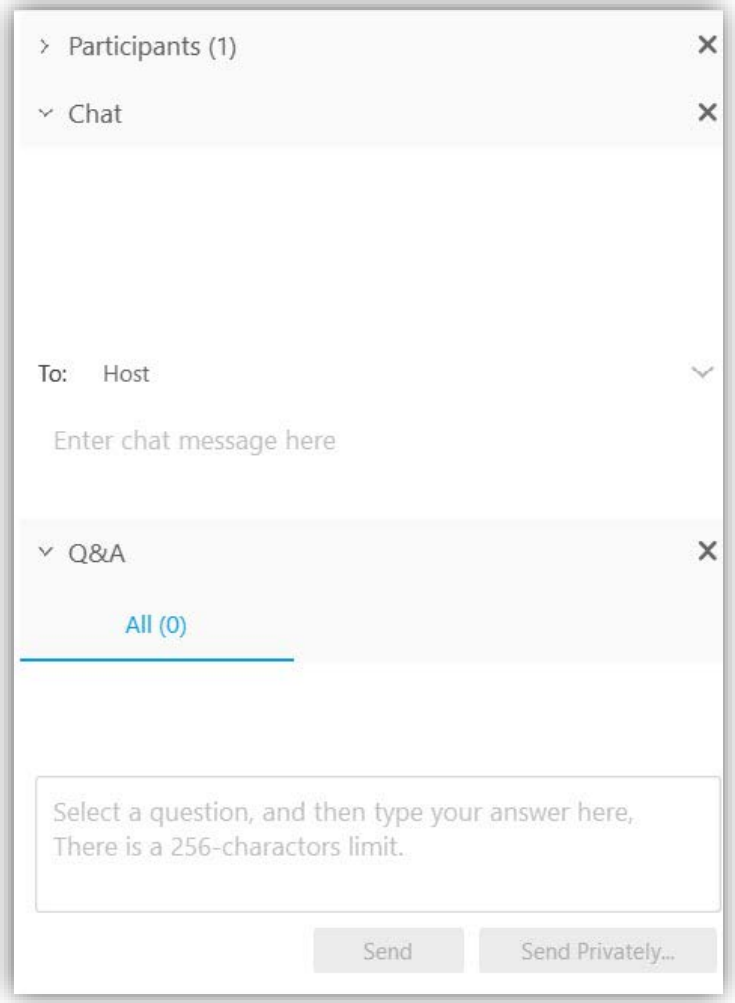

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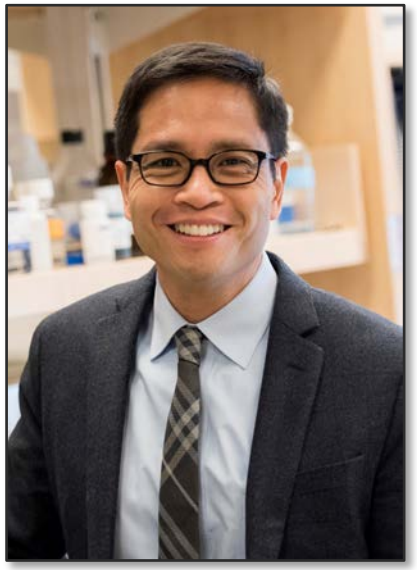

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COVID-19 Pandemic Epidemiology Consortium

Andrew T. Chan, MD, MPH

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NCI Webinar

June 29, 2020

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COronavirus Pandemic Epidemiology (COPE) Consortium

Call for Investigators of Cohort and Clinical Studies

We are reaching out to investigators of cohort and clinical studies to join our efforts through a **CO**ronovirus **P**andemic **E**pidemiology (**COPE**) consortium in which cohorts (e.g., population based, clinic, etc.) and clinical studies could deploy this tool at no cost. There are opportunities to customize for your specific needs. We are also working hard to get central IRB approval, if that is of interest. This will offer you an opportunity to rapidly introduce an easy-to-use data collection tool to track COVID-19 exposure, symptoms, and outcomes in real-time during the acute phase of this pandemic, which will be invaluable for your studies. Ultimately, we will be in a position to pool data to address key research questions as a collective. We recognize that this is an extremely busy and uncertain time, but it is important to act quickly given the speed at which the virus is affecting our participants.

If you are interested, please contact us at predict@mgh.harvard.edu and provide us details about your cohort or clinical study, specific needs, and ideas about how this might complement work you are already planning or doing around COVID-19.

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C-19

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- A call for collaboration
- Free tool to implement in ongoing cohorts
- Embedded now in >20 longitudinal cohorts

Download at: Covid.joinzoe.com/us

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CANCER EPIDEMIOLOGY, BIOMARKERS & PREVENTION | COMMENTARY

The COronavirus Pandemic Epidemiology (COPE) Consortium: A Call to Action

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3,828,812

CONTRIBUTORS

People of all ages and backgrounds are joining together to fight COVID. Help scientific research to get us out of lockdown safely.

Take 1 minute each day and help fight the outbreak in your community

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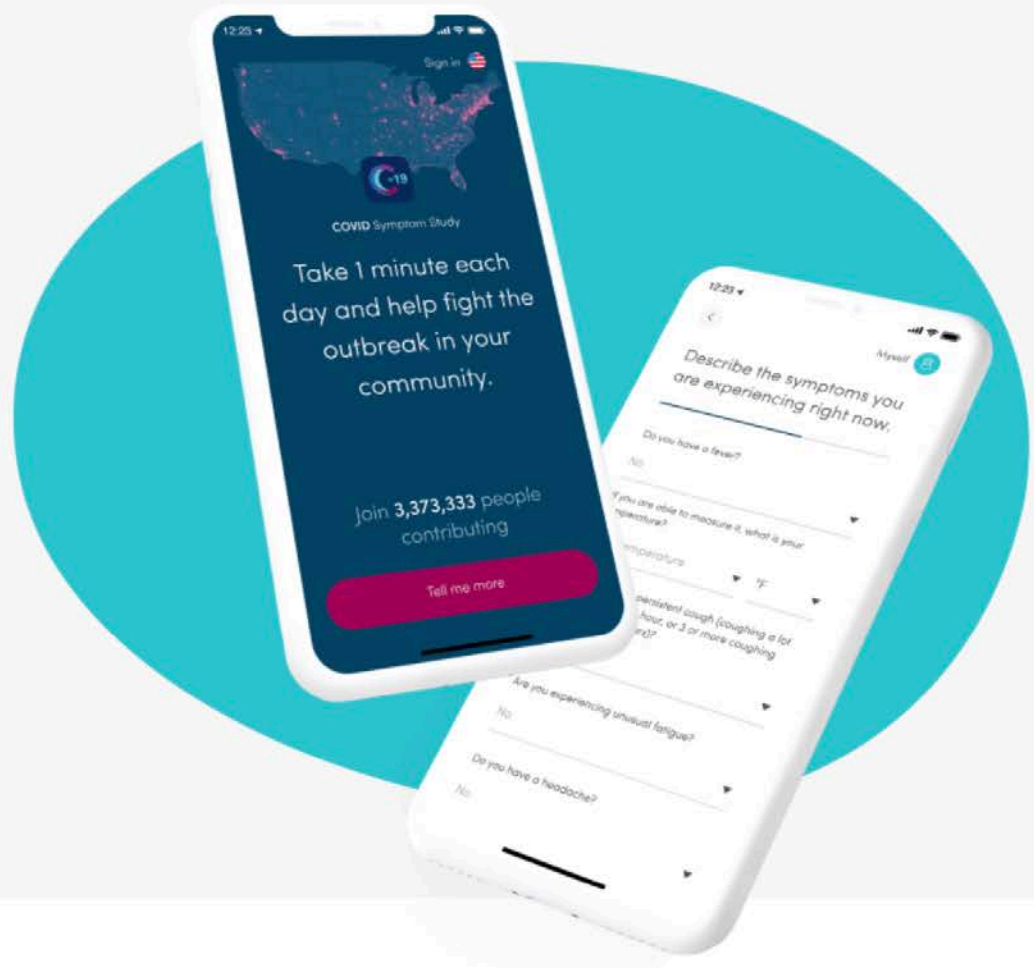
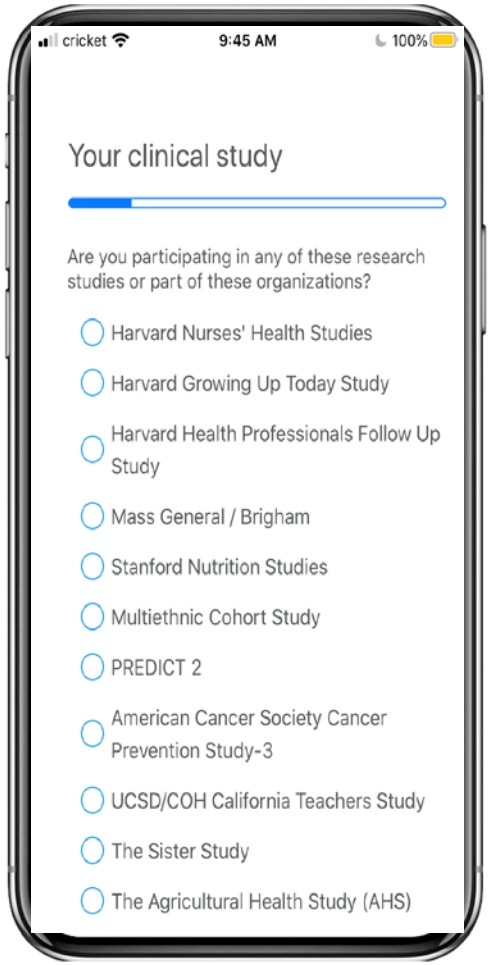
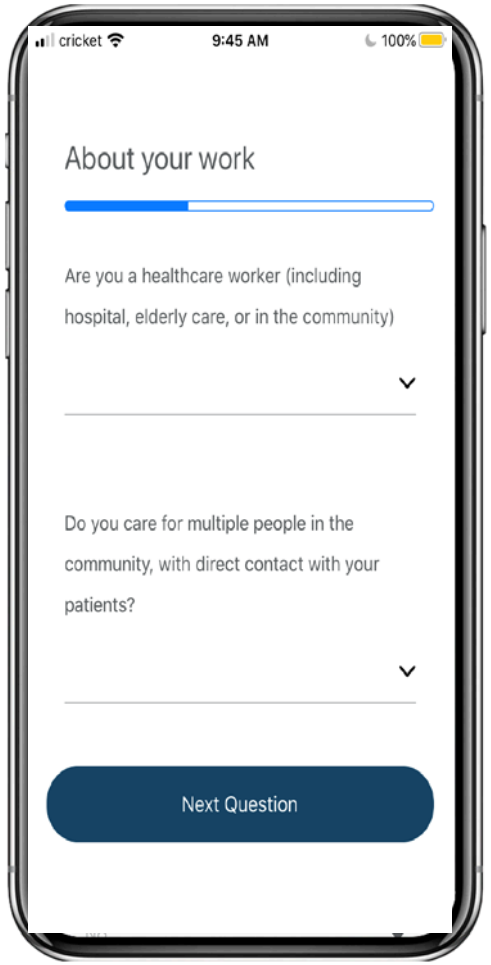
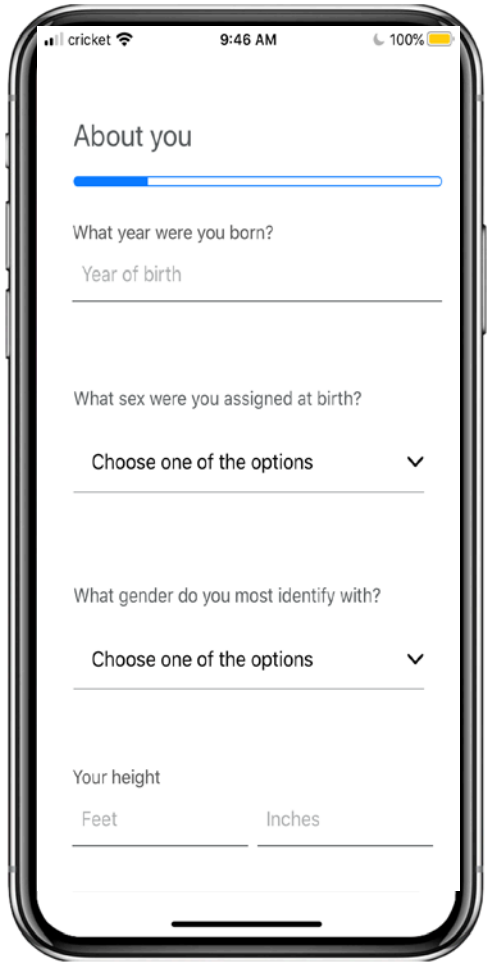
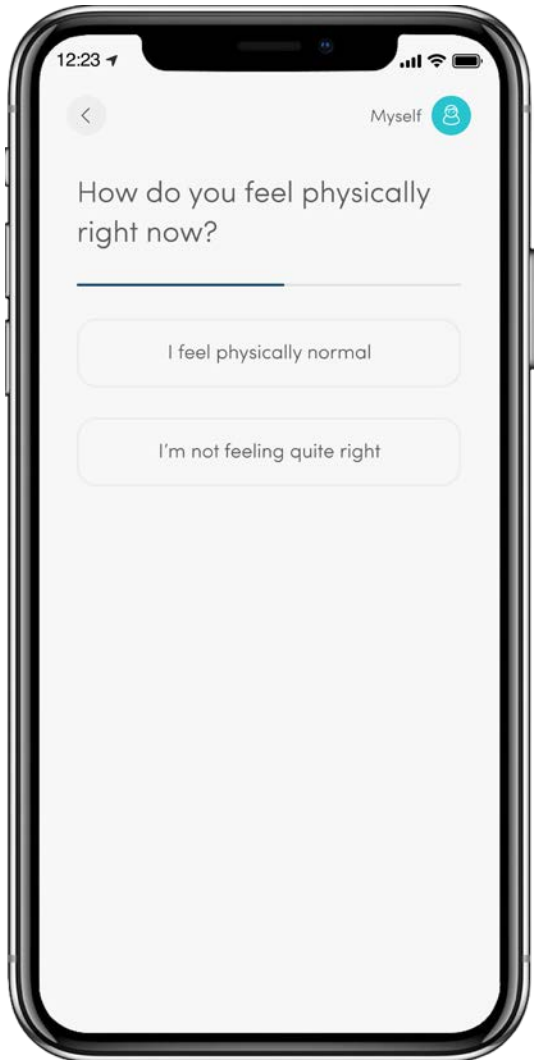


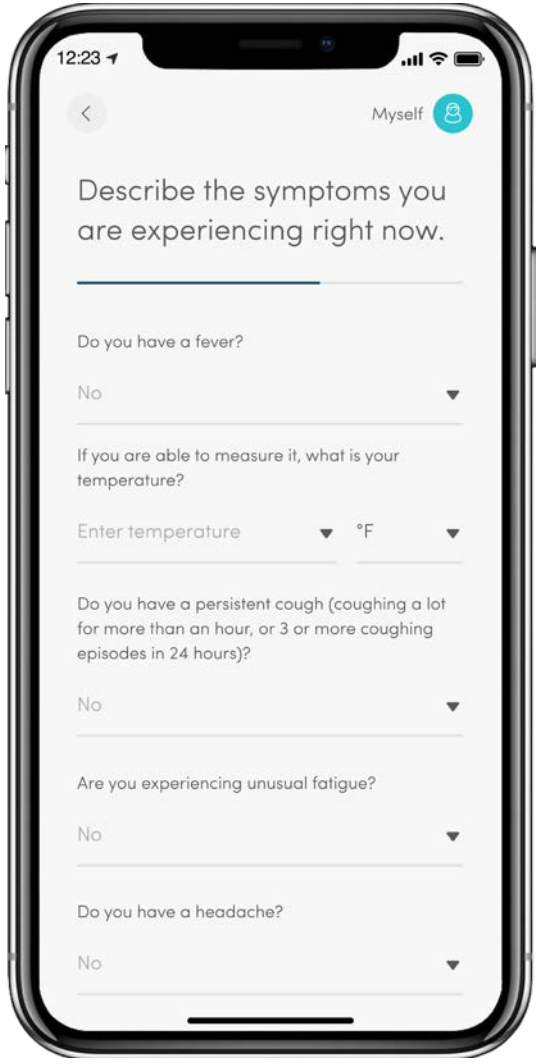
Initial information gathered

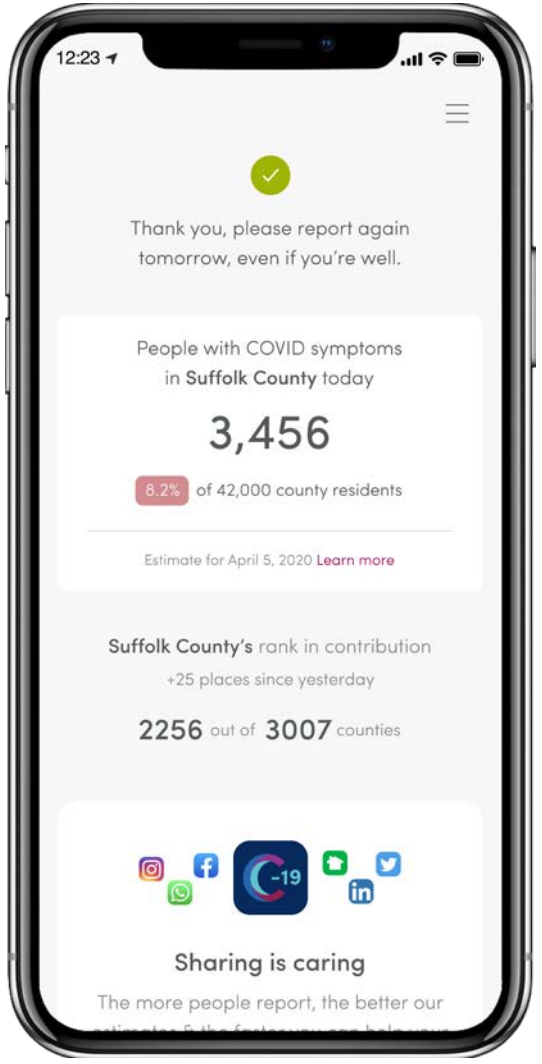












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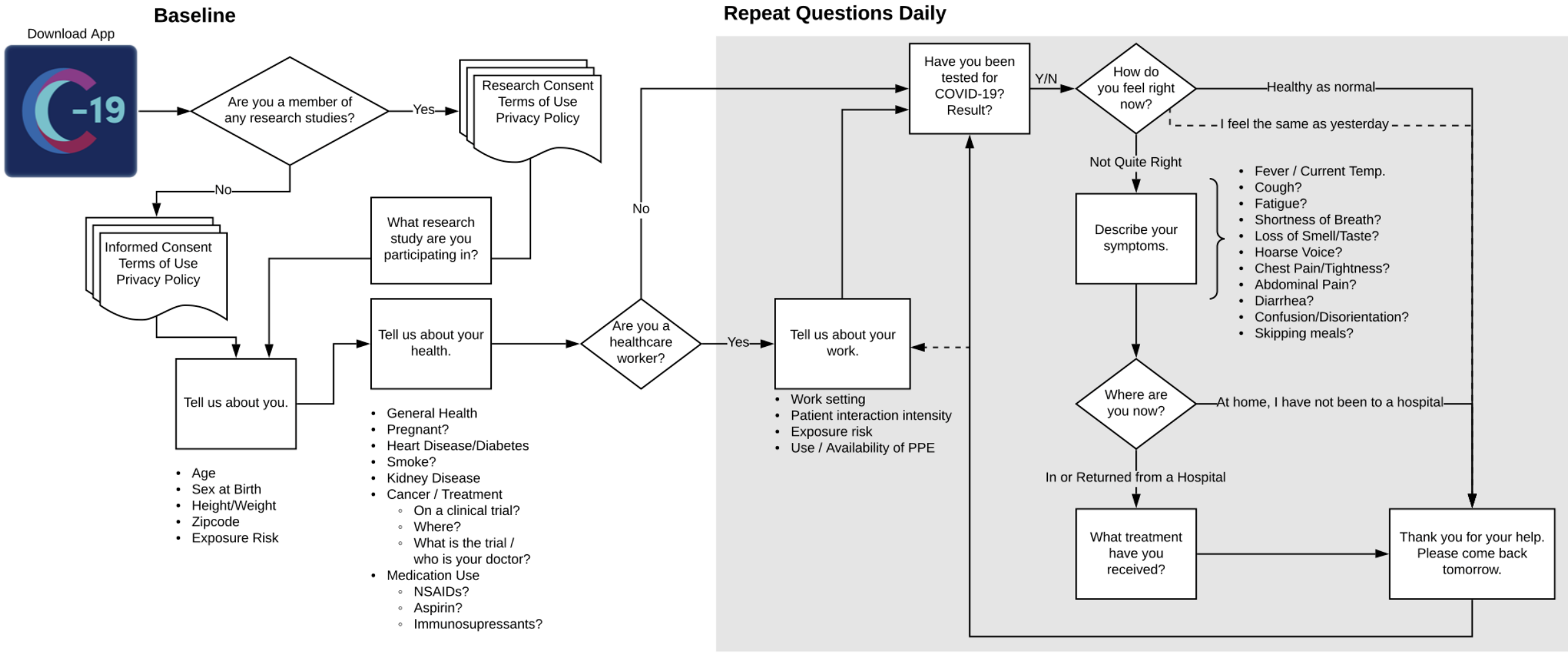
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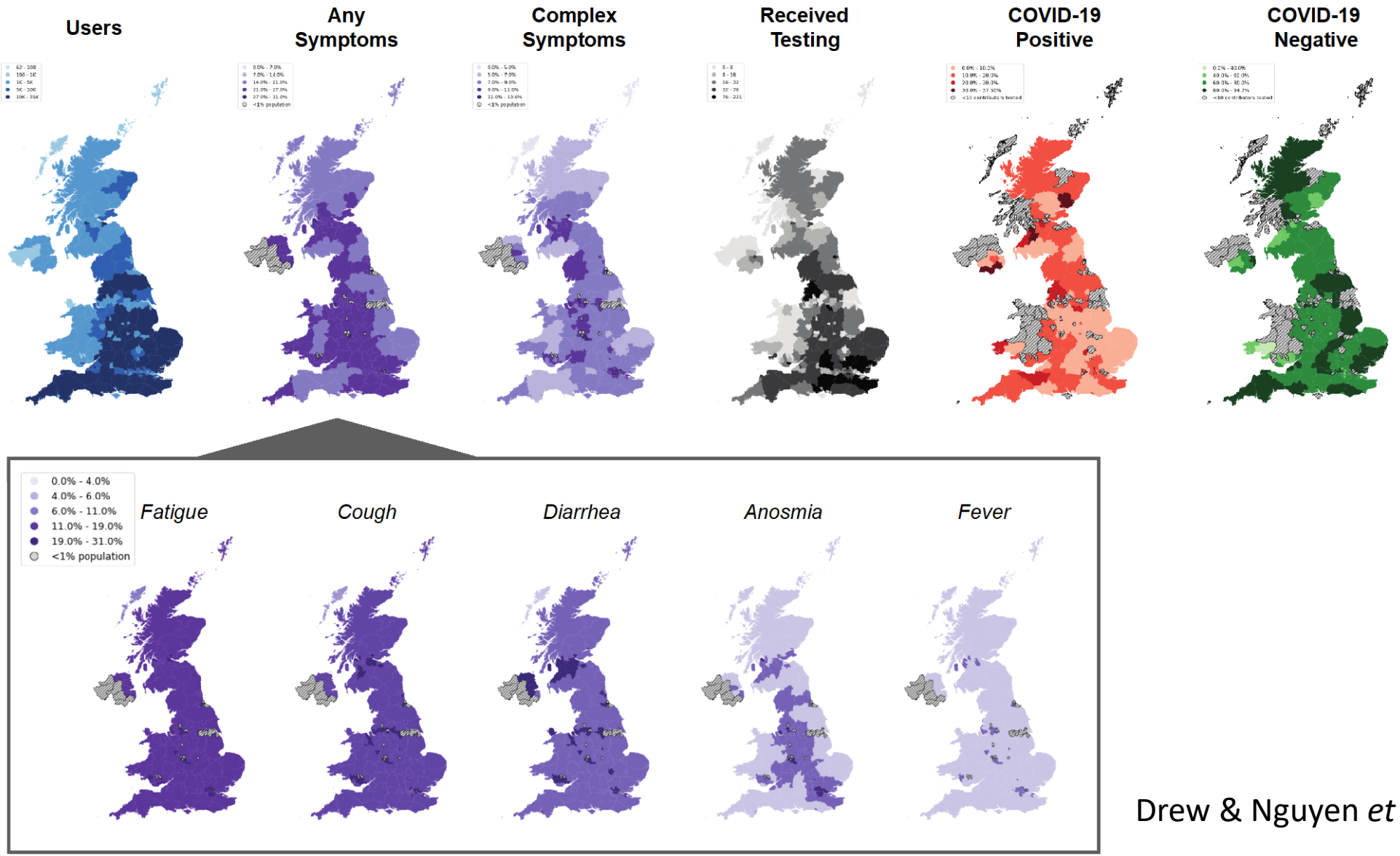
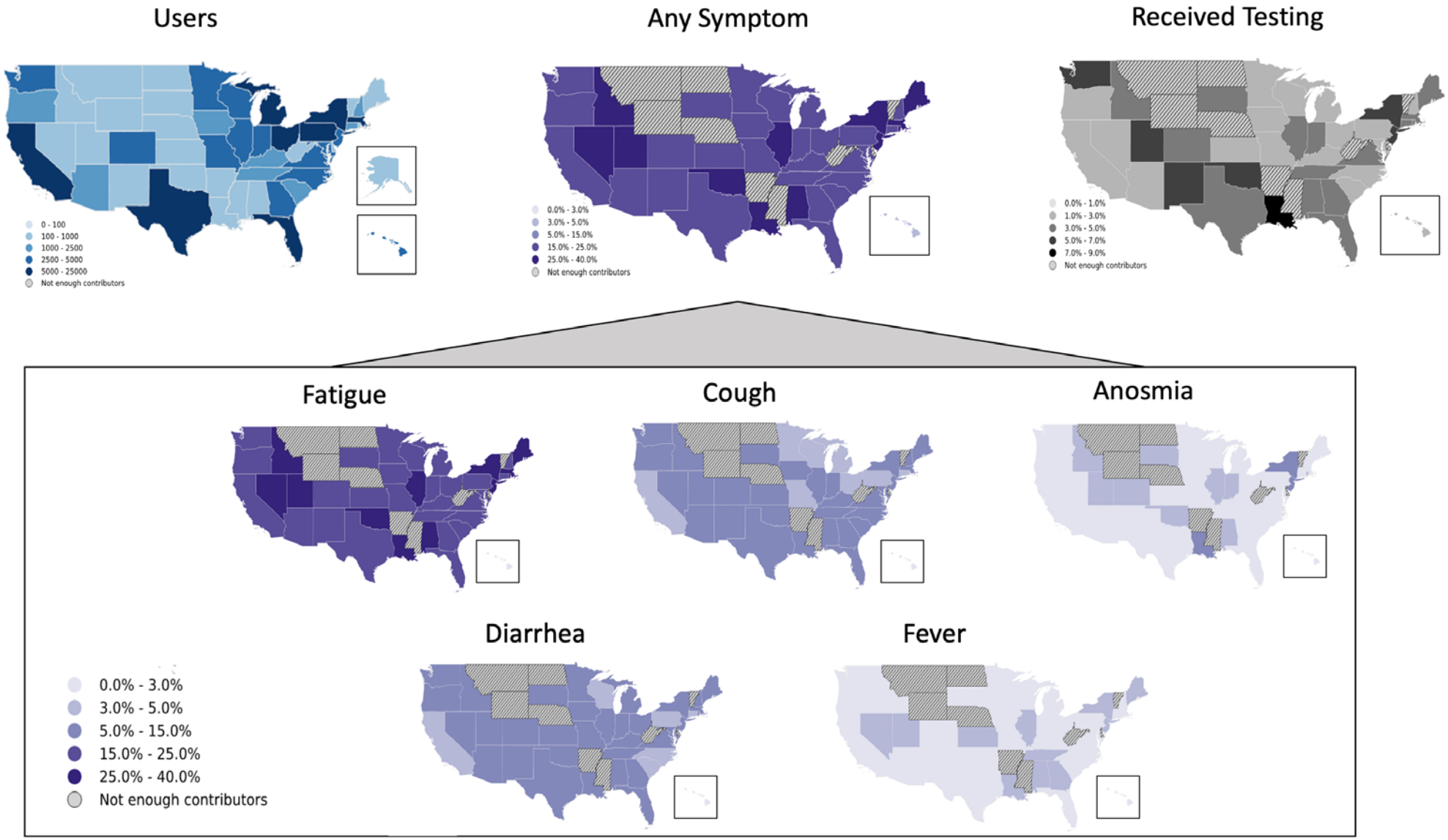
Are you a member of any research studies?
Yes
No
Research Consent
Terms of Use
Privacy Policy
Informed Consent
Terms of Use
Privacy Policy
What research study are you participating in?
Tell us about you.
Age
Sex at Birth
Height/Weight
Zipcode
Exposure Risk
Tell us about your health.
General Health
Pregnant?
Heart Disease/Diabetes
Smoke?
Kidney Disease
Cancer / Treatment
On a clinical trial?
Where?
What is the trial / who is your doctor?
Medication Use
NSAIDs?
Aspirin?
Immunosupressants?
Are you a healthcare worker?
No
Yes
Tell us about your work.
Work setting
Patient interaction intensity
Exposure risk
Use / Availability of PPE
Have you been tested for COVID-19? Result?
Y/N
How do you feel right now?
Healthy as normal
I feel the same as yesterday
Not Quite Right
Describe your symptoms.
Fever / Current Temp.
Cough?
Fatigue?
Shortness of Breath?
Loss of Smell/Taste?
Hoarse Voice?
Chest Pain/Tightness?
Abdominal Pain?
Diarrhea?
Confusion/Disorientation?
Skipping meals?
Where are you now?
At home, I have not been to a hospital
In or Returned from a Hospital
What treatment have you received?
Thank you for your help. Please come back tomorrow.

Symptom tracking by location - UK



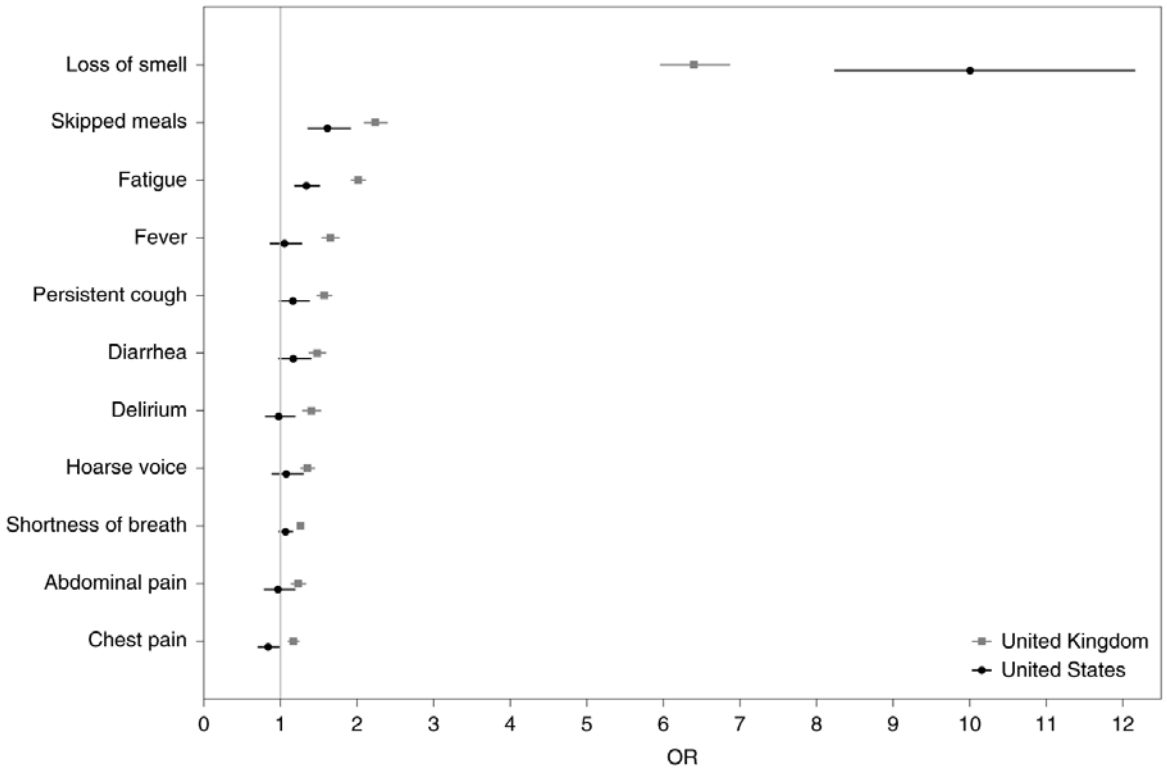
Drew & Nguyen *et al. Science (2020)*



Chan *et al. Cancer Epi Biomark Prev (2020)*

Symptoms associated with COVID-19 + test

Symptoms associated with COVID+

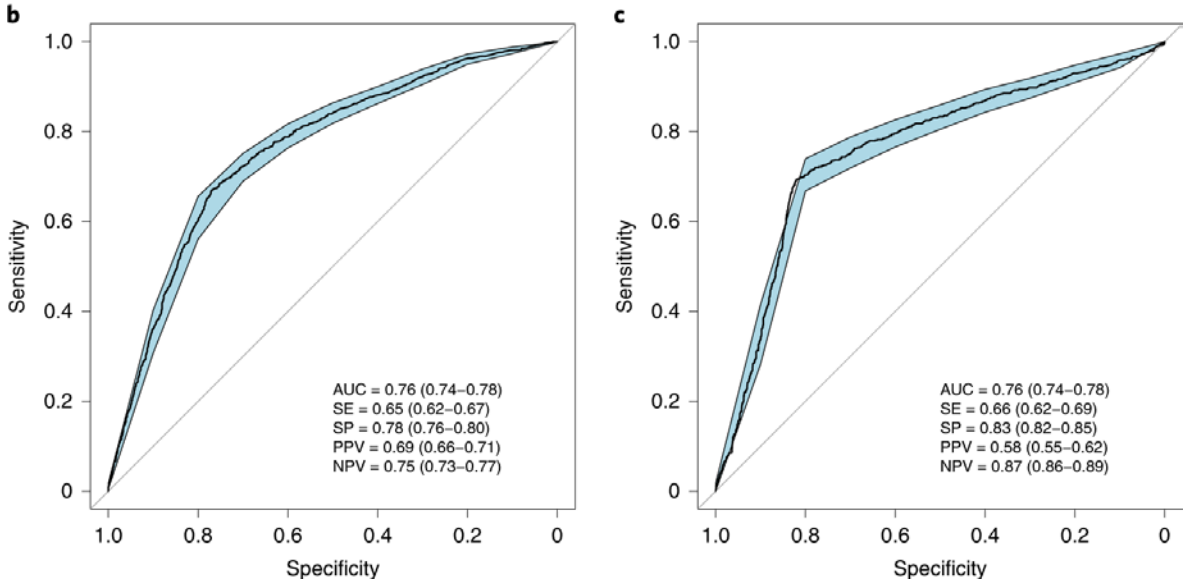


Loss of smell/taste was strongly predictive of COVID-19+, as were skipped meals, severe fatigue, and persistent cough

Menni & Valdes *et al. Nature Med.* 2020

Prediction model of COVID-19 based on symptoms

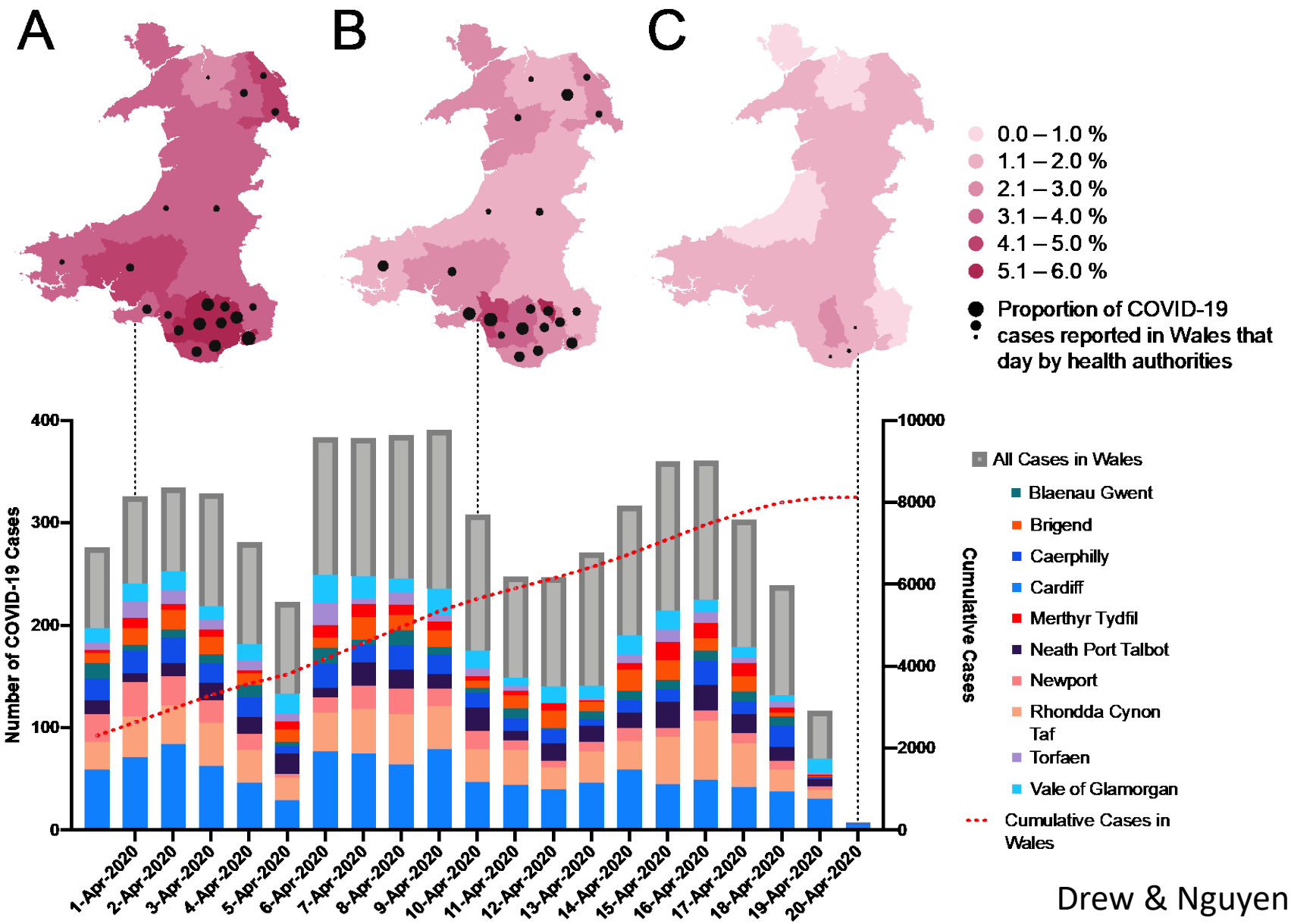
Model performance



Using a symptom-based classifier (age, sex, and the presence of 4 symptoms) was able to predict COVID+ with modest sensitivity and good specificity

Menni & Valdes *et al. Nature Med.* 2020

“Hotspot” identification in real-time



Drew & Nguyen *et al. Science (2020)*

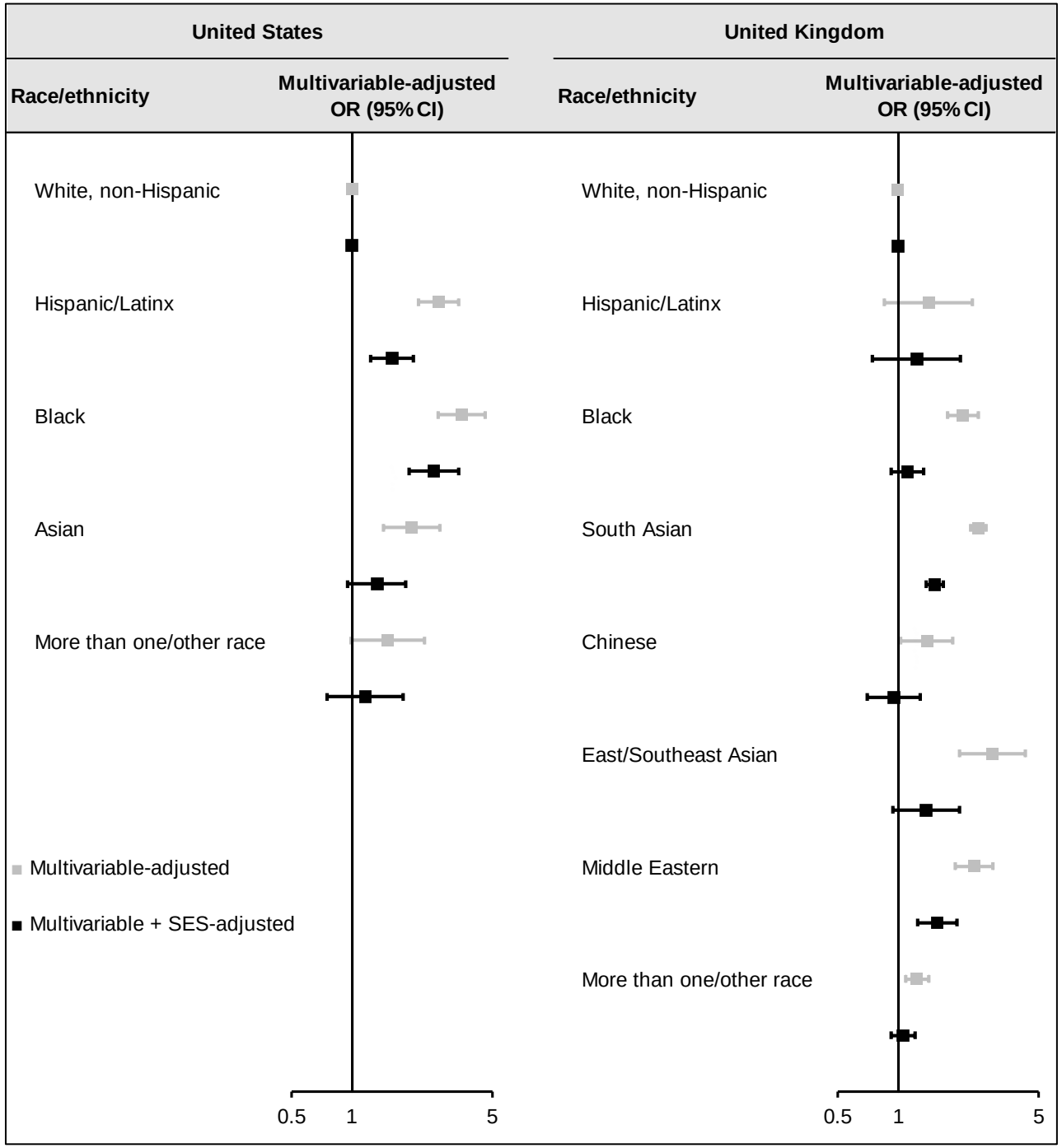
Risk of a COVID-19 according to race and ethnicity

a. United States	Race/Ethnicity				
	White, non-Hispanic	Hispanic/Latinx	Black	Asian	More than one/other race
Individuals testing positive / n	498/147325	89/9251	65/4977	41/6828	23/4774
Age-adjusted OR (95% CI)[a]	1 (reference)	2.69 (2.14-3.39)	3.69 (2.83-4.81)	1.87 (1.36-2.58)	1.52 (1.00-2.31)
Multivariable-adjusted OR (95% CI)[b]	1 (reference)	2.68 (2.13-3.38)	3.51 (2.68-4.60)	1.97 (1.43-2.73)	1.51 (0.99-2.30)
Multivariable-adjusted OR (95% CI) weighted by IPW[b]	1 (reference)	1.66 (1.18-2.34)	2.49 (1.68-3.69)	1.42 (0.86-2.35)	1.32 (0.67-2.61)

b. United Kingdom	Race/Ethnicity							
	White, non-Hispanic	Hispanic/Latinx	Black	South Asian	Chinese	East/Southeast Asian	Middle Eastern	More than one/other race
Individuals testing positive / n	8335/2104829	15/2379	121/13057	485/46350	44/7736	27/2110	82/8466	226/48908
Age-adjusted OR (95% CI)[a]	1 (reference)	1.42 (0.86-2.36)	2.17 (1.81-2.60)	2.44 (2.23-2.68)	1.30 (0.97-1.75)	2.85 (1.95-4.16)	2.28 (1.83-2.83)	1.23 (1.08-1.40)
Multivariable-adjusted OR (95% CI)[b]	1 (reference)	1.41 (0.85-2.34)	2.10 (1.75-2.51)	2.50 (2.28-2.74)	1.39 (1.03-1.87)	2.93 (2.01-4.28)	2.38 (1.91-2.96)	1.24 (1.09-1.41)
Multivariable-adjusted OR (95% CI) weighted by IPW[b]	1 (reference)	1.71 (0.89-3.27)	1.97 (1.47-2.64)	1.68 (1.43-1.97)	1.79 (1.08-2.96)	1.02 (0.55-1.87)	2.10 (1.52-1.87)	2.10 (1.52-2.91)

Abbreviations: CI, confidence interval; OR, odds ratio.
[a]Stratified by age and date of entry into the study.
[b]Adjusted for sex, history of diabetes, heart disease, lung disease, kidney disease, and current smoker status (each yes/no), and body mass index (17-18.4, 18.5-24.9, 25-29.9, and ≥30 kg/m^2).

Lo, Nguyen, Drew & Graham *et al. Medrxiv*

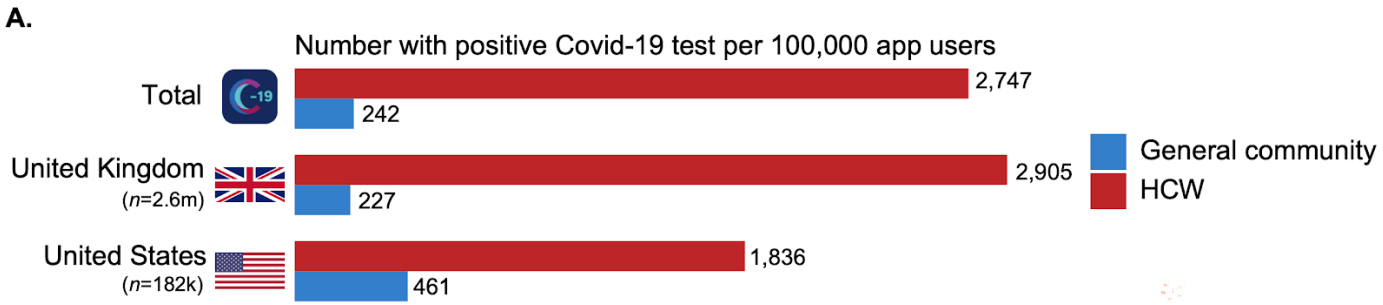


Risk of COVID-19 according to race and ethnicity with adjustment for socioeconomic indices

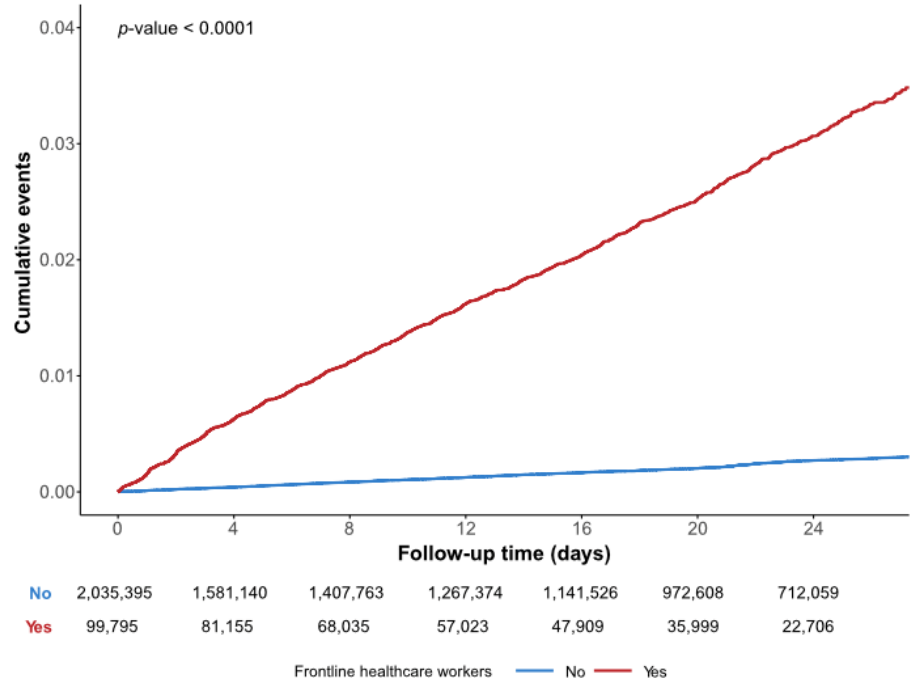
The multivariable association of race and ethnicity adjusted for comorbidities with risk of testing COVID-19 positive (gray). Additional adjustment for isolation, frontline healthcare worker, community exposure, population density, income, and education in each country (black).

Lo, Nguyen, Drew & Graham *et al. Medrxiv*

Healthcare workers and risk of COVID



COVID-19+ cases over time



Frontline healthcare workers are…

- 11x more likely to test COVID+ compared to public
- Inadequate PPE and patient exposure increases risk 6-fold

Nguyen & Drew *et al. Medrxiv*

Healthcare workers, practice site and risk of COVID

	COVID-19+ by practice site			
	Hazard Ratio (95% CI)			
	Age-adjusted	Multivariate-adjusted	% reporting reused PPE	% reporting inadequate PPE
General community	1·0 (ref)	1·0 (ref)		
Frontline HCWs				
Inpatient	23·6 (21·2 to 26·2)	24·3 (21·8 to 27·1)	23·7	11·9
Nursing homes	16·5 (13·6 to 20·0)	16·2 (13·4 to 19·7)	15·4	16·9
Outpatient hospital clinics	10·7 (8·10 to 14·3)	11·2 (8·44 to 14·9)	16·3	12·2
Home health sites	7·79 (5·58 to 10·9)	7·86 (5·63 to 11·0)	14·7	15·9
Ambulatory clinics	6·64 (4·90 to 9·01)	6·94 (5·12 to 9·41)	19·3	11·8
Other	9·42 (7·42 to 12·0)	9·52 (7·49 to 12·1)	12·0	13·8

Frontline HCW and PPE:

- Adequate PPE did not mitigate personal risk of COVID+ when caring for COVID patients
- Inadequate and reused PPE were each linked to greater risk of infection
- PPE reused was greatest in hospitals and shortages were greatest in nursing homes

Nguyen & Drew *et al. Medrxiv*

Racial-ethnic disparities in PPE access

	% reporting reused/inadequate PPE	Odds Ratio (95% CI) Multivariate-adjusted
Overall		
Non-Hispanic white frontline healthcare worker	27·7%	1·0 (ref.)
BAME frontline healthcare worker	36·7%	1·49 (1·36 to 1·63)
According to racial/ethnic subgroup		
Non-Hispanic white	27·7%	1·0 (ref.)
Hispanic/Latinx	49·6%	2·64 (2·03 to 3·45)
Black	33·5%	1·30 (1·02 to 1·65)
Asian	35·6%	1·42 (1·24 to 1·63)
More than one race/other race	34·7%	1·33 (1·12 to 1·57)

Abbreviations: BAME (Black, Asian, and Minority Ethnic), CI (confidence interval), IP (inverse probability)
Multivariate risk factor models were adjusted for 5-year age group, sex, and exposure to patients with COVID-19 (none, suspected, documented).
BAME was defined among individuals who either did not have missing racial information and did not identify as non-Hispanic white.

Frontline HCW and PPE:

- Racial and ethnic minorities were 49% more likely to report inadequate PPE access
  - Hispanic/Latinx and Black individuals were disproportionately affected
- Racial and ethnic minorities tended to work in hospitals and nursing homes where PPE disparities were greatest

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Cancer and risk of COVID-19

	Event/participants	Model 1 OR (95% CI)	Model 2 OR (95% CI)
Living with cancer			
No	8,173/1,575,259	1	1
Yes	124/21,155	1.63 (1.37, 1.96)	1.88 (1.56, 2.27)
Chemotherapy/ immunotherapy			
Not taking	13,854/3,203,142	1	1
Currently taking	68/7,867	2.52 (1.98, 3.21)	2.60 (2.023, 3.34)

Model 1: adjusted for age groups, country and date at entry;
Model 2: further adjusted for BMI, sex, history of diabetes, heart disease, lung disease, kidney disease, cancer, housebound problems, interaction with COVID-19 in the community, frontline HCW and current smoker status.

Lee & Ma *et al. Medrxiv*

COVID Symptom Study

Tómese 1 minuto diario y ayude a combatir el brote en su comunidad.

MASSACHUSETTS GENERAL HOSPITAL · STAND UP TO CANCER · Nurses' Health Study

Massachusetts General Hospital / Harvard T.H. Chan School of Public Health / King's College London / Stanford University School of Medicine / ZOE

Mientras más personas contribuyan a esta investigación,

Y ayuda a comprender el COVID-19 en su comunidad.

Future directions

- Linkage with other studies, including those offering at home serology
- Validation in other symptom surveillance studies
- Deploy app in specific study populations
  - Community-based initiatives
  - County or city health authorities
  - University communities

Nearly 3 million citizen scientists to date

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For updates follow:
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Questions

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