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Experts explain how contact tracing will end the coronavirus pandemic

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For all the anticipation around new COVID-19 tests, therapeutics and vaccines, public health experts know that the end of the pandemic will depend also on a low-tech, tried-and-true tactic—contact tracing.

Contact tracing sounds simple: alert anyone who has been in contact with an infected person and prevent them from spreading the disease to others. Yet contact tracing involves a tailored plan for each disease and a dedicated workforce with investigative know-how and people skills.

California Gov. Gavin Newsom included the ability to contact trace among the indicators for loosening state-wide stay-at-home orders.

To ramp up contact tracing for COVID-19 in San Francisco, UC San Francisco has been partnering with the San Francisco Department of Public Health (SFDPH) to provide technical assistance, training and manpower.

We talked to UCSF public health experts—Michael Reid, M.D., MPH, who is leading the UCSF contingent, and Susie Welty, MPH, who is working as a contact tracer while her global health research projects are on hold—about the importance of contact tracing, what it's like to tell strangers they've been exposed to the coronavirus, and the long-term outlook for COVID-19.

Who counts as a contact is the million-dollar question

Contact tracing is different for each disease because the definition of a contact depends on how the disease is transmitted. The transmission risks for measles, which can waft across a room, and HIV, which usually requires sexual contact or needle sharing, are vastly different, for example.

For COVID-19, which is spread primarily through droplets, "we are defining close contacts as anybody in the household or anybody who spent more than 10 minutes in close proximity, less than six feet, from an individual who tested positive," said Reid.

Usually this means family, friends, and people who live or work together. It's less likely to be the grocery checkout person or a stranger on the bus, and those are currently not pursued as contacts for COVID-19, said Reid. As we learn more about COVID-19 transmission and the implications of mask-wearing, the criteria for contacts may change, he said.

What contacts are advised to do also differs by disease. For COVID-19, close contacts are asked to quarantine for 14 days, the upper limit of the incubation period for the disease, and those who are symptomatic are referred for testing.

This is how contact tracing works for COVID-19

SFDPH has a team of professional disease case investigators whose "bread-and-butter is doing the work of understanding transmission risks," said Reid. Within 24 hours of SFDPH being notified of a new COVID-19 diagnosis in the city, a disease case investigator gets on the phone with the patient. They check on the patient's welfare and take a full history of where the individual went and who he or she may have interacted with while symptomatic and in the two days prior, when transmission is also possible.

"Disease case investigators are very skilled at asking probing questions," said Reid. They might say, "It sounds like your symptoms developed last Tuesday. It was raining on Tuesday. Do you remember what you were doing when it was raining?"

The list of contacts, which might be three or 30, is entered into an online system called DIMAGI. From there, Reid's team of contact tracers take over.

When a contact tracer logs into the system, she sees the contacts and

their phone numbers. The contacts first receive a text message telling them that SFDPH has important health information and will call them from a specific number. "So we have actually found that a lot of people do pick up their phones," said Welty, who has been working four-hour shifts, five days a week for the past three weeks.

Once she reaches a contact on the phone, Welty goes through a script, first informing the contact that they were likely exposed to the coronavirus. She doesn't reveal who they were exposed to, but sometimes it's obvious, she said, like when it's someone they live with. She tells them they are required to quarantine for 14 days and asks about their living situation: whether they have a separate bathroom to use, whether they can take days off work, whether they have enough groceries. She can refer them to services that will help with cleaning supplies, food, and notifying their workplace.

She asks about any symptoms of COVID-19—fever, dry cough, shortness of breath—and refers anyone with symptoms for testing. She enters all the information into the online system.

After the initial phone call, contacts receive follow-up text messages for 14 days asking about new symptoms. If they report any, they'll get another call to connect them with testing.

In an average four-hour shift, Welty said she can reach about 10 contacts, but it varies based on how complicated each case is. Sometimes she's just leaving a string of voicemails, other times she's helping a household of eight, interviewing each person individually, referring them to testing, getting them what they need to stay at home.

Wraparound services are essential for quarantine

"I think we've noticed even over the three weeks that we've been doing

it, the more that contact tracing is mentioned in the news, people kind of get what we're doing and they're not so suspicious," said Welty.

The fact that Welty is a Spanish-speaker helps. Many of her calls go to the Latinx community, which has been disproportionately affected by COVID-19. Of the first 70 COVID-19 patients treated at Zuckerberg San Francisco General, 83 percent were Latinx.

Contact tracers can also work with translators. No one asks about immigration status.

"For a lot of the Latinx community there are very hard choices because most of them are essential workers and they need money to feed their families or to pay the rent," said Welty. Contacts are emailed a letter from the SFDPH saying they are legally required to quarantine, which sometimes helps with skeptical employers.

"It is absolutely essential that if you're going to ask somebody to quarantine for 14 days because they've been exposed, that you also provide them with wraparound services to enable that," said Reid. "I think we need a completely new vision for how we support those communities that are most blighted by COVID-19."

COVID-19 surveillance will become routine

Currently, there are about 60 contact tracers in the city, many of them, like Welty, are public health researchers from UCSF's Institute of Global Health Sciences. But you don't need a public health degree to do this kind of work, said Welty, just good communication skills and the ability to build rapport with strangers.

The UCSF team is training others, including medical students, city attorneys and librarians to take over and to build up a standing

workforce of about 150 contact tracers for COVID-19.

"Then on an ad hoc basis, we could expand to respond to emerging outbreaks," said Reid.

That may happen as shelter-in-place orders are loosened and people begin to mingle again. "I think as soon as shelter-in-place is lifted is when contact tracing is going to become crucial and critical to our success," said Welty. "Because, really, we're not going to have zero cases, we will have some cases and we really need to catch those nodes before they grow."

Contact tracing will go hand-in-hand with widespread testing—test, trace, test, trace, repeat—until the cases disappear, which may be never, or until we have a vaccine.

These days, large-scale contact tracing is rare in the United States. The cases that require tracing are mostly HIV and other sexually transmitted infections, and the occasional measles outbreak, said Welty, whose normal work is leading large HIV surveillance projects, mostly in Africa. Compared to HIV, COVID-19 does not carry the same stigma or require life-long management, she noted.

"Contact tracing is nothing revolutionary. It's how we beat smallpox and polio," she said.

"Right now, COVID-19 is a standout—like all hands on deck—but eventually, at some point, when we get to a low enough amount of cases, it will be routinized into all the other disease surveillance."

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