

## 「 Early results suggest wearable devices can predict COVID-19 infection」

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A new study by scientists at Scripps Research in La Jolla describes a smartphone app that combines passively collected physiologic data from wearable devices, such as fitness trackers could help public health officials spot and contain outbreaks of the coronavirus that causes COVID-19. [1, 2]

The study findings, published Oct. 29 in the journal Nature Medicine, are part of the ongoing DETECT study (Digital Engagement & Tracking for Early Control & Treatment). About 30,000 people across the United States enrolled between March 25 and June 7, sharing tracker data from their wearable devices and reporting symptoms and diagnostic test results. [2]

One in five Americans owns a wearable device such as a Fitbit or an Apple Watch. The gadgets monitor your heart rate, how many steps you take and your sleep patterns — measurements that often change when you're sick. The app in this study enables researchers to predict who would test positive or negative with a statistical model based on self-reported symptoms; it performed about as well as a model based on wearable device data (heart rate, step count and sleep length). But combining the two predicted test results best. Among the 30,529 device owners who enrolled in the study, 62% were female and 12.8% were aged 65 years or older. 3,811 participants reported at least one COVID-19 symptom, with 54 symptomatic participants reporting positive COVID-19 test results and 279 reporting negative results. [2, 3]

Looking at the wearable sensor data, the researchers found significant differences in sleep and activity metrics between positive and negative cases. However, changes in resting heart rate greater than two standard deviations were detected in only 30.3% of positive cases, which the researchers wrote was not statistically strong enough to discriminate between cases on its own. [2, 3] "

"By better characterizing each individual's unique baseline, you can then identify changes that may indicate that someone has a viral illness," said Quer, director of artificial intelligence at Scripps Research Translational Institute in La Jolla, California. Thus, continuous passively captured data may be a useful adjunct to bricks-and-mortar site testing. Furthermore, traditional screening with temperature and symptom reporting is inadequate. An elevation in temperature is not as common as frequently believed for people who test positive for COVID-19, Quer continued. "Early identification via sensor variables of those who are presymptomatic or even asymptomatic would be especially valuable, as people may potentially be infectious during this period, and early detection is the ultimate goal," Quer said.

In conclusion, these results suggest that sensor data can incrementally improve symptom-only-based

models to differentiate between COVID-19-positive and COVID-19-negative symptomatic individuals, with the potential to enhance our ability to identify a cluster before more spread occurs. This predictive model could be useful within the clinical setting because it is already clear that common screening practices used for COVID-19 can miss pre-symptomatic and asymptomatic cases. Also, with an overload on testing and delayed results, this type of predictive app could offer real-time insights that could help stop the spread of the virus. [4,5]

The DETECT team is now actively recruiting more participants for this important research. The goal to enroll more than 100,000 people, which will help the scientists improve their predictions of who will get sick, including those who are asymptomatic. [1, 5]

#### Reference:

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5. Diana Swift. 03 Nov, 2020 "Biometric Changes on Fitness Trackers, Smartwatches Detect COVID-19" Medscape medical news.

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