# 'CovIdentify' pits smartphones and wearable tech against the coronavirus

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CovIdentify. Credit: Duke University

Researchers at Duke University are exploring how data collected by smartphones, FitBits, Apple Watches and other smartwatches may help determine whether or not device users have COVID-19, the illness caused by the novel coronavirus.

The research study—called CovIdentify—is recruiting participants

through a website at covidentify.org.

The project, led by assistant professor of biomedical engineering Jessilyn Dunn and Ryan Shaw, associate professor of nursing and director of the Health Innovation Lab, will assess whether information about smartwatch wearers' health, such as sleep schedules, oxygen levels, activity levels, and heart rate, can detect early symptoms of COVID-19.

In previous work, Dunn and her team had shown that biometric data collected from wearable devices could indicate if a person was susceptible to various health issues, like diabetes or cardiovascular disease, or if they had an infection. Now, Dunn, Shaw and their collaborators Geoff Ginsburg, M.D., the director of MEDx (Medicine + Engineering at Duke) and Chris Woods, M.D., the associate director of the Duke Center for Applied Genomics and Precision Medicine, will use a similar approach to explore how wearable devices could be a useful tool in the fight against the growing global threat.

In addition to Dunn's previous work with wearable technology, Woods and Ginsburg have several ongoing investigations of wearable data for early detection of infectious disease under funding from the Defense Advanced Research Project Agency.

"The idea for CovIdentify came to us in early March when we realized that there was going to be an explosion of COVID-19 cases across the United States, and we knew this was going to be a long-term health care problem," said Dunn. "The team quickly put together a plan to investigate how the data from mobile devices and smartwatches could provide signals of early COVID-19 infection, and if we could predict the severity of infection."

The first phase of CovIdentify officially launched the first week of April with the covidentify.org website, where participants can input their

relevant demographics and medical information and partake in a daily survey. Delivered via text or email, the survey asks about people they've come in contact with and whether they feel sick. If participants respond with a 'yes," they're prompted to answer more questions about their symptoms, ranking them from none to very severe. Participants will respond to the survey once a day for the first 30 days of the program, and once a week for the following two months. Participants will also be asked to share data from their smartphones and smartwatches.

"The survey was designed to be simple to complete, as we want to encourage consistent participation," said Dunn. "We ask about common symptoms including nasal congestion, runny nose, cough, sore throat, headache, fever and chills, and COVID-specific symptoms, like shortness of breath, nausea and loss of sense of taste and smell. This variety helps us determine which symptoms could be caused by seasonal issues, like allergies or colds, and which ones could be caused by COVID-19."

The Fitbit is currently the only device that can connect to the study. This will change at the end of April, when the team plans to launch the CovIdentify iOS app for iPhones, which can pull data from any wearable device that syncs with the Apple Health app. Shortly afterwards, the team will launch similar programs for Android and Google users. They will comply with each system's privacy standards to ensure that all relevant health data is protected and kept anonymous. Although these devices will provide the team with more biometric data, participants don't need a wearable device to take part in the study.

These resources will help the team gather continuous biometric data about the participants—namely activity levels, sleep, and heart rate—which they can then pair with the daily surveys to see determine if there is a relationship between the biometric data and any symptoms users experience.

"Our goal is to get 12 months of historical data from these apps and six months of data going forward," said Shaw. "This will help us create a baseline so we can see what a person's health usually looks like. The data and surveys collected over the next six months will help us create a trajectory of the illness, so we can see how changes in the digital health data relate to the emergence of specific symptoms."

"We want to see the differences in people who do and don't get sick, and we also want to see what data would indicate a mild illness and what indicates the progression to a severe illness."

Once the data are collected, the team will develop, test and refine their predictive algorithms to detect respiratory infections from the COVID-19 virus. According to Dunn, this information has the potential to become a valuable tool in helping researchers learn how to detect COVID-19 early, which could facilitate better outcomes for everyone.

"We anticipate a great convergence of wearable data, self-reported symptoms, molecular testing and geospatial data to help us manage infections and outbreaks," Ginsburg said. "CovIdentify is at the leading edge of this convergence."

"One of my lab's goals is to arm health care professionals with tools and information to detect illness and intervene early by delivering the right treatment to the right person at the right time," Dunn said. "If this study is successful, we'd be able to use non-invasive and accessible tools to help us control the spread of a dangerous virus, and predict when someone may need more intensive care. If we can achieve this, we may be able to help doctors save more lives."

If you're interested in participating in the program, please sign up at covidentify.org.

Provided by Duke University