Can wearables like Fitbit devices be used to help detect COVID-19?

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The researchers, funded by National Institute for Health Research (NIHR) Maudsley Biomedical Research Centre (BRC), created the Mass Science app that allows COVID-Collab study participants to connect

wearables, such as Fitbit devices, and share data including heart rate, activity and sleep. Participants can also use the app to provide information on geographic location, mood, and mental health in addition to COVID-19 symptoms and a diagnosis if they have tested positive for the disease.

The King's College London researchers will then analyse the data including heart rate and activity when a participant reports feeling ill or tests positive for COVID-19. By looking for differences in the data during the time of reported illness compared with their normal healthy periods, the researchers aim to develop a potential digital test for early warning signs of Coronavirus. If a Fitbit user was previously ill or diagnosed with COVID-19 in the past, they can use the study app to share their historical data covering this period of illness.

The more people the COVID-Collab study can recruit the better capability researchers will have to understand key scientific questions. These include:

- How accurate are wearable devices as digital tests for COVID-19 and other respiratory illnesses? Could automated monitoring of disease symptoms help track the disease nationally or in local hotspots?
- What symptoms are important and which are reliable, early predictors of infection?
- How contagious the virus is, and how different social distancing measures affect the transmission rate of the pandemic in the UK?
- To what extent is social distancing affecting people's mood and causing stress?
- Can we use wearable data to identify COVID-19 infection before you experience symptoms?

Early research shows that resting heart rate data and other key health indicators from wearables have the potential to identify flu-like illness before symptoms emerge. COVID-Collab researchers will analyse heart rate, activity data and location data to look for signals of illness in participants who report in-app having tested positive for COVID-19 or experience known symptoms.

If a signal can be validated by the study, with further development this could form the basis of a continuous monitoring system that sends users alerts when they might be experiencing early symptoms, including elevated resting heart rate, of viruses such as SARS-CoV-2. This would be a valuable tool to help stem the spread of the virus.

Study lead, Dr. Amos Folarin, Software Development Group Leader at the NIHR Maudsley Biomedical Research Centre, said: "With a lack of information on who is infected in the population, especially asymptomatic, we are investigating how wearable data can be used to detect COVID-19. Having a cheap, continuous digital test for infection could be a game-changer.

When you indicate you are experiencing symptoms in the app, we'll be able to look at your data before, during and after this period and compare it to your healthy baseline data.

Passive monitoring of symptoms coupled with movement data could be very useful as lockdown is cautiously lifted across the country. As shops, schools and other businesses reopen we expect an overall increased movement of population and potential for a second wave of COVID-19."

Professor Richard Dobson, Head of Department of Biostatistics and Health Informatics at the NIHR Maudsley BRC, said: "There are more than 8 million regular wearable device users in the UK and the data generated from these devices could be really important in helping our

understanding of disease onset and disease trajectories, provide regional disease surveillance and support a safe lockdown release.

This is a really important project that builds on our previous and ongoing experience in remotely monitoring disease and [mental health](#), and development of our open-source platforms."

Earlier this year, Fitbit announced a collaborative effort to support research aimed at using data from wearables, such as Fitbit devices, to help detect, track and contain infectious diseases like COVID-19. The consortium brings together research already underway, including The Scripps Research Translational Institute's DETECT study [detectstudy.org] and The Stanford Healthcare Innovation lab's COVID-19 wearables study[innovations.stanford.edu]. Building on these partnerships, Fitbit launched its own COVID-19 Study to help Fitbit determine if it can build an algorithm to detect COVID-19, before symptoms start.

"In light of the global pandemic, Fitbit's mission to help people get healthier has never been more important. We've seen early evidence from the Fitbit COVID-19 Study that data from wearables have the potential to serve as a powerful public health tool by helping to identify people with viral illnesses such as COVID-19," said Nicola Maxwell, Director for Fitbit Health Solutions in EMEA. "The new Mass Science mobile app by the research team at King's College London has the potential to leverage the power of community to explore how wearables like Fitbit devices can broaden our understanding of COVID-19 and how the illness affects people's health."

Owning a Fitbit device is not a requirement to participate in the study, but if you own a device or know of someone who does, we are especially keen to hear from you. Information about enrolment is available here.