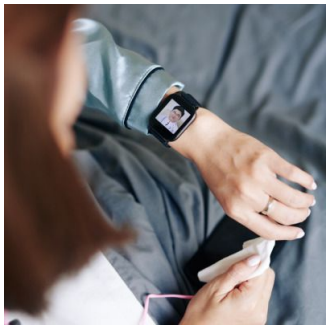
HealthManagement
Promoting Management and Leadership

Wearables Data for COVID-19 Detection



A combination of symptom and sensor data from wearable devices could enhance detection of COVID-19 positive and negative cases in symptomatic individuals, a new study shows (Quer et al. 2020).

You might also like: AI Tool Helps to Reduce COVID-19 Mortality

Study authors, affiliated with the Scripps Research Translational Institute (USA), point out that "individual changes in physiological measures captured by most smartwatches and activity trackers are able to significantly improve the distinction between symptomatic individuals with and without a diagnosis of COVID-19 beyond symptoms alone".

Resting heart rate (RHR), physical activity and sleep are among the biometric measures assessed in this study on improving COVID-19 detection, which builds on an earlier retrospective analysis on the effectiveness of consumer sensors to identify individuals with influenza-like illness.

In their previous study, the Scripps team created a prospective app-based research platform called DETECT (Digital Engagement and Tracking for Early Control and Treatment). This platform enables individuals to share their sensor data, self-reported symptoms, diagnoses and electronic health record data. As such, DETECT can facilitate identification and tracking of viral illnesses, including COVID-19, at the individual and population levels.

The new study, conducted between 25 March and 7 June 2020, included 30,529 individuals (with every American state represented). Study participants used either Fitbit, Apple HealthKit or Google Fit to connect to the DETECT platform. Of the participants, 3,811 reported at least one symptom (12.5%); of those, 54 also reported testing positive for COVID-19 and 279 reported testing negative.

Data analyses revealed that a combination of symptom and sensor data resulted in an area under the curve (AUC) of 0.80 (interquartile range (IQR): 0.73–0.86) for discriminating between symptomatic individuals who were positive or negative for COVID-19. This performance, according to the research team, is "significantly better ($P < 0.01$) than a model that considers symptoms alone (AUC = 0.71; IQR: 0.63–0.79)".

While one third of participants who tested for COVID-19 had a resting heart rate (RHR) greater than two standard deviations above the average baseline value during symptoms, the change in RHR on its own did not allow significant discrimination between COVID-19 positive and negative cases.

In contrast, the sleep and activity of COVID-19 positive participants were impacted significantly more than COVID-19-negative participants. Sleep and activity were slightly correlated, with a negative correlation coefficient of –0.28, $P<0.01$, the study found.

Currently, screening practices for COVID-19 typically include a combination of symptom and travel-related survey questions and temperature measurements. Experts say this method is likely to miss pre-symptomatic or asymptomatic cases, which make up about 40-45% of those infected with SARS-CoV-2, and who can still be infectious. For instance, an elevated temperature (>100 °F (>37.8 °C)) is not as common as frequently believed, being present in only 12% of individuals who tested positive for COVID-19.

"A strategy of test, trace and isolate has played a central role in helping control the spread of COVID-19. However, testing comes with many challenges, including the enormous logistical and cost hurdles of recurrently testing asymptomatic individuals," study authors note. "A refined predictive model, based on personal sensors, could enable an early, individualised testing strategy to improve performance and lower costs."

Image credit: DragonImages via iStock

Published on : Wed, 4 Nov 2020