Infectious disease experts explore feasibility of coronavirus mobile app for instant contact tracing

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A team of medical research and bioethics experts at Oxford University are supporting several European governments to explore the feasibility of a coronavirus mobile app for instant contact tracing. If rapidly and

widely deployed, the infectious disease experts believe such an app could significantly help to contain the spread of coronavirus.

The Oxford University team has provided European governments, including the UK, with evidence to support the feasibility of developing a contact tracing mobile app that is instant, could be widely deployed, and should be implemented with appropriate ethical considerations. The Oxford University team recommends that the mobile application should form part of an integrated coronavirus control strategy that identifies infected people and their recent contacts using digital technology.

Professor Christophe Fraser from Oxford University's Big Data Institute, Nuffield Department of Medicine, explains why a contact tracing app could be deployed with urgency: "Coronavirus is unlike previous epidemics and requires multiple inter-dependent containment strategies. Our analysis suggests that almost half of coronavirus transmissions occur in the very early phase of infection, before symptoms appear, so we need a fast and effective mobile app for alerting people who have been exposed. Our mathematical modeling suggests that traditional public health contact tracing methods are too slow to keep up with this virus."

Professor Fraser continues, "The instant mobile app concept is very simple. If you are diagnosed with coronavirus, the people you've recently come into contact with will be messaged advising them to isolate. If this mobile app is developed and deployed rapidly, and enough people opt-in to use such an approach, we can slow the spread of coronavirus and mitigate against devastating human, economic and social impacts."

Dr. David Bonsall researcher at Oxford's Nuffield Department of Medicine and clinician at Oxford's John Radcliffe Hospital, "Our findings confirm that not everybody has to use the mobile app for it to work. If with the help of the app the majority of individuals self-isolate on showing symptoms, and the majority of their contacts can be traced,

we stand a chance of stopping the epidemic. To work, this approach needs to be integrated into a national programme, not taken on by independent app developers. If we can securely deploy this technology, the more people that opt-in, the faster the epidemic will stop, and the more lives can be saved."

Dr. Bonsall explains why the current contact tracing strategy is no longer viable, "At the current stage of the epidemic, contact tracing can no longer be performed effectively by public health officials in the UK, and many countries across Europe, as coronavirus is spreading too rapidly. Our research of early data from other countries shows that patient histories are incomplete—we don't know the details of the person we sat next to on the bus. We need an instantaneous and anonymous digital solution to confirm our person-to-person contact history."

Professor Fraser highlights the urgency, "There are currently more daily cases in many small European countries than the whole of China. Our team is now preparing simulations for this mobile contact-tracing approach that could stop the epidemic with far less disruption than national or Europe-wide isolation. Our hope is to support communities with life-saving information as the pandemic worsens, or alternatively it could be used to release communities from large-scale isolation."

Professor Fraser's team at Oxford University's Big Data Institute are continuing to simulate performance of the application so it could be adjusted to include mobile app guided coronavirus testing, and provide targeted responses in areas with particularly high rates of transmission.

Professor Michael Parker, Director of the Wellcome Centre for Ethics & Humanities and Ethox Centre, in Oxford's Nuffield Department of Population Health adds his recommendations on ethics, "The use of any coronavirus mobile application requires high ethical standards throughout the intervention, including: guaranteeing equal access and

treatment; addressing privacy and data usage concerns; adopting a transparent and auditable algorithm; considering digital deployment strategies to support specific groups, such as health care workers, the elderly and the young; and, proceeding on the basis of individual consent."

The Oxford University team suggest the [mobile app](#) should be combined with social distancing measures to reduce close contacts. Dr. Bonsall recommends, "We need a variety of measures to slow the spread of infection before vaccines and antiviral treatments become available. A significant number of infections are being transmitted before symptoms start, so we need a fast and efficient system for alerting people when they have been exposed. Regular handwashing and hygiene remain important; in addition, people should follow any recommendations to reduce close contact with others, especially in densely populated areas. Combining these measures will help to reduce onward transmissions, which in epidemiological terms, reduces the reproductive number R; the average number of transmissions from infected individuals. If a country reduces R to less than one, the epidemic will decline and eventually stop."

Professor Fraser concludes, "Current strategies are not working fast enough to intercept transmission of coronavirus. To effectively tackle this pandemic we need to harness 21st century technology. Our research makes the case for a mobile application that accelerates our ability to trace infected people and provides vital information that keeps communities safe from this pandemic."

  More information: Visit: www.coronavirus-fraser-group.org for the science behind this work.

Provided by Oxford University Big Data Institute

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