Opinion Piece

DIGITAL HEALTH

Digital Health
Volume 6: 1–3

DOI: 10.1177/2055207620946193
journals.sagepub.com/home/dhj
SAGE

Digital Contact tracing in the COVID-19 Pandemic: A tool far from reality

Ajay Hegde[1] **and Ramesh Masthi**[2]

Abstract

Digital contact tracing applications are being developed by governments across the world, to track and trace contacts. With little evidence, citizens are being forced and made to believe that it is an important step in pandemic control. We discuss briefly if contact tracing will be successful in the control of the Corona virus pandemic or is it just a tool governments are using to cover their helplessness.

Keywords

Contact tracing, corona virus pandemic, COVID-19, digital health, general, privacy

Submission date: 6 May 2020; Acceptance date: 23 June 2020

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has reached pandemic potential, and governments and technology firms are keen to explore advanced tracking technologies to aid surveillance efforts. Contact tracing is the new 'digital technology' that has been in recent news as a promising tool to break the chain of infection. It has been implemented in India, with 50 million downloads within a fortnight, and is being promoted by the government as an essential step in pandemic containment. The National Health Service Digital (NHSX) and European Union are in the process of rolling out a similar platform in Europe, and rivals Apple and Google have joined hands to develop a unified contact tracing platform with forecasts of a promising 3 billion users. Unprecedented media publicity and promotion has made the common man believe that it could be the technological solution that could contain the coronavirus pandemic. Although recent technological interventions, previously unavailable, can make contact tracing feasible during the midst of a pandemic, their scientific application needs further analysis.

While privacy activists have voiced concerns about data privacy and location tracking, consumers have set aside concerns they would express in safer times and are racing to use these applications. Epidemiologists have cautioned about the constraints of inadequate testing and reluctance of users to participate.

Contact tracing has been the pillar of communicable disease control in public health for decades. It has been successful in the eradication of smallpox and control of polio and Ebola outbreaks across the world.[1] The primary reason for the success of contact tracing in these situations was the endemic nature of the disease, faecal-oral route of transmission of Ebola and polio, and disease of close contacts in smallpox.[2] Vaccination was the undercurrent of control strategy, with contact tracing in all these diseases. When contact tracing was applied to epidemics like the H1N1 Influenza outbreak of 2009, it failed to control disease or identify all contacts.[3,4]

Contact tracing is of high importance in the early stages of an epidemic, when community spread has not taken place. Mathematical model-based estimates

[1]Queen Elizabeth University Hospital, NHS Greater Glasgow and Clyde, Glasgow, UK
[2]Kempegowda Institute of Medical Sciences, Bangalore, India

Corresponding author:
Ramesh Masthi, Kempegowda Institute of Medical Sciences, Bangalore, India.
Email: ramesh.masthi@gmail.com

suggest that SARS CoV-2 has an R_0 value of 2.5, and that about 70% of contacts will have to be successfully traced to control early spread. However, there is concern in the scientific community whether a pathogen with an R_0 of 2.5–3 could engulf the planet in 3 months, and a belief that, taking into account asymptomatic carriers, R_0 may rise to as high as 15.4.[5]

Singapore was the first government to recommend its citizens to use their TraceTogether contact tracing platform. Although implemented in the early phase of the pandemic, it was installed by a million, which roughly translates to only 1 in 6 individuals. After a month's usage of the application in a relatively stable COVID-19 country, experts have already voiced concerns about the fact that false positives and false negatives have real-life (and death) consequences.[6]

Technologists should understand that the dynamics of COVID-19 spread is multifactorial, and cannot be defined simply by an algorithm of being in contact for >15 min within 2 m.[7] In a previous H1N1 pandemic, a flight-related transmission study from the United Kingdom (UK) showed no change in attack rate in passengers seated within two rows or further from an infectious case.[3] Transmission via fomites might be possible as the virus can remain viable and infective in aerosols for hours and on surfaces for up to days.[8] This was recently echoed after a Washington Choir super spreader event confirmed that 45 of its members tested positive in spite of practising social distancing. Contact tracing apps would never pick up these cases as they do not account for factors beyond proximity, like environment and activity. A person could be flagged as having been in contact with an infected person through an app, but it could have been someone standing across a barrier. Healthcare workers would be flagged as high risk, increasing the emotional and psychological burden they are already combating.

Initial reports suggest that nearly half of carriers may be asymptomatic are being confirmed by extensive testing in countries.[9,10] There is also a great deal of uncertainty for how long individuals are infectious before symptom onset, and whether subclinical infection occurs.[11] The elderly and children may not have access to technology for contact tracing, leaving a large population unaccounted for. Short-duration encounters in enclosed spaces without fresh ventilation often constitute close contact, even if encounter proximity and duration do not meet algorithmic thresholds. These factors will make contact tracing result in a lot of false negatives. Further, the authority to confirm and flag confirmed positive infection is not well laid out in the absence of a single body and fragmented health care providers. Confirmation of infection status may be the least concerning thing to do when one is sick with this deadly virus, thus leaving several cases off the radar.

While primary Bluetooth tracking remains anonymous, with meaningless data exchange, it could expose the user to several other threats and malware. The tool could leave dangerous open doors for misuse and hacking, although the use and abuse of data have been repeatedly questioned, and governments and companies have given assurances that the technology will not be used to track individuals after the pandemic.

Analysis of individual contact patterns suggests that contact tracing can be a successful strategy in the early stages of an outbreak, when endemic to communities, to prevent spread.[12] With the pandemic reaching 2 million confirmed cases, tracking community spread and hotspots using real-time geoinformation systems may be more relevant than contact tracing.[13] Hyperlocal (postal code)-based tracking can provide valuable information about communities, tracking sentinel sites.[14]

While mathematical models have proven contact tracing to be a viable solution, more pragmatic medical and epidemiological thought needs to be put in before conglomerates and governments push billions of users to use technology that has little scientific evidence amid a pandemic. It would perhaps add to the paramount confusion among the general population. The big question remains whether apps that monitor and track should undergo regulatory approval before they can be put to use in these testing times.

Conflicting interests: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The author(s) received no financial support for the research, authorship, and/or publication of this article.

Guarantor: AH, RM.

Ethical Approval: NA

Contributorship: Ajay Hegde was involved in primary draft, Ramesh Masthi was involved in correction and revisions.

Peer Review: This manuscript was reviewed by reviewers, the authors have elected these individuals to remain anonymous.

ORCID iD: Ajay Hegde https://orcid.org/0000-0001-6970-2260

References

1. Porco TC, Holbrook KA, Fernyak SE, et al. Logistics of community smallpox control through contact tracing and

ring vaccination: a stochastic network model. *BMC Public Health* 2004; 4: 34–20.
2. Eichner M, Dietz K. Transmission potential of smallpox: estimates based on detailed data from an outbreak. *Am J Epidemiol* 2003; 158: 110–117.
3. Young N, Pebody R, Smith G, et al. International flight-related transmission of pandemic influenza A(H1N1) pdm09: an historical cohort study of the first identified cases in the United Kingdom. *Influenza Other Respir Viruses* 2013; 8: 66–73.
4. Shankar AG, Janmohamed K, Olowokure B, et al. Contact tracing for influenza A(H1N1)pdm09 virus-infected passenger on international flight. *Emerg Infect Dis* 2009; 20: 118–120.
5. Aguilar JB, Faust JS, Westafer LM, et al. Investigating the impact of asymptomatic carriers on COVID-19 transmission. medRxiv 2020.03.18.20037994.
6. Bay J. Automated contact tracing is not a coronavirus panacea. blog.gds-gov.techhttps://blog.gds-gov.tech/automated-contact-tracing-is-not-a-coronavirus-panacea-57fb3ce61d98 (2020, accessed 15 April 2020).
7. Keeling MJ, Hollingsworth TD, Read JM. The efficacy of contact tracing for the containment of the 2019 novel coronavirus (COVID-19). medRxiv 2020.02.14.20023036.
8. van Doremalen N, Bushmaker T, Morris DH, et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. N Engl J Med 2020; 382: 1564–1567.
9. Qiu H, Wu J, Hong L, et al. Clinical and epidemiological features of 36 children with coronavirus disease 2019 (COVID-19) in Zhejiang, China: an observational cohort study. *The Lancet Infectious Diseases* 2020; 20: 689–696.
10. Nishiura H, Kobayashi T, Suzuki A, et al. Estimation of the asymptomatic ratio of novel coronavirus infections (COVID-19). Int J Infect Dis 2020; 94: 154–155.
11. Backer JA, Klinkenberg D, Wallinga J. Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20–28 January 2020. Euro Surveill 25: 330.
12. Anderson RM, Heesterbeek H, Klinkenberg D, et al. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* 2020; 395: 931–934.
13. Musa GJ, Chiang P-H, Sylk T, et al. Use of GIS mapping as a public health tool – from cholera to cancer. *Health Serv Insights* 2013; 6: 111–116.
14. Hegde A, Masthi R, Krishnappa D. Hyperlocal Postcode Based Crowdsourced Surveillance Systems in the COVID-19 Pandemic Response. *Front. Public Health Frontiers* 2020; 9: 2596.