Automated Contact Tracing: Is It Efficient?

Contract tracing apps all of a sudden have proliferated as these digital tools are increasingly used, alongside other infection control measures, in battling the COVID-19 pandemic. However, results of a new systematic review (Braithwaite et al. 2020) suggest the usefulness of such apps in identifying or notifying contacts of an infected person may be overhyped.

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The review team, composed of University College London (UCL) researchers, perused 110 full-text studies, although only 15 studies were included in the final analysis and quality assessment. These were observational, interventional, modelling and case studies on automated or partly automated contact tracing in humans.

Based on the results, the review team says there is no empirical evidence that shows digital apps or automated contact tracing systems were effective as regards the number of contacts identified or reduction in incidence of transmission.

In fact, in one study comparing the modelled effectiveness of manual contact tracing with automated approaches, manual contact tracing has been found to reduce Reproduction number (R) – the number of secondary cases infected by an infectious person – even better than automated tracing. Meanwhile, studies of partly automated contact tracing generally reported more complete contact identification and follow-up compared with manual systems.

Contact tracing, when done manually, can be resource-intensive and time-consuming. And data collected may not be accurate due to human factors – e.g. forgetfulness or incorrect recall of contact events by COVID-19 cases; patients' withholding vital information to protect relatives or friends; the time taken to notify contacts manually, etc.

In their systematic review, the UCL team identified seven studies of automated contact tracing based on mathematical models, with five studies focussing on smartphone apps. The other studies were related to other wearable or mobile devices.

While automated contact tracing can potentially help to reduce transmission, this can be achieved with sufficient population uptake, the review team explains. In four of seven modelling studies included in the review, it is estimated that controlling COVID-19 requires a high population uptake of digital/smartphone apps ranging from 56% to 95%, typically combined with other infection control measures.

However, as noted by the review team, the potential benefits of automated contract tracing systems should be weighed against the implementation costs and broader issues, such as data privacy and equity. It is worth mentioning that some populations that are heavily impacted by the COVID-19 pandemic – i.e. the elderly, people who are homeless, and the poor – likely do not own a smartphone or have access to technology/internet. As such, contact tracing apps are less likely to reduce transmission within their social circles.

"Decision makers should also ensure that, where automated contact-tracing systems are implemented, they are thoroughly evaluated and their use is within the context of comprehensive, integrated outbreak prevention and response plans," the UCL team points out.

In summary, the results of the systematic review highlight the need for more studies to strengthen the evidence base for automated contact tracing. Future research should also investigate the integration and relative effects of manual and automated systems.

Source: The Lancet

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