Ada Lovelace Institute

Rapid evidence review
20 April 2020

Exit through the App Store?

A rapid evidence review on the technical considerations and societal implications of using technology to transition from the COVID-19 crisis

This rapid evidence review sets out proposals for whether, and how, the UK Government should use technology to transition from the COVID-19 global public health crisis.

It examines the potential development and implementation of technical solutions to support symptom tracking, contact tracing and immunity certification. In doing so, its analysis takes into account societal, political, legal and ethical perspectives, and gives findings and recommendations for the transition and rebuild phases that follow containment, delay and mitigation.

More than at any other time, technologies deployed during national and international crises must enjoy public trust and support in order to fulfill their potential usefulness. That is particularly the case when the widespread uptake of technologies is critical to their success. In order to ensure that data-driven interventions in the present crisis are designed, deployed and governed in a way that is consistent with public expectations, respectful of human rights and in the public interest, the legal, ethical and technological questions they raise must be considered in advance.

About this review

This rapid evidence review explores the legal, societal and technological impacts of certain data-driven technologies, in order to understand their ethics and their impact, with a particular eye on the societal impact of technologies on inequality and vulnerable groups. This review focuses on three technologies in particular:

Digital contact tracing applications: a computer program that can be installed on a user's personal device, which determines when a person has come into contact with a person or number of persons infected with COVID-19, and subsequently notifies either the person or a public health authority to provide guidance or instructions. The purpose of digital contact tracing applications is to support efforts to control the spread of the disease and better target isolation measures.

Symptom tracking applications: a computer program, either installed on a user's personal device or accessed via a website, which asks users to submit details of their symptoms, and optionally, other data such as name, geographical location, GPS location, IP address, social media credentials, age, gender, occupation, medical history, household information, etc. The purpose of symptom tracking applications is to increase understanding of the disease, support research and understand its spread.

Digital immunity certificates: a digital token or other form of authentication that a person has been infected with coronavirus disease in the past and is now presumed to have a form of immunity for a period of time. The purpose of digital immunity certificates is to enable people at no risk of further infection of the disease to return to work, care for the ill and begin to restore the capacity of social, economic and health systems.

This review is authored by the Ada Lovelace Institute, a research institute and deliberative body with a remit to ensure that data and AI works for people and society, and is informed by the input of more than twenty experts drawn from across a wide range of domains, including technology policy, human rights and data protection, public health and clinical medicine, behavioural science and information systems, philosophy, sociology and anthropology.

The Ada Lovelace Institute is an independent institution which seeks to ensure that the public interest is represented in debates around the use of technology. This review makes pragmatic recommendations on issues of data and technology to support well-informed policymaking in response to the crisis. It has been prepared in the context of a fast-moving crisis in which our understanding of the disease, our access to evidence about it and the impact of responsive measures, and government policy is changing rapidly.

It makes recommendations to Government and the NHS, Parliament and the public about how to ensure that data-driven interventions ameliorate, rather than exacerbate, the crisis.

The many technical limitations of digital contact tracing led Singapore's product lead for the TraceTogether app, Jason Bay, to conclude:

> 'The experience of Singapore's contact tracers suggest that contact tracing should remain a human-fronted process. Contact tracing involves an intensive sequence of difficult and anxiety-laden conversations, and it is the role of a contact tracer to explain how a close contact might have been exposed — while respecting patient privacy — and provide assurance and guidance on next steps.
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> 'A human-out-of-the-loop system will certainly yield better results than having no system at all, but where a competent human-in-the-loop system with sufficient capacity exists, we caution against an over-reliance on technology.'[25]

However, digital epidemiologists Marcel Salathé and Ciro Cattuto note that the contagious nature of COVID-19 also creates an important role for digital contact tracing compared to traditional contact tracing:

> 'Normally, contact tracing is done through interviews. But interviews alone can be problematic because i) they are slow, ii) they are difficult to scale because of resource requirements (e.g., required human effort), and iii) a "contact" in the case of a respiratory disease may be anyone who has been in close-range physical proximity (i.e. 2 meters) for some time (i.e. a few minutes). This can of course include strangers which one would never be able to recall in a traditional interview. Digital proximity tracing through apps could help solve these problems.'[26]

25 Bay, J. (2020). Automated contact tracing is not a coronavirus panacea. *Government Digital Service blog*. Available from: https://blog.gds-gov.tech/automated-contact-tracing-is-not-a-coronavirus-panacea-57fb3ce61d98 [Accessed 16.4.20].

26 Salathé, M, Cattuto, C. (2020). COVID19 Response – What data is necessary for digital proximity. *Digital Epidemiology Lab Occasional Paper*. Available from: https://github.com/digitalepidemiologylab/COVID-documents/blob/master/COVID19%20Response%20-%20What%20Data%20Is%20Necessary%20For%20Digital%20Proximity%20Tracing.pdf [Accessed 16.4.20].

Recommendations

Finding: There is currently insufficient evidence to support the use of digital contact tracing as an effective technology to support the pandemic response. The technical limitations, barriers to effective deployment and social impacts demand more consideration before digital contact tracing is deployed.

Recommendation: Government must establish an independent Group of Advisors on Technology in Emergencies to oversee the development and testing of any prospective digital contact tracing app. The Group of Advisors should be charged with adjudicating when a digital contact tracing app is ready for deployment, taking into consideration:

- Evidence establishing the need for digital contact tracing to support manual contact tracing;
- The widespread availability of coronavirus testing for the general population;
- The potential for the app to achieve wide and consistent use among more than 60% of the population;
- A comprehensive understanding of the data architecture underpinning the app.

The remit of the Group of Advisors must include the ability to stipulate:

- The parameters against which the risk-scoring algorithm integrated into the digital contact tracing app detects and scores contacts;
- What technical features a digital contact tracing app should have in order to render the most useful data;
- What design features a digital contact tracing app should have in order to make it accessible and ensure compliance with its instructions;
- Privacy-preserving measures that the digital contact tracing app should integrate.

Finding: If a digital contact tracing app is approved for deployment, it will only be effective if used as a tool to supplement and assist manual contact tracing (performed by medical professionals on the basis of interviews with patients) and if based on confirmed diagnostic tests for the virus.

Recommendation: Resources must not be diverted from manual contact tracing or diagnostic testing to technology development. The deployment of a digital contact tracing app should be delayed until system capacity for testing and manual contact tracing is increased sufficiently to meet an increase in demand caused by the roll-out of the app. Testing and manual contact tracing capacity must be sufficient to cover those segments of the population who are digitally excluded because of their age, disability, vulnerability, device ownership or digital literacy.