Understanding Contact Tracing: The technology, the use cases, and the risks

Governments around the world are considering the deployment of contact tracing technologies to help contain the spread of COVID-19 and mitigate its economic impacts. Different options for designing these technologies exist, but each design decision leads to trade-offs between accuracy, adoption, usefulness, and privacy risks. To understand trade-offs and feasibility, Alex Berke and Kent Larson of the MIT City Science team outline current technologies, implementation strategies and potential risks in their new white paper titled Contact Tracing Technologies: Methods and trade-offs.

The white paper reviews contact tracing technologies as a longstanding public health strategy for reducing the spread of infectious disease by identifying people who may have been exposed. Traditional contact tracing is conducted person to person, with the infected person recalling and listing their recent locations and the people with whom they may have come into contact. Now, technology is aiding in the process adding efficiency and accuracy while also enhancing the existing human-driven initiatives. Use of this more effective contact tracing, when combined with increased testing, offers an opportunity to improve policy decisions by providing information to help safely re-open the economy and intervene only when new outbreaks are detected.

In addition to reviewing how current contact tracing systems work, the authors explain how future alternatives could work instead. They cover a range of methods in terms of how data is used to detect contacts, how trust and the flow of information is managed, how positive cases are reported, and how exposure risk is assessed and how it impacts users.

How these differences in methods are used will lead to trade-offs between adoption, accuracy, usefulness to individuals, public health authorities and decision makers and, of course, privacy.

To understand these trade-offs, Berke and Larson explore the attributes of effective contact tracing which, when combined with increased testing, offers an opportunity to improve policy decisions by providing information to help safely re-open the economy. Berke states, “The public should understand how these systems function, and what their alternatives are, because their widespread adoption may drastically change how we move or work in public and the degree to which we can live in privacy.”

Adoption, accuracy of data, and the usefulness of these methodologies to health authorities and decision makers are considered as well. The authors also address privacy issues involved when information necessary to stopping spread of the disease is provided to authorities, potential contacts and others in the community.

In conclusion, Berke and Larson leave you with information as well as questions about the usefulness of these technologies as well as their trade-offs for potential but as-yet unmeasured benefits.