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Digital Contact Tracing: Case Study from Spain

A new research looks into the use of digital contact tracing (DCT) technologies during the pandemic, based on a real-life controlled experiment in Spain.

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While several countries have deployed DCT applications, to date there is no evidence that such digital solutions are effective. Among others, this leads to increased public distrust, low adoption rates and concerns around privacy.

Over a course of four weeks between June and July 2020, a team of researchers set a population-based controlled experiment in San Sebastián de La Gomera, a town with 10,000 inhabitants in La Gomera, Canary Islands (Spain), to study how the Spanish DCT app, Radar Covid, affected the epidemiological situation on the island.

Radar Covid is a bluetooth-mediated DCT technology based on the Apple/Google protocol and was designed specifically for the DCT purposes during the pandemic. It conforms to the European legal standards, including the GDPR, is opt-in, does not require authorisation or any identification, can be removed at any moment, uses DP3T protocol to interact with other devices and stores data only temporary. Importantly, if an individual tests positive for COVID-19, they are provided with a code, which they may feed to the app. In this case, all individual's contacts will receive a relevant notification.

The experiment aimed to validate the app's technical viability in the real-life setting and its epidemiological impact. After a promotional campaign in media, the team simulated a total of four epidemic outbreaks focussing on different parametrisations, such as different asymptomatic times, Bluetooth calibrations and different mobility patterns. For subsequent analysis data were retrieved from the server, survey results and follow-up calls (all anonymous and privacy-preserving).

The app's efficiency was measured against seven KPIs: five assessing the user behaviour (adoption, adherence, compliance, turnaround time, follow-up), and two assessing the effectiveness (overall detection, hidden detection). Due to privacy-by-design limitations, the authors were not able to quantify certain parameters. Their key estimations include:

- Rate of adoption of 33%
- High adherence rate
- Compliance rate of about 64% (61% for primary infections and 88% of secondary infections). Of those, 98% complied with no delay
- Average detection rate of 6.3 close-contacts per primary case
- Hidden detection significant (23% - 39% of secondary cases pointed to contacts with strangers as the source of infection)

Overall, the results suggest that DCT may be useful during an epidemic outbreak in a real population. The adequate level of adoption can be achieved through communication campaigns. The technology could complement manual contact tracing and other non-pharmaceutical interventions. However, the authors point out some limitations, including the simulated infections, which might have affected the participants' behaviours.

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