THE ROLE AND CHALLENGES OF USING DIGITAL TOOLS FOR COVID-19 CONTACT TRACING

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Abstract

This aim of this study is to understand the role of digital tools used for COVID-19 Contact tracing and the challenges faced during the implementation of such tools. Contact tracing represents a concept adopted by governments around the world to control the spread of COVID-19. Using digital tools in contact tracing is far more effective than mass quarantine, as it addresses challenges tracers face during conventional contact tracing. Using literature review as the research methodology, related literature was retrieved from different databases such as Google Scholar and ProQuest, shortlisted according keywords and phrases and studied for information focused on answering the research questions. The findings revealed that despite the challenges, digital tools remain significant in controlling the spread of COVID-19. Some of the challenges include the inability to reach children and people who do not own smartphones, or lack access to mobile networks and required technology in locations they live in. Another challenge is surveillance creep brought on by the fear of the breach of privacy through the use of such digital tools.

Keywords: Contact tracing, digital tools, Covid19 virus, survellaince creep

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1. Introduction

All over the world, nations have been to step up their response to the COVID-19 pandemic, with the majority being ad hoc, with long lasting consequences. Whatever measures, whether ad hoc or well-planned had only one purpose in mind; ensuring today's efforts safeguard the future health of citizens. However, of all the measures put in place, according to Calvo et al. (2020), the most significant transformations emanate from new health surveillance technologies. The transformation involves using machine learning and automated decision-making technologies to deconstruct people's digital footprints, persons potentially infected, trace contacts and ensure social distancing (Van Laar et al., 2017). Calvo et al. (2020) assert that such digital contact tracing is considered more effective than mass quarantine, currently implemented by many countries.

The World Health Organization Report on contact tracing reveals that the use of digital tools in contact tracing is an important public health measure and critical element used to control the spread of the virus. Contact tracing breaks the human-to-human transmission trace by identifying those exposed to confirmed cases, quarantining and following up to achieve rapid isolation (World Health Organization, 2020a). The contacts are then tested and treated if they develop symptoms. The systematic and effective implementation of contact tracing actions reduce numbers of new cases (World Health Organization, 2019) which is the ultimate aim of the measures implemented to deal with this hitherto unforeseen magnitude of this pandemic.

2. Purpose of the Study

The purpose of this study is to investigate the extent of current usage of digital contact tracing tools and challenges, especially the fear of surveillance creep, to the continued use of such tools. Another aim is to unveil the contribution of technology to the development and application of these digital tools in this area.

3. Research Question

3.1 How are countries using digital tools to solve the challenge of reaching contacts and COVID-19 cases in a location during contact tracing?

3.2 What approach can governments use to eliminate fears against surveillance creep?

3.3 What is the significance of Smartphone, Android and iOS in the implementation of digital tools in contact tracing?

4. Research Methodology

The research design for this study is wholly qualitative where a fairly extensive literature review was used to collect, check and re-analyse data from current work done in this area. A literature review is the most appropriate method because a specific issue is defined and the literature is subjected to a focused analysis for all related information that can be synthesized to draw out the most pertinent information to shed light on the topic of investigation. For this study, critical information of current knowledge was gleaned on significance of the digital tools, the challenges the digital tools face during the contact tracing period, the problems that may arise when using the tools and future implications and recommendations to manage the identified challenges. The review used information from scientific journals, electronic bibliographic data bases, academic dissertations and books (Workman et al. 2020). The electronic databases used to cull the literature included ProQuest, SciELO, Google Scholar, Science.gov and PsycCOhost, alongside authentic sites of approved bodies such as WHO, the European Union, America's Health institutions as well as grey literature. The initial step included reviewing abstracts of the identified materials to ascertain their suitability to be included in the literature review. The references of selected works were also studied to guide the authors to more related literature.

Keyword and phrases were used to delimit the search and these included 'Contact Tracing for COVID-19', 'Digital tools', 'Contact Tracing', 'Interoperability between iOS and Android', 'Bluetooth-based contact tracing', 'COVID Outbreak response tools', and 'Proximity tracing tools'.

The publications were vetted individually to establish specific digital tools used in contact tracing for COVID-19, with the key words used being "Digital Tools" and "Contact Tracing" in the mentioned database (Golan et al., 2020).

5. Discussion

5.1. Contact Tracing for COVID-19

Contact tracing is a public health practice implemented when responding to infectious diseases. According to Simpson and Conner (2020), state and local public health systems perform contact tracing for many conditions such as syphilis and tuberculosis. Conventionally, when public health officials receive information about a positive test of infectious conditions, they collect contact information of the individual that tested positive. The staff perform contact tracing by reaching out to the individuals using a phone, asking about their condition and interviewing them to establish the people they have been in close contact with in order to manage the attributes of the pathogen. Authorities would then notify close contacts, asking

them to isolate and seek medical attention. According to Simpson and Conner (2020), contact tracing reduces the spread of infectious diseases by identifying, informing and isolating individuals purported to be infected before they contribute to the spread of the pathogen.

With regard to contact tracing of COVID-19, the process involves identifying individuals who may have been exposed to someone with Covid-19 and making a 14-day follow-up from the last exposure points. Contacts are required to self-quarantine for 14 days, which represents a monitoring period, aimed at limiting the possibility of exposing others to the virus, in case they get ill. Essential elements to consider when implementing contact tracing include positive response from public, community involvement, careful planning to meet local contexts and culture among societies. It is also important to train contact tracers and health providers, for successful logistics of the contact tracing teams. Additionally, there is a need to have effective information systems used to collect, manage and analyse data in real time (Beaunoyer et al., 2020).

During contact tracing, the tracers could face challenges, among them incomplete identification of the contacts, inefficiencies caused by the use of paper-based reporting forms and complex data management needs. According to Lenca and Vayena (2020), other challenges include delays in steps to initiate contacts identification up to isolation of suspected cases among the picked contacts.

5.2. Using Digital Tools to Overcome Contact Tracing Challenges

Digital tools help to overcome challenges of a contact tracing programme, when integrated in an operational public health system with well-trained health service personnel, testing services and manual contact tracing infrastructure. According to Simpson and Conner (2020), COVID-19 contact tracing requires effective state coordination. Google and Apple are involved in the creation of new de facto international standards to help in contact tracing. The two companies have a technology supporting basic interoperability between apps developed by public health officials in different states and countries. Many states, private firms, learning institutions and independent groups have been involved in the creation of digital tools that have enhanced contact tracing since the COVID-19 virus became rampant. This has been enhanced by the interoperability between iOS and Android, which allows the public health officials to develop digital contact tracing apps.

This supports Bluetooth-based contact tracing, with key restrictions removed at OS level. According to Simpson and Conner (2020), with Apple and Google mobile OS covering global markets through smartphones, this digital technology has become literally a lifesaver in controlling the spread of COVID-19. The technology proposed by Apple and Google offers a

privacy-protective baseline that public health officials in different countries and states could build upon to ensure successful voluntary contact tracing apps, as long as privacy concerns are met in the entire design and implementation.

5.3. Key Considerations during Digital Tools Classification in Contact Tracing

In responding to the COVID-19 pandemic, many digital tools have been developed and deployed to identify cases and initiate contact tracing. The tools help respond to outbreaks, engage in proximity tracing and symptom tracking, combined as a single instrument or utilized as stand-along tools. According to the World Health Organization (2020a), outbreak response tools facilitate the process for public health officials engaging in contact tracing and outbreak examination. The process involves managing complex relational data of COVID-19 cases and associated contacts using electronic data entry of confirmed cases and contact information. The outbreak response tools help in facilitating all elements of contact tracing such as case investigation, listing and monitoring the contacts. Hence, outbreak response tools support automating examination and performance monitoring (Jnr, 2020). Outbreak response tools are integral in managing dynamic relationships between cases and contacts, because they are linked to multiple cases and could transform into cases generating additional contacts.

Accordingly, there is need to optimize outbreak response tools to help the contact tracers with their workflow and support the functionality of supervisors in monitoring contact tracing implementation. An example of the outbreak response tool includes Go.Data. The WHO developed a Go.Data software system in partnership with the 'Global Alert and Response Network' to help field workers (World Health Organization, GoData 2020). The app is currently used in many countries to manage COVID-19.

On the other hand, proximity tracing or tracking tools use GPS and Bluetooth to locate and trace movements of contacts and persons thought to have been exposed to the virus from an infected individual. In their research Gasser et al. (2020) established that COVID-19 exposure risk relies on the probability of moving in close - less than a meter - or continuous contact with infected persons. Nonetheless, proximity on its own does not provide a complete analysis of an exposure, because it could vary without proximity determined if an individual in in an enclosed or open-air space (World Health Organization, 2020b). Therefore, there is a need for future studies to analyse the benefits of proximity tracing tools during contact tracing (World Health Organization, 2020a). Another area of focus should be on feasibility and required thresholds to support scale implementation.

Proximity tracing tools are categorized as centralized or decentralized, allowing processing of contact tracing centrally by a health body or personal devices. Nevertheless, it

is important to address privacy concerns regarding disclosing personal data. Gasser et al. (2020) explains that the use of digital tools face many ethical and legal constraints when used in disease surveillance and control, because of the unclear laws and regulations, thus making its implementation challenging.

According to Ekong et al. (2020), the potential contribution of the tools relies on the wide scale adoption of the same and availability of smartphones, reliable connectivity and accessibility. Limitations associated with proximity tracing tools include exclusion of children and people who do not own a smartphone or those living in remote areas with minimal or no connectivity. Conventionally, proximity tracing conflicts with contact tracing, but in general contact tracing is associated with a public health initiative, while proximity tracing represents a technique essential in supporting contact tracing (World Health Organization, 2020c).

5.4. Examples of Digital Technology Implemented Across the World for COVID-19 Contact Tracing

Many countries have invested heavily in technologies to control the spread of COVID-19. The Israeli government authorized the repurposing of an anti-terror phone tracking system into an app which has helped the Israeli government to trawl the location histories of the entire population, monitor and enforce self-isolation of those who tested positive. Additionally, Israel's health ministry developed an app that permitted citizens to confirm if they met any infected person and should self-isolate.

China used Alipay and WeChat to combine users' health, location and financial ability in generating personal infection risk rating. The government and private businesses continue to use the technologies to decide if it is safe to allow a person to access shops, transport and public spaces (Liu et al. 2020). On the other hand, the US government is in discussion with Google, Facebook and Clearview AI to use location data mining and facial recognition to trace infected persons, monitor and implement isolation (Gillmor, 2020).

5.5. Surveillance Creep Associated with Digital Tools

Surveillance creep is defined as surveillance developed for a specific reason such as collecting traffic violations which is now a permanent feature globally and which may include combating a pandemic. Scholars believe that too much surveillance accepted today may be forced on populations as a permanent way of living, which could promote potential injustices, violate human and civil rights and create enormous psychological challenges. According to Simpson and Conner (2020), societies prefer environments to take care of their psychological feelings such as autonomy and freedom of speech and choice. Any violation of privacy caused by over-surveillance is viewed with hostility. Simpson and Conner (2020) explain that such

fears make it hard for people to accept the use of digital tools in fighting coronavirus, hence impeding their efficacy in fighting this pandemic.

Surveillance, especially too much of it, instils the fear of external control and a means to thwart autonomy, negatively affecting people's motivation to fight the pandemic because it interferes with their wellbeing (Judson et al. 2020). Not surprisingly, there are a large number of people who choose to evade such surveillance to reassert their autonomy, for example South Korea. The South Korean government was using apps to publicize people's movements in relation to the pandemic, but this raised concerns of many people resulting in them keeping away from COVID-19 tests, hence inhibiting control of the virus.

6. Conclusion

Digital tools have a significant role to play in controlling the spread of COVID-19, currently, especially in the area of contact tracing. Tracing of contacts and cases to enhance quarantine and self-isolation is paramount in reducing the spread of the disease to those not infected, hence the significance of these tools. This study looked at key challenges digital tools face during contact tracing and examples of tools used globally to enhance contact tracing. The most significant includes the platform provided by Google and Apple for android and iOS platforms to offer a foundation for companies, countries and states willing to develop apps to use in contact tracing. The literature review has identified limitations associated with the use of digital tools, which include limiting freedom through surveillance creep.

The implication of this study is that the importance of digital tools to win the battle against this virus cannot be underestimated. Whether the fears associated with surveillance creep are grounded in actual experience or hearsay, the point is that such fears interfere with a sound and safe way to control and eradicate this virus. With the numbers of infected burgeoning in countries throughout the world, rejecting a tool that can control the spread of this avaricious virus that has already claimed millions of lives, because of imagined fears is unacceptable and irresponsible. Hence, the use of digital tools in contact tracing should be embraced with alacrity by every rational person whose main worry should be to see the virus contained and finally wiped out. Issues of privacy, while important, are surely secondary to life and death issues.

Acknowledgements

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