Digital Health During a Pandemic: Critical Analysis of the COVID-19 Contact Tracing Apps

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Abstract : Virologists and public health experts have been predicting potential pandemics from coronaviruses for decades. The viruses which caused the SARS and MERS pandemics and the Nipah virus led to many lost lives, but still, the COVID-19 pandemic caused by the SARS-CoV2 virus surprised many scientific communities, experts, and governments with its ease of transmission and its pathogenicity. Governments of various countries reacted by locking down entire populations to their homes to combat the devastation caused by the virus, which led to a loss of livelihood and economic hardship to many individuals and organizations. To revive national economies and support their citizens in resuming their lives, governments focused on the development and use of contact tracing apps as a digital way to track and trace exposure. Google and Apple introduced the Exposure Notification Systems (ENS) framework. Independent organizations and countries also developed different frameworks for contact tracing apps. The efficiency, popularity, and adoption rate of these various apps have been different across countries. In this paper, we present a critical analysis of the different contact tracing apps with respect to their efficiency, adoption rate and general perception, and the governmental strategies and policies, which led to the development of the applications. When it comes to the European countries, each of them followed an individualistic approach to the same problem resulting in different realizations of a similarly functioning application with differing results of use and acceptance. The study conducted an extensive review of existing literature, policies, and reports across multiple disciplines, from which a framework was developed and then validated through interviews with six key stakeholders in the field, including founders and executives in digital health startups and corporates as well as experts from international organizations like The World Health Organization. A framework of best practices and tactics is the result of this research. The framework looks at three main questions regarding the contact tracing apps; how to develop them, how to deploy them, and how to regulate them. The findings are based on the best practices applied by governments across multiple countries, the mistakes they made, and the best practices applied in similar situations in the business world. The findings include multiple strategies when it comes to the development milestone regarding establishing frameworks for cooperation with the private sector and how to design the features and user experience of the app for a transparent, effective, and rapidly adaptable app. For the deployment section, several tactics were discussed regarding communication messages, marketing campaigns, persuasive psychology, and the initial deployment scale strategies. The paper also discusses the data privacy dilemma and how to build for a more sustainable system of health-related data processing and utilization. This is done through principles-based regulations specific for health data to allow for its avail for the public good. This framework offers insights into strategies and tactics that could be implemented as protocols for future public health crises and emergencies whether global or regional.

Keywords : contact tracing apps, COVID-19, digital health applications, exposure notification system

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