

# A Study of Contact Tracing Applications for Containing the Spread of Covid-19- A Global Perspective

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**ABSTRACT-** In order to contain the spread of pandemic Covid- 19, most of the countries across the globe have come up with the contact tracing applications commonly known as “Contact Tracing Apps”. Transparency, privacy and security of user’s data are the major concerns that are associated with the successfulness of a contact tracing app. The success of a contact tracing app can be measured by looking at the segment of the population using the app. The Government of India launched Aarogya Setu as a mobile application to help to contain the spread of Covid- 19 by providing mechanisms to trace the contacts of an infected individual, so that the individuals who have come into the contact of an infected individual, can be isolated and quarantined as per the protocol issued by the government from time to time and thereafter can be medicated. Aarogya Setu Application serves as a preventive measure that one can take to keep himself/ herself informed, if the individuals whom he/ she has been in contact is not a Covid- 19 patient. Aarogya Setu is a technological endeavour undertaken by the Government of India that encompasses the software technology and internet technology. Majority of the countries across the world have adopted the technology based solutions for the purpose of contact tracing in the wake of Covid- 19.

**KEYWORDS-** Contact Tracing App, ICT, Digital Divide, Privacy.

## I. INTRODUCTION

Contact Tracing is not a new invention to contain a communicable disease, but it had been a solid weapon to combat such diseases, and it is in practice from decades [1]. However, the contemporary Contact Tracing is quite fast as it involves computing devices and ICT based infrastructure as compared to the traditional contact tracing that was more labour intensive and less technology based, as it involved the process of interviews and detective work. The present paper discuss the digital contact tracing applications that are in use in the wake of Covid- 19 and also discuss the factors that affect the successfulness of the contact tracing applications. A contact tracing application works backward starting from identifying the infected individuals to the identification of the individuals who have exposed to the disease by coming into the contact of an infected individual [2]. The success of a contact tracing app can be roughly measured by having a look at the number of individuals who have installed the application on their devices such as smart phones or any other such compatible digital devices. The Aarogya Setu app has been launched in India partly using push approach and

partly using the pull approach. In push approach, the organization which is responsible for implementing a particular policy or a service, makes the policy/ services to be mandatorily adopted by the intended users or the residents of the country, as the case may be. However, in a pull approach, it is not mandatory for the users/ residents of the country to use a particular service, and it depends upon the choice of the individuals, whether to use or not to use that particular service [3]. In the near past it is evident from various media reports, in which it was made mandatory by the government/ government departments for the individuals who wish to enter their premise that they must have installed and using the Aarogya Setu App on their smart phones and must be using the app, that clearly indicates that the Aarogya Setu app has been launched with the push approach [4]. However, it is not compulsory for the common citizens to install and use the app that satisfy that the Aarogya Setu app has been launched partly with the pull approach [5].

## II. RELEVANCE OF CONTACT TRACING IN THE WAKE OF COVID- 19

Due to the highly contagious nature of Covid- 19, the basic protocol to follow is the social distancing [6]. However, individuals have to go out from home inevitably to do various tasks related to professional life or personal life. This is where the role of a contact tracing application starts. The contact tracing app helps an individual to know if he has met with an individual who was infected with Covid or was having symptoms of Covid. It also helps the government bodies to take decisions, such as which region requires more testing of the residents for the purpose of identifying infection. The governments of many countries have come up with the digital contact tracing applications to help their residents to keep safe from pandemic and also to help governments to take various decisions, in order to efficaciously fight against the pandemic.

## III. GOVERNMENT ENDORSED CONTACT TRACING APPS IN INDIA, AUSTRALIA AND CANADA

In the month of April 2020, the Government of India launched the Aarogya Setu App to contain the spread of Covid- 19. The Aarogya Setu app has been centred on ensuring transparency, privacy and security of resident centric data, which is generated when the individuals use the app. In order to use Aarogya setu app, one has to download

it from the particular database systems such as google play store, Apple app store etc. and to install it in the smart phone. After installation it requires active GPS (Global Positioning System) and active Bluetooth, so that one could receive information about his/ her contacts who have been either infected or have the symptoms of Covid. The app also has a self- assessment feature, where an individual can provide the information about the symptoms of Covid, if he/ she feel such symptoms [7]. The app enables an individual to take appropriate action, if he/ she has met with the infected individuals or is in proximity of such contacts. More than 160 million individuals have downloaded the app [8], [9].



Figure 1: Symbol of Aarogya Setu App

The government of Australia has launched COVIDSafe app as a contact tracing app in April 2020. It is voluntary to install the app by the residents of Australia. It has been mandated by the government that the residents can delete the COVIDSafe app at any time, and it will delete the whole data about the app in the phone. The data about an individual who has enrolled once into the app, will be saved into the national COVIDSafe data store and will not be deleted automatically, if an individual deletes the app from the phone, unless the pandemic ends. However, the data about an individual can be deleted on his/ her request, by filling up the requisite application form provided by the government for the purpose [10]. In May 2020, the Parliament of Australia has amended the Privacy Act 1988 and passed the Privacy Amendment (Public Health Contact Information) Act to ensure the privacy of data related to the individuals who have enrolled into COVIDSafe and to support COVIDSafe itself. The COVIDSafe do not collect the information about the location of an individual. It has been provisioned by the government that the data collected will be used only by the health officials and police or other state or federal agencies will not have access to this data [11].



Figure 2: Symbol of COVID Safe app

The Government of Canada has launched the COVID Alert App in the month of July, 2020 to help people know if they have been exposed to an individual, who has been tested positive for Covid- 19. The COVID Alert App is basically an exposure notification app, rather than contact tracing app as it does not track the personal data such as location of the user, name or address of the user, rather it tracks the place or time when an individual was near another individual, who is already having infection of Covid. The app helps an individual to know in advance, before appearing any symptoms of coronavirus, about the possible exposures. The app can be voluntarily downloaded from the Google play store or the Apple Play Store. When a user of the app is diagnosed with Covid- 19, he/ she will receive a diagnosis key from the health department, which is to be entered into the app by the user himself/ herself. After the user enters the key, the app asks the user for his/ her permission to share the random code with the central server [12].



Figure 3: Symbol of COVID Alert App

#### IV. PERCENTAGE OF POPULATION USING CONTACT TRACING APPLICATIONS IN SELECT COUNTRIES

From the literature review it has been discovered that only a few segment of the population is using the contact tracing applications in the respective countries. According to [13], [14], around 12.5% of the population of India is using the government endorsed contact tracing app. Similarly in Canada, only a small fraction of the population, which is equal to 0.04% is using the government endorsed contact tracing app. Following graph represents the percentage of the segment of the population using the contact tracing applications in their respective countries

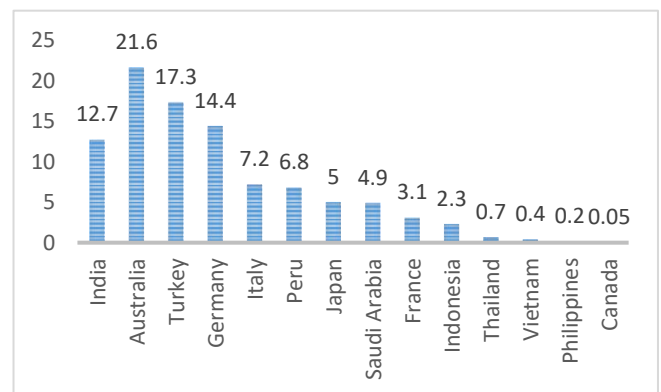


Figure 4: Worldwide Adoption of Contact Tracing Applications by the Individuals of the respective Countries

## V. FACTORS AFFECTING THE UNIVERSAL ADOPTION OF THE CONTACT TRACING APPLICATIONS

The major factors that affect the universal use of the contact tracing application by the entire population of a country are primarily the Privacy, availability of ICT infrastructure that creates the digital divide and illiteracy [15]. Privacy of the digital data about the individuals has remained one of the topmost issue, which is raised by the individuals as well as by the social organization throughout the world. The governments across the world have tried to apprise its residents that their personal data is kept secure by the concerned organizations. Digital divide is also a big bottleneck for the success of digital solutions for contact tracing applications to be implemented universally. The last, but not the least is the illiteracy that hinders the individuals across a country to accept the digital solutions for the purpose of contact tracing.

## VI. CONCLUSION

The present paper is an attempt to explore the significance of the use of contact tracing applications in a country. The paper also throw light on the poor state of acceptance rate of digital contact tracing applications by the residents of a country. The paper proceeds by identifying the factors behind the resistance for acceptance of the contact tracing applications by the residents of the country. A further research could be carried out to address various issues that affects the universal coverage of the population of a country by the contact tracing applications, so that risk of the contagious diseases like Covid- 19 can be reduced exponentially.

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