



EXPLORING USER-UPTAKE OF DIGITAL CONTACT TRACING (D-CT) APPS

A PRACTITIONER GUIDE

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ABOUT OUR LAB

Our research aims to shed insight into the different ways digital technologies are used in disasters and emergencies, the challenges and risks, and benefits and opportunities associated with digital technology use. We seek to provide strategies for guidance, and support efficacy-focused, ethical, low-risk interventions around the world. Our research adopts systems and complex networked perspectives, where we creating understanding through interconnectivity. We engage experts and organizations, both academic and practitioner, across disciplines to evolve research at the intersection of systems to enhance context-driven understanding.

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EXPLORING USER-UPTAKE IN D-CT APPS

MODULE 6.

Case Study. South Africa

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6.1. Study Overview

6.1.1 Background

At the onset of the COVID-19 pandemic, Digital Contact Tracing (D-CT) emerged as a complement to Manual Contact Tracing (M-CT) to help enhance the capacity of global health systems to track and control the rapid spread and impact of the virus. This innovative approach to contact tracing attracted global attention due to its immense potential to enable faster and more widespread tracing of the virus among symptomatic and asymptomatic infected populations, while also compensating for lower resource availability and physical distancing rules hindering face-to-face care. D-CT apps and interventions from eBracelets to QR codes surged around the world, in the hope that they would make a substantial impact on curbing the global spread of the virus.

To date however, little research exists demonstrating the true impact of these tools. Specifically, despite the widespread implementation of these tools, there is little evidence that shows that D-CT tools (most often apps) do more good than harm. Coupled with issues pertaining to human rights, privacy, efficacy, and digital inclusion, one of the major problems faced with D-CT interventions (mainly those that are voluntary) is the low level of user engagement in these apps – engagement meaning uptake of the app (download and registration), but also using and updating the app, reporting a positive diagnosis through the app, and reacting to an exposure alert received through the app (see our four-stage continuum of D-CT app engagement outlined in Module 1). Looking at uptake of D-CT apps alone, rates vary drastically across different contexts. Ireland and Iceland, for example, have the highest rates of countries studied at approximately 43% and 40% respectively, while places like Cyprus or South Africa fall below 1%. And, while many argue that any degree of uptake can make a difference,¹ the dominant perception is that all of these rates are insufficient to make a substantial impact on tracing and controlling the virus. In an effort to better characterize the relationship between user engagement and app effectiveness, taking into account there is currently no magic uptake number, research is needed to understand why user-uptake varies between countries.

Through a preliminary literature review and an interdisciplinary workshop, our research team found this problem can be partly attributed to the lack of recognition and understanding of the target users of these apps. Yet, little is known regarding what incentivizes versus inhibits people from downloading these apps around the world, how context plays a role, as well as the association of perceived benefits and risks with user engagement. As part of [The Digital Global Health and Humanitarianism \(DGHH\) Lab's](#) larger study on the factors impact user-engagement across the four-stage continuum, this study focuses specifically on trying to address this gap by exploring stage 1 – user-uptake of D-CT apps – across various countries.

¹O'Neill, P. (2020, June 5). No, coronavirus apps don't need 60% adoption to be effective. MIT Technology Review. Retrieved from <https://www.technologyreview.com/2020/06/05/1002775/covid-apps-effective-at-less-than-60-percent-download/>

6.1.2 Methodology

This research asks the following research question:

Why is there higher user-uptake of D-CT apps in some countries over others?

This question is addressed with the following sub-questions:

- i. How does uptake vary across contexts?
- ii. What factors influence uptake across contexts?
- iii. How does risk-benefit perception influence uptake?

To answer these questions, we first established the scope of our research. Our focus is on user-uptake of D-CT apps (the most prevalent form of D-CT interventions worldwide) implemented by governments around the world at the national level, that are voluntary to download, and primarily decentralized in their data collection (a measure that mitigates privacy and human rights concerns that are widely recognized as a factor that deters app engagement).² Second, a multiple case study approach was used to generate country-specific understanding of user-uptake of D-CT apps and address our research questions. Cases selected include: Iceland, Cyprus, Ireland, Scotland, and South Africa. Data was collected through interdisciplinary workshops, interviews, and meta-analysis of existing peer-reviewed and grey literature. Research findings were analyzed through a systems-approach based on Bronfennbrenner's ecological systems theory to identify varied contextual factors that influence uptake (through a risk-benefit lens).³ Bronfennbrenner's theory aims to define user behaviour as a product of intrinsic and extrinsic interactions and influences with different levels in their surrounding system: individual (micro-level), community (meso-level), and system (macro-level). Research findings are presented through a series of modules (identified in Section 6.1.4 below) through an introduction to D-CT and user-uptake; case study; systems analysis of factors identified that influence uptake; and recommendations and future research. For a more detailed overview of our research approach, please see the full methodology.

6.1.3 Overview of Cases & Factors Identified

As will be shown through the five case studies, **eight factors** that can explain uptake across the individual (micro), community (meso), and system (macro) level dimensions have been identified. Each factor is explained below.

1. **Perceptions of Data Collection & Management** - how people perceive actual data collection and management as it relates to privacy and trust; and individual understanding of privacy and security (independent of actual privacy and security measures built into D-CT apps).

²Lomas, N. (2020, April 6). EU privacy experts push a decentralized approach to COVID-19 contacts tracing. TechCrunch. Retrieved from <https://techcrunch.com/2020/04/06/eu-privacy-experts-push-a-decentralized-approach-to-covid-19-contacts-tracing/>

³ Wikipedia Contributors. (2019, February 10). Ecological systems theory. Wikipedia; Wikimedia Foundation. Retrieved from https://en.wikipedia.org/wiki/Ecological_systems_theory

2. **Sense of Community** - the level of shared trust, shared identity, sense of duty, and/or communitarian values individuals have in relation to their community; and the strength of ties/connectedness individuals have with each other.
3. **Communications & Misinformation** - the timeliness, transparency, method, and nature of information provided to the nation alongside the prevalence, spread, and control of misinformation.
4. **Accessibility & Inclusion** - the degree to which D-CT apps are equally accessible to, usable for, and inclusive of, the entire population, as well as the level of discrimination and marginalization that results from interventions that fail to account for the digital divide or socially vulnerable populations.
5. **Trust in Public/Private Institutions** - the widespread level of trust and faith in public institutions (e.g. government, response agencies) and private institutions (e.g. internet corporations like Google, Apple, as well as the developers of D-CT apps).
6. **Policy & Governance** - the use of, and adherence to, policies and governance mechanisms that regulate the development, implementation, and use of the app.
7. **Response Infrastructure** - the ability of the health infrastructure alongside the first-line response and emergency management infrastructure to manage the COVID-19 pandemic (such as access to testing, and the capacity to respond to and treat the virus).
8. **Digital Capability** - the ability of D-CT apps to effectively and efficiently serve their purpose and facilitate the management of the pandemic.

6.1.4 Practitioner Guide Outline

The findings of this study are presented through eleven modules including:

Module 00 – Executive Summary

Module 0 - Methodology

Module 1 - Digital Contact Tracing (D-CT) and User-Uptake: A Primer

Module 2 - Case Study: Iceland

Module 3 - Case Study: Cyprus

Module 4 - Case Study: Ireland

Module 5 - Case Study: Scotland

Module 6 - Case Study: South Africa

Module 7 - Analysis of User-Uptake Factors: Individual- & Community-Level Influences

Module 8 - Analysis of User-Uptake Factors: System-Level Influences

Module 9 - Recommendations & Future Research

6.2. Module Overview

This module aims to explore Digital Contact Tracing (D-CT) developed and implemented in South Africa for the COVID-19 response. Focus is on their D-CT app, *COVID Alert SA*, and understanding user-uptake. The case study begins with a brief overview of the country's overall response to COVID-19 and the impact of the virus on the country. Following, we explain South Africa's app by describing, how it emerged, how it

is designed and functions, how users engage with the app across the whole user-engagement process, and what user-uptake looks like in the country. The next section describes the main factors that emerged in our research for this country that suggest influencing user-uptake within the country's context. This section ends with a brief conclusion.

6.3. Case Study

6.3.1. COVID-19 in South Africa

On 5 March 2020, South Africa's Minister of Health Zweli Mkhize confirmed the country's first case of COVID-19.⁴ As of 11 February 2021, South Africa has recorded 1,482,412 COVID-19 cases and 47,145 deaths.⁵ South Africa has the most cases and deaths within the continent and is currently ranked 16th in the world as most impacted by COVID-19 (earlier during the pandemic it was ranked fourth).⁶ After cases peaked in July 2020, South Africa managed to flatten its curve, yet from 7 September 2020 to 16 November 2020, the country was seeing anywhere from 1300-2000 cases a day.⁷ This is an achievement given that at its peak the country was seeing 10,000-12,000 cases a day.⁸ The country saw its second wave in late December 2020 and early January 2021 where, at its peak, there were 15,000-20,000 cases/day.⁹ As such, the country is in Adjusted Alert Level 3 of 5 of its COVID-19 Risk Adjusted Strategy.¹⁰

With what has been described as "one of the world's strictest" lockdowns,¹¹ redirecting its TB and HIV-focused health networks to include caring for COVID-19 cases,¹² increasing its testing capacity,¹³ and facilitating door-to-door "case finding,"¹⁴ South Africa is leveraging its experience with these viruses to

⁴ National Institute for Communicable Diseases. (2020, March 5). FIRST CASE OF COVID-19 CORONAVIRUS REPORTED IN SA. NICD. Retrieved from <https://www.nicd.ac.za/first-case-of-covid-19-coronavirus-reported-in-sa/>

⁵ Google News. (2020, November 20). Coronavirus South Africa. Google News. Retrieved from <https://news.google.com/covid19/map?hl=en-CA&mid=%2Fm%2F0hzlz&gl=CA&ceid=CA%3Aen>

⁶ Caromba, L. (2020, August 5). Covid-19 exposure notification apps: We have most of the technology – we just need the trust. Daily Maverick. Retrieved from <https://www.dailymaverick.co.za/article/2020-08-05-covid-19-exposure-notification-apps-we-have-most-of-the-technology-we-just-need-the-trust/>; Mwai, P. (2021, February 8). Coronavirus: Africa's new variants are causing growing concern. BBC. Retrieved from <https://www.bbc.com/news/world-africa-53181555>

⁷ Roser, M., Ritchie, H., Ortiz-Ospina, E., & Hasell, J. (2020). Coronavirus Pandemic (COVID-19). *Our World in Data*. Retrieved from <https://ourworldindata.org/coronavirus/country/south-africa?country=~ZAF>

⁸ Ibid.

⁹ Google News. (2020, November 20). Coronavirus South Africa. Google News. Retrieved from <https://news.google.com/covid19/map?hl=en-CA&mid=%2Fm%2F0hzlz&gl=CA&ceid=CA%3Aen>

¹⁰ COVID-19 South African Online Portal. (2020, April 25). COVID-19 Risk Adjusted Strategy. SA Corona Virus Online Portal. Retrieved from <https://sacoronavirus.co.za/covid-19-risk-adjusted-strategy/>; South African Government. (2021). COVID-19 / Novel Coronavirus. Retrieved from <https://www.gov.za/Coronavirus>

¹¹ Gevisser, M. (2020, May 5). The coronavirus crisis threatens what trust South Africans have left in their government. The Guardian. Retrieved from <https://www.theguardian.com/commentisfree/2020/may/05/coronavirus-crisis-south-africans-lives-livelihoods>

¹² Devermont, J., & Mukulu, T. (2020, May 12). South Africa's Bold Response to the Covid-19 Pandemic. CSIS. Retrieved from <https://www.csis.org/analysis/south-africas-bold-response-covid-19-pandemic>; Nordling, L. (2020, April 7). South Africa hopes its battle with HIV and TB helped prepare it for COVID-19. Science Magazine. Retrieved from <https://www.sciencemag.org/news/2020/04/south-africa-hopes-its-battle-hiv-and-tb-helped-prepare-it-covid-19>

¹³ Caromba, L. (2020, August 5). Covid-19 exposure notification apps: We have most of the technology – we just need the trust. Daily Maverick. Retrieved from <https://www.dailymaverick.co.za/article/2020-08-05-covid-19-exposure-notification-apps-we-have-most-of-the-technology-we-just-need-the-trust/>

¹⁴ Abdool Karim, S. S. (2020). The South African Response to the Pandemic. *New England Journal of Medicine*, 382(24), e95. <https://doi.org/10.1056/nejmc2014960>

inform its response to the pandemic. Alongside these steps, the president, Cyril Ramaphosa, has been an effective communicator and has partnered with political opponents and religious and non-traditional leaders in an effort to enable resident compliance with public health measures.¹⁵ Yet some critics are not as kind towards South Africa's response, highlighting issues and challenges that are hindering the effectiveness or complicating the response, such as: 1) the backlog in receiving test results;¹⁶ 2) that the measures being enacted "will disproportionately affect vulnerable populations, likely perpetuate inequality, and lead to a rise in intergenerational poverty;"¹⁷ 3) that the measures enacted are creating a discontinuity of care for TB and HIV communities;¹⁸ and 4) the "appalling" mismanagement of COVID-19 funds and corruptions.¹⁹

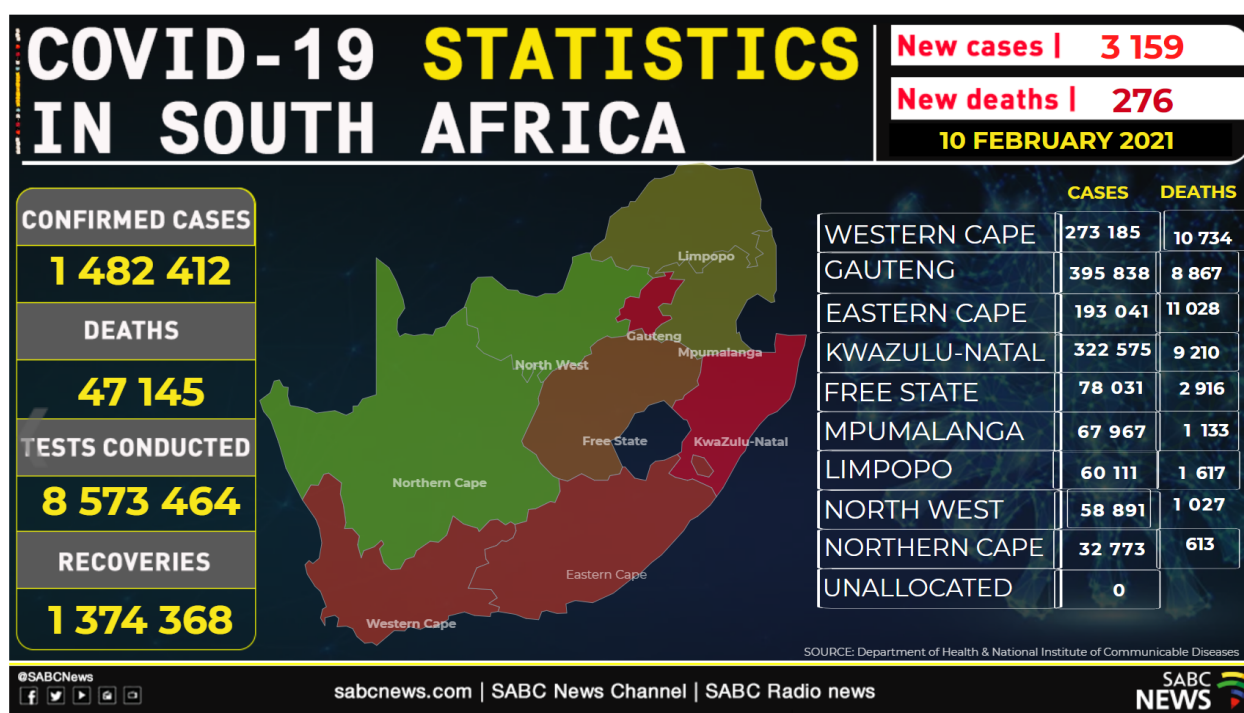


Figure 6.1.0. Map of COVID-19 cases in South Africa as of 10 February 2021²⁰

¹⁵ Devermont, J., & Mukulu, T. (2020, May 12). South Africa's Bold Response to the Covid-19 Pandemic. CSIS. Retrieved from <https://www.csis.org/analysis/south-africas-bold-response-covid-19-pandemic>

¹⁶ Friedman, S. (2020, July 16). South Africa is failing on COVID-19 because its leaders want to emulate the First World. The Conversation. Retrieved from <https://theconversation.com/south-africa-is-failing-on-covid-19-because-its-leaders-want-to-emulate-the-first-world-142732>

¹⁷ Staunton, C., Swanepoel, C., & Labuschagine, M. (2020). Between a rock and a hard place: COVID-19 and South Africa's response. *Journal of Law and the Biosciences*, 7(1). <https://doi.org/10.1093/jlb/lsaa052>

¹⁸ Abdool Karim, S. S. (2020). The South African Response to the Pandemic. *New England Journal of Medicine*, 382(24), e95. <https://doi.org/10.1056/nejmc2014960>

¹⁹ BBC News. (2020, September 2). Coronavirus in South Africa: Misuse of Covid-19 funds "frightening." BBC News. Retrieved from <https://www.bbc.com/news/world-africa-54000930>

²⁰ SABC News. (2021, February 11). Coronavirus: Your Daily Update. Retrieved from <https://www.sabcnews.com/sabcnews/tracking-the-coronavirus/>

6.3.2. Evolution of the Digital Contact Tracing App

One of the more recent attempts to mitigate the spread of COVID-19 is the development and implementation of an exposure notification system called *COVID Alert SA*. Built off the Google Apple Exposure Notification (GAEN) API, the app was developed by Discovery Health at minimal cost for the Department of Health and was released at the beginning of September 2020.²¹ The reason for developing and implementing the app seems to be to support the country's manual contact tracing efforts and contribute "to avoiding a second wave of COVID-19 infections in South Africa, protecting South Africa's healthcare services and vulnerable people, and ending the pandemic."²²

Prior to the release of *COVID Alert SA*, there were two other attempts at using technology to facilitate contact tracing. At the beginning of the pandemic (March 2020), the government developed regulations to curb the spread of COVID-19. One such directive "forced telecommunications providers to give government access to their customers data in a plan to track the movement of South Africans through their mobile phones."²³ This tracking of location-based data caused significant privacy concerns amongst residents and experts alike, with many critics stating this level of surveillance with such minimal privacy and security protections was in violation of the constitution.²⁴ While the government completed a significant rewrite of the directives to outline how it was going to protect privacy and collect, store, and delete data,²⁵ the government seemingly has stopped requesting this data from mobile companies because the data was not accurate enough to conduct contact tracing.²⁶

By the end of April 2020, the focus turned to the development of a digital contact tracing app. There appeared to be a fleeting partnership between University of Cape Town and the government towards the development of COVI-ID.²⁷ Using a combination of QR Codes and geolocation data, the app is an open source, privacy-preserving tool designed for contact tracing.²⁸ This initiative did not evolve into a country-wide, government-driven implementation of the app. Why COVI-ID was abandoned in favour of a new

²¹ COVID-19 South African Online Portal. (2020, September 2). How the new Covid Alert SA smartphone app works. Retrieved from <https://sacoronavirus.co.za/2020/09/02/how-the-new-covid-alert-sa-smartphone-app-works/>

²² Discovery. (n.d.). Turn your smartphone into a life-saving device. Discovery. Retrieved from <https://www.discovery.co.za/corporate/download-covid-alert-sa-app-today>

²³ Young, N. (2020, April 7). South Africans are worried the government will use coronavirus phone tracking to spy on them. Quartz Africa. Retrieved from <https://qz.com/africa/1834409/coronavirus-south-africans-are-worried-about-cellphone-privacy/>

²⁴ Singh, A., & Power, M. (2020, March 31). New digital regulations mean the state can track you — no questions asked. The Mail & Guardian. Retrieved from <https://mg.co.za/article/2020-03-31-new-digital-regulations-mean-the-state-can-track-you-no-questions-asked/>

²⁵ Hunter, M., & Thakur, C. (2020, April 3). Advocacy: New privacy rules for Covid-19 tracking a step in the right direction, but amaBhungane. Retrieved from <https://amabhungane.org/advocacy/advocacy-new-privacy-rules-for-covid-19-tracking-a-step-in-the-right-direction-but/>

²⁶ COVID-19 South African Online Portal. (2020, September 17). EXPLAINER: Should I download the new contact tracing app? Retrieved from <https://sacoronavirus.co.za/2020/09/17/explainer-should-i-download-the-new-contact-tracing-app/>

²⁷ Monzon, L. (2020, April 30). SA Government, UCT Partner on COVID-19 Tracing App. IT News Africa. Retrieved from <https://www.itnewsafrika.com/2020/04/sa-government-uct-partner-on-covid-19-tracing-app/>

²⁸ Yahoo Finance. (2020, September 10). PathCheck Foundation Adds Covi-ID Technology and Team to Increase Access to Exposure Notification to Vulnerable Communities Worldwide. Yahoo Finance. Retrieved from <https://ca.finance.yahoo.com/news/pathcheck-foundation-adds-covi-id-142100438.html>

initiative to develop what is now *COVID Alert SA* is uncertain, but COVI-ID is now a part of MIT's PathCheck Foundation.²⁹

COVID Alert SA is a component of the National Department of Health's larger digital response to COVID-19, which is the COVIDConnect platform.³⁰ This platform provides news and information about COVID-19, a risk assessment tool, and COVID-19 test results via either WhatsApp or SMS.³¹ If someone using COVIDConnect tests positive for COVID-19, they are prompted for further information regarding close contacts and those people are alerted of their potential exposure to COVID via SMS.³² The COVIDConnect Platform is designed to increase the reach of technology as it is available for those who have smartphones that may not be new enough to download the contact tracing app or do not have a smartphone.³³

6.3.3. How the app works/design

Table 6.1.0: COVID Alert SA Details

	South Africa
Name of the App	Covid Alert SA
Developer(s)	<ul style="list-style-type: none"> ❖ Developer: Discovery Health SA ❖ Publisher: South African National Department of Health
Decentralized or Centralized Data Collection	Decentralized
Bluetooth, GPS, Both, Other	Bluetooth
Type of App: GAEN or Other	Google Apple Exposure Notification API
Mobile Requirements: e.g. iOS, Android, version	iOS 13.5 or later Android 6.0 or later
Alternate functionality?	N/A
Data Collected (Voluntarily) By App	<ul style="list-style-type: none"> ❖ Exposure Notification Keys ❖ Time, Date, and Length of these Events
Data Collected (Voluntarily) By Government	<ul style="list-style-type: none"> ❖ Exposure Notification Keys³⁴ ❖ Time, Date and Length of these Events
Data Collection permission	Voluntary

²⁹ Ibid.

³⁰ Covid Alert SA App. (2020, September 1). Download the app – Every COVID Alert SA app download means more lives saved in SA. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/2020/09/01/download-the-app-every-covid-alert-sa-app-download-means-more-lives-saved-in-sa/>

³¹ Ibid.

³² Ibid.

³³ Ibid.

³⁴ Apple, & Google. (2020). Exposure Notification Frequently Asked Questions Preliminary -Subject to Modification and Extension. Retrieved from <https://covid19-static.cdn-apple.com/applications/covid19/current/static/contact-tracing/pdf/ExposureNotification-FAQv1.1.pdf>

Data Deletion period14 days³⁵

COVID Alert SA is a decentralized, Bluetooth-based exposure notification system built off the GAEN API. It was developed by Discovery Health for the South African National Department of Health who is the official publisher of the app. It is only available in English and users must have smartphones with either iOS 13.5 or later or Android 6.0 or later. The only data collected by the app is the exposure notification keys alongside the time, data, and length of these exposure events.³⁶ Users can choose to voluntarily upload the same data to the government if the user tests positive for COVID-19. Downloading, using, and uploading the data is completely voluntary. Data is deleted off the app after 14 days.³⁷

6.3.3.1. The App Engagement Process

Phase One: Downloading and Setup

COVID Alert SA is available for download on Google Play or the Apple store. Once the user downloads and opens the app, the first screen highlights what the app does and how privacy is protected. Once the user clicks 'get started,' a pop-up screen will ask for permission to turn on exposure notifications at which point the user can click 'cancel' or 'turn on.' A final screen then reiterates that it is important to share a positive diagnosis to break the chain of transmission in the community at which point the user clicks 'done.'

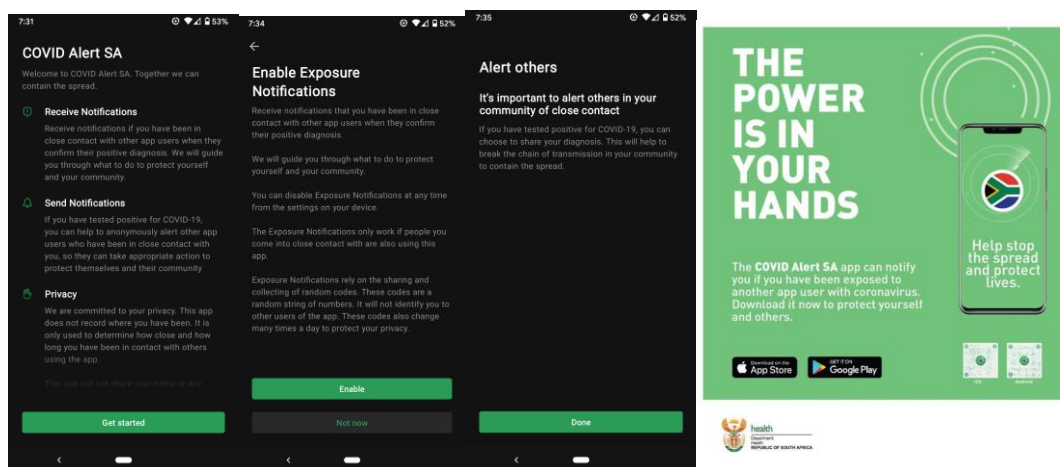


Figure 6.2.0. Initial Set-Up Screen Images of COVID Alert SA

³⁵ COVID-19 South African Online Portal. (n.d.). Privacy Policy. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/covidalert/privacy-policy>

³⁶ Apple, & Google. (2020). Exposure Notification Frequently Asked Questions Preliminary - Subject to Modification and Extension. Retrieved from <https://covid19-static.cdn-apple.com/applications/covid19/current/static/contact-tracing/pdf/ExposureNotification-FAQv1.1.pdf>

³⁷ COVID-19 South African Online Portal. (n.d.). Privacy Policy. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/covidalert/privacy-policy>

Phase Two: Usage

The app simply runs in the background but Bluetooth must always be on³⁸ and the user must allow the app to run/refresh in the background.³⁹ The government also recommends that the user has their mobile network on or is connected to a WI-FI network while using the app. In saying that, the app will work without a mobile network or WI-FI, but exposure notifications will only be received once the user reconnects to a mobile or WI-FI network. If the user was to open the app, and no exposures were detected, the screen would say 'no notifications found' and have a green radar screen, as in Figure 3.⁴⁰

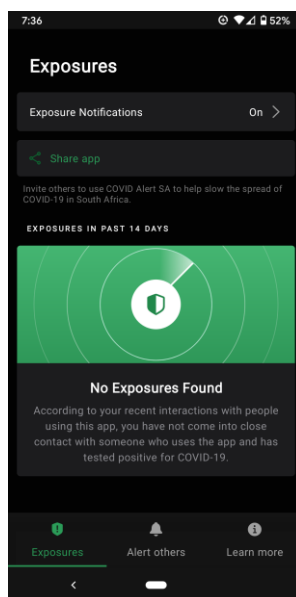


Figure 6.3.0. 'No Exposure Found' Screen on COVID Alert SA

Phase Three: Reporting

If the user receives a positive COVID-19 diagnosis, the user can choose to alert others by going to the 'Alert Others' tab on the app. The user can then select 'Alert others of close contact' at which point the user will be asked to enter the unique code the National Department of Health sent along with the COVID-19 test result as well as the user's date of birth. The user will then be asked to share the random codes the app has collected from the past 14 days to "initiate the process of notifying other app users' of a potential exposure."⁴¹ The user will then be directed to a 'diagnosis shared' screen and then be asked to "assist the National Department of Health by going to the COVID Alert SA WhatsApp tool to help to identify people [the user has] been in contact with other the past few days. At this point, the user will receive instructions and guidance as to next steps.

³⁸ For Android users, the app may request for location data but will not use it. Google is currently working on a fix to decouple Bluetooth with location data.

³⁹ COVID-19 South African Online Portal. (n.d.). COVID Alert SA app Frequently Asked Questions. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/covidalert/covidalert-faq/>

⁴⁰ COVID-19 South African Online Portal. (n.d.). COVID Alert SA app Frequently Asked Questions. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/covidalert/covidalert-faq/>

⁴¹ Ibid.

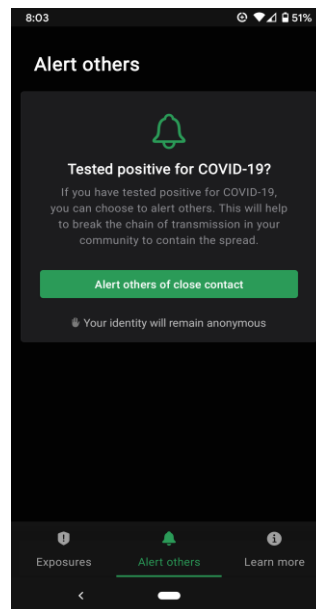


Figure 6.4.0. Reporting a Positive COVID-19 Diagnosis on COVID Alert SA

Part Four: Reacting

If a user has been potentially exposed to COVID-19, the user will receive a notification. When the user opens the app, the previous green radar screen will be orange and the message will say “possible exposure.” Clicking on the radar screen will show the user the date of contact. The app will then provide next steps to take, such as self-quarantining for 10 days, monitoring symptoms, and accessing the National COVID-19 hotline.



Figure 6.5.0 Exposure Alerts on COVID Alert SA

6.3.4. App-Uptake

6.3.4.1. Uptake Summary

Table 6.2.0: COVID Alert SA Uptake Summary

	South Africa
Uptake (#downloads)	~600,000 ⁴²
Uptake (active users)	Data could not be found
General Uptake (# of downloads general population)	~1%
Age Appropriate Uptake (# of downloads / people over age allowed to download)	~1.5%
Digital Uptake (# of downloads / connected population)	~1.96%
Digital Capability Uptake (# of downloads / app-compatible population)	~1%

6.3.4.2. Uptake Description

With a population of 57,780,000 and 600,000 downloads, approximately 1% of the population has downloaded *COVID Alert SA*.⁴³ The government states that children must be 13 or older to use the app.⁴⁴ Using 2019 data that indicates 29% of the population was 0-14, roughly 41,030,000 people are eligible to download the app which would increase the uptake to 1.5%.⁴⁵ To calculate digital uptake, it was most appropriate to see how many individuals access the internet via mobile phones which is 52.8% or 30,507,840.⁴⁶ This means that digital uptake is about 1.96%. In terms of digital capability uptake, it was not possible to find data that highlighted how many Android users or iOS users were using 6.0 and later 13.5 and later respectively. It was only possible to determine that 99.4% of all smartphone users use either Android or iOS which would create a population of 52,379,187.84 and a very rough digital capability uptake percentage of just over 1%.⁴⁷ It is important to note that, as mentioned in Module 1, Section 1.5, there are significant issues with determining app success via uptake percentages.

⁴² As of 13 October 2020

⁴³ Nortier, C. (2020, October 13). *COVID Alert SA app: The fine balance between public health, privacy and the power of the people*. Maverick Citizen. Retrieved from <https://www.dailymaverick.co.za/article/2020-10-13-covid-alert-sa-app-the-fine-balance-between-public-health-privacy-and-the-power-of-the-people/>

⁴⁴ COVID-19 South African Online Portal. (n.d.). *COVID Alert SA app Frequently Asked Questions*. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/covidalert/covidalert-faq/>

⁴⁵ The World Bank. (n.d.). *Population ages 0-14 (% of total population) - South Africa*. World Bank Group. Retrieved from <https://data.worldbank.org/indicator/SP.POP.0014.TO.ZS?locations=ZA>

⁴⁶ Statista. (2021). *South Africa mobile internet user penetration 2015-2025*. Statista Research Department. Retrieved from <https://www.statista.com/statistics/972866/south-africa-mobile-internet-penetration/#:~:text=In%202020%2C%2052.8%20percent%20of,amounted%20to%20over%2031.29%20million>

⁴⁷ StatCounter GlobalStats. (n.d.). *Mobile Operating System Market Share South Africa*. StatCounter. Retrieved from <https://gs.statcounter.com/os-market-share/mobile/south-africa>

6.4. Uptake Factors

6.4.1. Summary of Uptake Factors

Table 6.3.0: Summary of Uptake Factors in South Africa

Factor	Micro, Meso, and/or Macro	Brief Description
Communications & Misinformation	Meso-Macro	A comprehensive communications campaign has been a core component of South Africa's response to COVID-19, yet lack of trust in the government, misinformation swarming the app, and leveraging values that may not resonate with South Africans are factors that may discourage residents from downloading the app.
Accessibility & Inclusion	Macro	The government has taken steps, such as zero-rating the app (i.e. not charging individuals for the data used to download the app), to make the app more inclusive which may improve app-uptake. Yet only providing the app in English and not taking further steps to include other marginalized or vulnerable communities may also create barriers to downloading and using the app.
Trust in Public/Private Institutions	Macro	There already exists a significant lack of trust towards the government which is further exacerbated by the fraud, corruption, and abuse surrounding initiatives relating to South Africa's COVID-19 response, thereby creating a disincentive to downloading a government-implemented app.
Response Infrastructure	Macro	While South Africa's experience with health epidemics has facilitated a more effective response to COVID-19 - in terms of increased testing, 'case finding' strategies, early implementation of lockdown, and other aspects highlighted in 4.2.4 - the country's healthcare infrastructure lacks capacity and is fraught with systemic inequality relating to access and quality of care which ultimately impacts healthcare processes that are intertwined with the app's processes.

6.4.2. Factor Descriptions

6.4.2.1. Communications & Misinformation

A significant part of South Africa's response to the pandemic was a "comprehensive communication campaign" through traditional media alongside social media and messaging apps to inform people about measures taken to mitigate the spread of the virus.⁴⁸ This tactic was similarly used for the launch of *COVID Alert SA*, with safety and privacy at the forefront of the communications content.⁴⁹ Alongside messages encouraging the understanding of the app's safety and privacy features, the campaigning around downloading and using the app uses phrasing that focuses on saving the day and protecting the community. The government has called people who download the app to be the "new superheroes."⁵⁰ Furthermore, they call upon residents to "become a part of a powerful digital network of app users who

⁴⁸ South African Government News Agency. (2020, September 3). The importance of leading communication during epidemics. Retrieved from <https://www.sanews.gov.za/south-africa/importance-leading-communication-during-epidemics>

⁴⁹ Nortier, C. (2020, October 13). MAVERICK CITIZEN: COVID Alert SA app: The fine balance between public health, privacy and the power of the people. Daily Maverick. Retrieved from <https://www.dailymaverick.co.za/article/2020-10-13-covid-alert-sa-app-the-fine-balance-between-public-health-privacy-and-the-power-of-the-people>

⁵⁰ COVID-19 South African Online Portal. (2020, September 1). Why are COVID Alert SA app users South Africa's new superheroes? Retrieved from <https://sacoronavirus.co.za/2020/09/01/why-are-covid-alert-sa-app-users-south-africas-new-superheroes/>

choose to work together for the benefit of everyone in the app community.”⁵¹ Yet interestingly, as will be further discussed in Section 6.4.2.3., trust in government is low – which could suggest that regardless of clear, consistent messaging, people may still not trust what the government is saying about the app. Furthermore, it is particularly interesting that the government is trying to leverage community relationships to encourage people to download the app. Data from the South African Reconciliation Barometer (SARB) revealed that South Africans: “only have a high degree of trust in their immediate circles of contact – relatives and neighbours – and low levels of trust in people of differing cultural backgrounds – language, religion, sexuality. Worryingly, a small majority of respondents do not trust foreigners, especially from African countries.”⁵² This data highlights that South Africans may not be motivated to download the app to be a superhero for the larger app-using community.

To further promote accurate communications, the government has implemented regulations to limit the spread and proliferation of fake news. Specific types of businesses are now mandated to remove fake news.⁵³ Furthermore, those who purposefully create or spread fake information can be prosecuted.⁵⁴ Despite these actions, the *COVID Alert SA* app has been surrounded by misinformation. The *Daily Maverick* used the *Real411* platform to analyze disinformation trends surrounding COVID-19. As of 20 September 2020, there were 711 complaints regarding misinformation.⁵⁵ A social media post from a popular South African musician – David Scott of The Kiffness – was the source of 20 of these complaints because the musician ‘satirically’ suggested that the app collects credit card information.⁵⁶ While this claim is wildly inaccurate and the musician retrospectively claimed it was satire, within the pandemic context, anything that shares confusing, inaccurate information can “very well contribute to further distrust, confusion, skepticism, and encourage the public to do the complete opposite to the call from the president by not downloading the app.”⁵⁷ Ultimately, while the government is trying its best to promote uptake of the app through effective communication, various factors from systemic mistrust of the government to misinformation surrounding the app may negate these actions, creating disincentives to download the app.

6.4.2.2. Accessibility and Inclusion

Generally speaking, South Africa’s digital response to COVID-19 has attempted to be inclusive in some ways. For instance, COVIDConnect, described in Section 6.3.2, was implemented for the purpose of creating opportunities for people to access information and healthcare resources despite not having a

⁵¹ COVID-19 South African Online Portal. (n.d.). COVID Alert SA App. Retrieved from <https://sacoronavirus.co.za/covidalert/>

⁵² Mosa, M. (n.d.). South Africa’s Trust Deficit and Covid-19. The Institute for Justice and Reconciliation. Retrieved from <https://www.ijr.org.za/2020/06/30/south-africas-trust-deficit-and-covid-19/>

⁵³ COVID-19 South African Online Portal. (2020, March 30). COVID-19 Fake News Reporting. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/2020/03/30/covid-19-fake-news-reporting/>

⁵⁴ South African Government. (n.d.). Fake news - Coronavirus COVID-19 | South African Government. Republic of South Africa. Retrieved from <https://www.gov.za/covid-19/resources/fake-news-coronavirus-covid-19>

⁵⁵ Smith, T., & Bird, W. (2020, September 20). OP-ED: Disinformation in a time of Covid-19: Weekly trends in South Africa. *Daily Maverick*. Retrieved from <https://www.dailymaverick.co.za/article/2020-09-20-disinformation-in-a-time-of-covid-19-weekly-trends-in-south-africa-10/>

⁵⁶ Ibid.

⁵⁷ Ibid.

smartphone that was compatible with *COVID Alert SA*.⁵⁸ While *COVID Alert SA* still remains inaccessible for some, the government has taken steps to increase its accessibility, including: 1) having mobile network providers zero-rate the app (which means that individuals are not charged for the data used to download the app); and 2) making the app only 3MB so that more people could download it.⁵⁹

These actions certainly reduce the barriers to downloading the app, yet it is important to note that there will be certain communities who struggle to access the app, including the elderly, the homeless, and potentially visually impaired individuals. Furthermore, the app is only offered in English and only roughly 8.4% of households speak English,⁶⁰ thereby potentially creating a significant barrier to app-uptake. Finally, what will become very clear in Section 6.4.2.4. is that the racial inequalities that are a deeply rooted issue in South Africa may not necessarily create an issue of accessibility in terms of downloading the app, but certainly create issues in accessing healthcare. Healthcare services are needed for individuals to get tested (and upload on the app a positive COVID-19 diagnosis if required) as well as to receive healthcare for particularly serious cases of COVID-19.

6.4.2.3. Trust in Public/Private Institutions

The trust residents have in their government can certainly determine the extent to which COVID-19 public health policies are followed.⁶¹ Yet, only 33% of South Africans claim they trust their legislature 'a lot' or 'somewhat'.⁶² This lack of trust is reflective of South Africa's history as an abusive state during the apartheid era; the continued "disaffection" with the political parties in power, such as the ANC (largely due to the corruption of these parties);⁶³ and the "deep-seated inequality" that continues to exist.⁶⁴ This lack of trust continues to exist during the pandemic. In fact, even during the COVID-19 pandemic, "there was fraud and corruption in how the government dealt with the allocation of funds."⁶⁵ For instance, there are reports that personal protective equipment was bought for "five times more than the price the national treasury had advised."⁶⁶ While the president, Cyril Ramaphosa, has already started to take action surrounding the politicians accused of corruption (including being told to resign), residents are wanting to see these politicians face trial and be convicted for corruption.⁶⁷ Additionally, security forces – deployed to enforce regulations when the lockdown was imposed early during the pandemic – have allegedly been

⁵⁸ Covid Alert SA App. (2020, September 1). Download the app – Every COVID Alert SA app download means more lives saved in SA. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/2020/09/01/download-the-app-every-covid-alert-sa-app-download-means-more-lives-saved-in-sa/>

⁵⁹ COVID Alert SA App. (2020, September 1). Why are COVID Alert SA app users South Africa's new superheroes?. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/2020/09/01/why-are-covid-alert-sa-app-users-south-africas-new-superheroes/>

⁶⁰ Editor. (2018, June 28). WORLDVIEW: Few South Africans speak English, so why is it the language of business and politics. BizNews. Retrieved from [https://www.biznews.com/premium/2018/06/28/english-language-business-politics#:~:text=According%20to%20Statistics%20South%20Africa,%2C%20and%20Setswana%20\(8.9%25\)](https://www.biznews.com/premium/2018/06/28/english-language-business-politics#:~:text=According%20to%20Statistics%20South%20Africa,%2C%20and%20Setswana%20(8.9%25))

⁶¹ Devermont, J., & Mukulu, T. (2020, May 12). South Africa's Bold Response to the Covid-19 Pandemic. CSIS. Retrieved from <https://www.csis.org/analysis/south-africas-bold-response-covid-19-pandemic>

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Devermont, J., & Mukulu, T. (2020, May 12). South Africa's Bold Response to the Covid-19 Pandemic. CSIS. Retrieved from <https://www.csis.org/analysis/south-africas-bold-response-covid-19-pandemic>

⁶⁵ BBC News. (2020, September 2). Coronavirus in South Africa: Misuse of Covid-19 funds "frightening." BBC News. Retrieved from <https://www.bbc.com/news/world-africa-54000930>

⁶⁶ Ibid.

⁶⁷ Ibid.

excessively and/or unnecessarily abusive towards residents.⁶⁸ Instances of fraud, corruption, and abuse hardly promote trust in the public eye and can certainly impact how residents look at public health measures.

In fact, some South Africans suggest that the *COVID Alert SA* app “is just another case of the government trying to track and control us, farm our data, and other similar concerns.”⁶⁹ While many experts have dismissed many of privacy and security claims – citing that the app does not track location, cannot identify individuals, and is far less invasive than day-to-day social media apps – the mistrust residents have towards the government will establish, or reinforce existing, perceptions regarding the government’s actions.⁷⁰ Furthermore, these perceptions may not be focused on whether information is being stolen, but as to who is in charge of tracing, as a recent UK study found.⁷¹ Since the *COVID Alert SA* app is owned and managed by the government, rather than a health organization – the preferred option⁷² – it may truly be the trust in the government, rather than perceptions surrounding privacy, that are acting as a barrier to uptake.

6.4.2.4. Response Infrastructure

Having extensive experience combating TB and HIV epidemics as well as having a health infrastructure to support these crises has proven to be of benefit for South Africa’s response to COVID-19. South Africa is not only leading the continent in testing per capita (and is ranked 19th globally),⁷³ but went into a strict lockdown early, implemented door-to-door case findings,⁷⁴ “proactively set up a National COVID-19 Modelling Consortium” for COVID-19-related projections,⁷⁵ and redirected its TB and HIV health care infrastructure to manage COVID-19 cases. Amongst other initiatives taken to mitigate the spread of COVID-19, it appears South Africa had the experience and infrastructure to make decisions and implement specific measures.

Despite their long history with battling epidemics and having built a ‘strong’ healthcare and emergency management infrastructure that is tailored to these epidemics, South Africa’s infrastructure simply cannot effectively manage COVID-19. This is in part due to the continued care needed by HIV, TB, diabetes, and

⁶⁸ Human Rights Watch. (2020, April 7). South Africa: Set Rights-Centered COVID-19 Measures. Human Rights Watch. Retrieved from <https://www.hrw.org/news/2020/04/07/south-africa-set-rights-centered-covid-19-measures>

⁶⁹ Stone, J. (2020, September 21). What Security Experts Say About Downloading The ‘COVID Alert SA’ App. 2OceansVibe News. Retrieved from <https://www.2oceansvibe.com/2020/09/21/what-security-experts-say-about-downloading-the-covid-alert-sa-app/#ixzz6eCF0uVtu>

⁷⁰ Ibid.

⁷¹ Botes, M. (2020, November 10). Unpacking the legal and ethical aspects of South Africa’s COVID-19 track and trace app. The Conversation. Retrieved from <https://theconversation.com/unpacking-the-legal-and-ethical-aspects-of-south-africas-covid-19-track-and-trace-app-147137>

⁷² Ibid.

⁷³ Travalay, Y., & Mare, A. (2020, July 8). Learning from the best: Evaluating Africa’s COVID-19 responses. Brookings. Retrieved from <https://www.brookings.edu/blog/africa-in-focus/2020/07/08/learning-from-the-best-evaluating-africas-covid-19-responses/>

⁷⁴ Investec. (2020, June 8). Is SA’s healthcare system prepared for Covid-19? Investec. Retrieved from https://www.investec.com/en_za/focus/beyond-wealth/is-south-africas-healthcare-system-prepared-for-covid-19.html

⁷⁵ Travalay, Y., & Mare, A. (2020, July 8). Learning from the best: Evaluating Africa’s COVID-19 responses. Brookings. Retrieved from <https://www.brookings.edu/blog/africa-in-focus/2020/07/08/learning-from-the-best-evaluating-africas-covid-19-responses/>

high blood pressure patients that continues to tax the healthcare system.⁷⁶ Furthermore, the country has a severe shortage of 'skilled' healthcare workers.⁷⁷ Finally, while South Africa is the highest testing country in the continent, it is also facing a backlog of unprocessed COVID-19 tests (due to factors such as relying on imports).⁷⁸ Ultimately, lack of capacity (from both medical supplies and personnel standpoints), the healthcare system is extremely overburdened and lacks efficacy. This context creates the question as to whether residents who download and use the app would be able to upload a positive case or receive care (if told by the app to do so) if test results are delayed or healthcare facilities do not have the capacity to care for COVID-19 cases, thereby questioning the usefulness of downloading the app.

On top of these issues, lies the systemic inequality impacting whether a person can receive healthcare, what type of healthcare the person receives, and even if people have the luxury of following public health measures. With half of the nation living in poverty, and many lacking access to electricity and water, public health measures – like washing hands, let alone downloading a contact tracing app – may not be accessible to many.⁷⁹ Furthermore, while 90% of South Africans live within two hours of a health facility, Black Africans tend to live farther away and do not necessarily have the resources to travel to healthcare centres.⁸⁰ Finally, 66% of South Africa's ventilators are in private hospitals, creating not only an accessibility divide to those who cannot afford private healthcare, but unequal care that is based on what a person can afford.⁸¹ This means that if someone were to be notified of a possible exposure, they may not be able to take the next step to get tested and upload a positive diagnosis on the app (if necessary). Another consideration is that the app may recommend that the user "seek[s] medical care if symptoms start or get worse."⁸² This raises questions not only about whether the user is able to access healthcare, but whether they receive equal and standardized care.

Ultimately, this context highlights that vulnerable communities, such as those of low socioeconomic status, in rural areas, and Black communities, are very likely disproportionately impacted by COVID-19 and also are not necessarily equally benefited by the actions taken by the government nor the infrastructures that are in place. Given that getting tested and being provided with care are necessary during the pandemic and are intertwined with the *COVID Alert SA* app's process, the lack of equal accessibility to, and benefits of, public health measures and healthcare, may prove to be a disincentive to downloading the using the app.

⁷⁶ Investec. (2020, June 8). Is SA's healthcare system prepared for Covid-19? Investec. Retrieved from https://www.investec.com/en_za/focus/beyond-wealth/is-south-africas-healthcare-system-prepared-for-covid-19.html; Due to the high prevalence of these disease, the healthcare system in South Africa is already particularly burdened

⁷⁷ Ibid.

⁷⁸ Anna, C. (2020, May 29). South Africa has virus testing backlog of nearly 100,000. CTV News. Retrieved from <https://www.ctvnews.ca/health/coronavirus/south-africa-has-virus-testing-backlog-of-nearly-100-000-1.4960080>

⁷⁹ Devermont, J., & Mukulu, T. (2020, May 12). South Africa's Bold Response to the Covid-19 Pandemic. CSIS. Retrieved from <https://www.csis.org/analysis/south-africas-bold-response-covid-19-pandemic>

⁸⁰ Ibid.

⁸¹ Ibid.

⁸² COVID-19 South African Online Portal. (n.d.). COVID Alert SA app Frequently Asked Questions. COVID-19 South African Online Portal. Retrieved from <https://sacoronavirus.co.za/covidalert/covidalert-faq/>

6.5. Conclusion

COVID Alert SA is a decentralized, Bluetooth-based exposure notification system built off of the GAEN API. With 600,000 downloads, approximately 1% of the country has downloaded the app. South Africa's response to COVID-19 generally has been quite strong, with many positive aspects. The development and implementation of *COVID Alert SA* also has positive features. Communications have been consistent and informative, steps have been taken to make the app more inclusive, and South Africa's history of managing complex crises has assisted with its response to COVID-19, allowing it to be more effective than it would have been without this experience with epidemics. These factors may have helped promote residents to download and use the app. Yet the significant lack of trust in the government, misinformation surrounding the app, deep-seated inequality, and a general lack of capacity within the healthcare system creates barriers or disincentives to downloading *COVID Alert App* which may explain the country's low uptake.