A Review of Covid-19 Symptom Checker Mobile Applications

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Introduction

- Digital technologies have been widely utilized to assist with disease detection and management throughout the Covid-19 pandemic.
- A Covid-19 symptom checker smartphone app can enable a user to carry out a health assessment and receive clinically validated advice related to self-isolation, testing and whether to seek clinical care.
- However, technology adoption can be impacted by multiple factors including perceived usefulness of the app, and concerns related to privacy and trust.
- This study reviewed nine symptom checker smartphone apps, available for UK and EU countries.
- We investigated the functionality, technical features and privacy aspects of each app towards gaining insight to possible barriers to adoption.

Methods

- This study reviewed nine Covid-19 symptom assessment apps that had been provided by government agencies within the UK or EU.
- All the apps were available for both the Android and iOS platforms.
- Each app was critiqued with relation to the type of data collected and the symptom assessment process.
- We also completed an evaluation of any privacy and support materials. This included content that appeared within the app, or on an official website, GitHub repository, or online app store.

Results

Table 1. Technical Profile of Apps

App Name	Primary Usage Location	Play Store Installs	Compatibility Android	Compatibility iOS
Asistencia COVID-19 [1]	Spain	100,000+	6.0 and up	11.0 or later
COVIDCare NI [2]	Northern Ireland	100,000+	4.2 and up	9.0 or later
COVID Tracker Ireland [3]	Ireland	500,000+	6.0 and up	11.0 or later
Karantinas [4]	Vilnius, Lithuania	10,000+	5.0 and up	9.0 or later
NHS COVID-19 [5]	England & Wales	5,000,000+	6.0 and up	13.5 or later
NHS 24 : Covid-19 and flu-information [6]	Scotland	10,000+	4.2 and up	12.0 or later
Stopp Corona [7]	Austria	100,000+	6.0 and up	13.5 or later
STOP COVID19 CAT [8]	Catalunya, Spain	500,000+	5.0 and up	11.0 or later
STOP COVID – ProteGO Safe [9]	Poland	1,000,000+	5.0 and up	12.1 or later

Table 2. Symptom Checking Characteristics of Apps

App Name	No. of Available Languages	No. of Personal Data	No. of Health Questions	Symptom Checking Functionality
Asistencia COVID-19	4	-[a]	-[a]	-[a]
COVIDCare NI	1	4	> 4	Internet Required
COVID Tracker Ireland	8	4	4	Works Offline
Karantinas	2	-[a]	-[a]	-[a]
NHS COVID-19	12	1	4	Internet Required
NHS 24 : Covid-19 and flu-information	1	0	4	Internet Required
Stopp Corona	2	0	3	Works Offline
STOP COVID19 CAT	5	-[a]	-[a]	-[a]
STOP COVID – ProteGO Safe	4	2	> 4	Works Offline

[a] Due to access issues, we were unable to scrutinize these items for this app.

Table 3. Privacy and Transparency Features of Apps

App Name	Model of Consent	Privacy Information	Terms of Use	Source Code Available
Asistencia COVID-19	Opt-in[a]	Online	Online	No
COVIDCare NI	Opt-in	In-app[b], Online	In-app[b], Online	No
COVID Tracker Ireland	Opt-in	In-app[c], Online	In-app[c], Online	Yes
Karantinas	-[d]	Online	-[d]	No
NHS COVID-19	Opt-in	In-app[b], Online	In-app[b], Online	Yes
NHS 24 : Covid-19 and flu-information	None	Online	In-app[b]	No
Stopp Corona	Opt-in	In-app[c], Online	In-app[c]	Yes
STOP COVID19 CAT	Opt-in	In-app[b], Online	In-app[b]	No
STOP COVID – ProteGO Safe	Opt-in	In-app[c], Online	In-app[c], Online	Yes

[a] We were unable to determine whether the consent process was functional.
[b] In-app content requires Internet connection.
[c] In-app content does not require Internet connection.
[d] We were unable to determine whether this content was present in the app.

- During the study we fully evaluated six of the apps.
- Most of the apps were multifunctional and in additional to symptom logging and assessment also provided Covid-19 public health information [2, 3, 5, 6], self-isolation timers [2, 5] and contact tracing capabilities [3, 5, 7, 9].
- Seven of the apps were available with more than one language.
- The most frequently required data item was age or age range [2, 3, 9].
- The most common symptoms checked were fever, onset of cough, loss of taste or smell and breathing difficulties.
- Privacy information was available for all the apps. This could include a privacy policy and a Data Protection Impact Assessment (DPIA). For some apps the privacy information was bilingual.
- A GitHub repository had been provided for four of the apps [3, 5, 7, 9]. These provided source code and various technical documentation.

Discussion

- Market share statistics indicate that the nine Android apps would be compatible with over 80% of Android devices [10]. As 80% of iPhone devices use iOS14 [11] the iOS apps would be accessible to many iPhone users.
- Most apps requested personal and health data. Some users may be uncomfortable entering information that, if combined with other information, could be personally identifiable.
- Only three of the apps could provide advice when offline. This may limit the usefulness of the app for those without access to a reliable or secure Internet connection.
- For most of the apps comprehensive information was provided that would assist users with making an informed decision about using the app.
- For some apps privacy information was available in an easy read format thereby enhancing readability and accessibility to all citizens.

Conclusion

Our investigation suggests that symptom checking mobile apps are becoming widely available for use and therefore offer useful support for managing public health concerns, and healthcare delivery throughout the Covid-19 pandemic.

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