Research

Is it a civic duty? An exploratory study of factors that may have affected people's decision to download the NHS COVID-19 app

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Abstract

Background/Aims The UK Government piloted a COVID-19 digital contact tracing smartphone app on the Isle of Wight, England, in June 2020 in an attempt to contain the spread of the virus. This study aimed to investigate the factors that affected the decision to download the app among individuals in the Isle of Wight.

Methods Online questionnaires were distributed over social media to the sample population. Quantitative data were analysed, both descriptively and using a Chi-square or Fisher's test. Qualitative data were analysed through content analysis.

Results Overall, 74.2% of participants downloaded the COVID-19 app, citing compliance, protection and fighting the pandemic or returning to normal as their main reasons. There was a significant negative correlation between having concerns about the app and downloading the app ($P=<0.01$). Concerns were split into the three themes of privacy/data security concerns, technology issues, and increased complacency. There was a significant negative correlation between being in a COVID-19 high-risk group and downloading the app ($P=0.042$).

Conclusions Concerns about the COVID-19 app, particularly in terms of its security, significantly affected whether participants were likely to download it. The results provide insight into factors influencing mass public health behaviours and can form the basis for future research into app-based interventions.

Key words

COVID-19; NHS app; Pandemic; Test and trace

Background

In June 2020, the UK Government (2020a) trialed a version of the NHS COVID-19 app on the Isle of Wight, England. The app used Bluetooth technology to detect people who had been in close proximity with someone who had later developed COVID-19 symptoms or has a positive test result, and alerted them to self-isolate (UK Government, 2020a).

Low rates of uptake of the digital tracing app, resulting in a small user base, would limit the effectiveness of the system (Dar et al, 2020). It is estimated that around 75% of the population would have needed to download the NHS COVID-19 app to make it effective (Ada Lovelace Institute, 2020). However, privacy and security concerns have been raised about the use of tracking apps (Cho et al, 2020). Issues such as governance, data protection and state intrusion can damage public trust and prevent use of the app, potentially leading to a general backlash against any government COVID-19 measures (Ada Lovelace Institute, 2020). Therefore, users' perceptions and experiences of using the app were crucial to the success of digital contact tracing.

A UK study suggested that around 75% of people were likely to install the app, and that introduction of an app would improve their opinion of the government (Abeler et al, 2020). Barriers to installing the app were expected to be focused around security, state intrusion and anxiety about the pandemic (Abeler et al, 2020). The Isle of Wight, situated off the south coast of England, had a population of around 140,984 in 2020 (Isle of Wight Council, 2020). At the time of the app's trial in June 2020, the island had 202 confirmed COVID-19 cases (UK Government, 2020b) and 39 deaths (NHS England, 2020).

After a 4-week trial, the app was abandoned, eventually being replaced by a different app that was rolled out nationally. However, greater understanding of the public's behaviour during this trial could provide important information about leadership in crises, particularly pandemics, and the use of emergent technology. Therefore, this study explored the factors that may have affected people's decision about whether to download the NHS COVID-19 app during the trial period, with a view of informing larger scale studies.

Methods

Data collection

This cross-sectional exploratory study used an unpublished questionnaire, designed by the authors, to gather data. Demographic data were collected, including age, gender and whether respondents were in a high-risk category for severe COVID-19. The questionnaire asked whether respondents had downloaded the trial app and why, and if they had concerns about using the app and why. It also asked them to rate their level of fear of contracting COVID-19 out of five, with one indicating no fear and five indicating extreme fear. This mixture of quantitative and qualitative data was collected so that behaviours could be both identified and understood.

The questionnaire was designed on an online survey website and completed anonymously. It was distributed through social media platforms, leading to a self-selected study population. To be eligible to complete the survey, respondents had to be aged 18 years or over and live on the Isle of Wight. The questionnaire was live for 3 weeks, from 11 May–1 June 2020. This was considered enough time to collect a sample that would be sufficient for the study, while also acknowledging the importance of carrying out this research in a timely manner to add to the wider evidence around the COVID-19 pandemic. This questionnaire was piloted on a group of the authors' colleagues who, although not in the potential sample population, were able to give feedback on the quality and clarity of the questions.

Ethical approval was granted by Bournemouth University Research Ethics Committee (Approved 7th May, 2020 ID: 32341). The first page of the questionnaire contained a link to the participation information sheet and participants were asked to consent digitally before entering the study.

Data analysis

Quantitative data were analysed using the Statistical Package for the Social Sciences software, version 26. A Chi square test or Fisher's Exact test (as appropriate) were used to explore the relationships between whether participants downloaded the app and other variables. Where a dependent correlation was found between variables (significant correlation set at $P=<0.05$), a Phi Correlation test was used to identify the strength of the correlation, where 1 was considered a perfect positive correlation, -1 was a perfect negative correlation and 0 was no correlation.

Qualitative data were processed using content analysis (Cohen et al, 2007), with responses being assigned codes to allow similarities to be identified. There were no pre-existing assumptions or frameworks to coding. Each set of qualitative data were analysed by two authors independently, then resultant themes were compared. Any large disparities between themes were discussed by the authors to reach a decision on what the final themes would be.

Results

Overall, 98 participants responded to the questionnaire. However, one of these respondents only completed the age category and were thus removed from the final analysis. Of the remaining 97 respondents, 24 (24.7%) were male, 71 (73.2%) were female and 2 (2.1%) preferred not to state their gender. The age range of respondents was 19–80 years, with a mean age of 48.6 years, a median of 49 years and an interquartile range of 35.5–60.5 years (Table 1). Overall, 50.5% ($n=49$) of participants identified as being in a high-risk group for severe COVID-19, based on the government's criteria at the time of the study.

Table 1. Demographic data of participants, $n=97$.

Characteristic	*n (%)*	Mean (interquartile range)
Gender		
Female	71 (73.2)	N/A
Male	24 (24.7)	N/A
Prefer not to say	2 (2.1)	N/A
Age (years)		
<20	1 (1)	48.64 (35.5–60.5)
20–29	12 (12.2)	
30–39	17 (17.5)	
40–49	19 (19.5)	
50–59	22 (22.7)	
60–69	21 (21.7)	
70–79	4 (4.1)	
80+	1 (1)	

Overall, 74.2% ($n=72$) of participants downloaded the trial app. However, 63.9% ($n=62$) reported that they had concerns about the app.

There was no relationship between gender and likelihood of downloading the app ($P=0.102$), or age and likelihood of downloading the app ($P=0.343$). There was also no relationship between

fear of contracting COVID-19 and downloading the app ($P=0.934$). There was a weak negative correlation between being in a high-risk group for COVID-19 and downloading the app ($P=0.042$, Phi$=-0.206$). There was a strong negative relationship between having concerns about the app and downloading the app ($P=<0.01$, Phi$=-0.47$). Some respondents did not complete the entire questionnaire, so their responses were not included in the analysis of questions they had missed (Table 2).

Table 2. Analysis of respondents' likelihood of downloading the trial app compared with other variables ($n=97$).

Variable	Number of respondents (n)	Downloaded app	Did not download app	P value	Phi coefficient*
Female	71	54	17	P=0.102	N/A
Male	24	18	6		
Prefer not to say	2	0	2		
Age, years (n=97)					
<20	1	1	0	P=0.343	N/A
20–29	12	10	2		
30–39	17	12	5		
40–49	19	15	4		
50–59	21	15	6		
60–69	21	15	6		
70–79	4	2	2		
80+	2	1	1		
Fear of contracting COVID-19 (1= no fear, 5= extreme fear) (n=92)					
1	11	8	3	0.934	N/A
2	17	13	4		
3	21	17	3		
4	25	19	6		
5	19	15	4		
High-risk group status (n=97)					
High-risk	72	32	40	0.042	-0.206
Not high-risk	25	17	8		
Concerns about app (n=88)					
Yes	72	14	58	<0.01	-0.470
No	16	12	4		
*This analysis was only carried out on variables found to have a significant relationship at P=<0.05.					

Concerns about app

There were three main concerns identified, which indicate some important factors preventing respondents from downloading the app. These were privacy or data security concerns, technology issues and increased complacency.

Privacy/data security concerns

Respondents identified concerns that their data may be vulnerable to being acquired by third parties, with comments including:

> *'Use of data is open to abuse from external sources.'*

> *'I am concerned about data safety. Why did other big tech companies refuse to be involved?'*

Participants also reported a mistrust of the what the government would do with their data:

> *'Feels like being spied on.'*

> *'With further powers having been granted to Government Communications Headquarters…it is clear they could choose to find an individual app user if they wanted to.'*

However, some believed that the potential benefits of the app outweighed their concerns around privacy:

> *'I know there been reports of security flaws, but I have to balance the risk with the benefits.'*

Technology issues

Some respondents reported that the age or make of their phone precluded them from being able to download the app, with one stating that:

> *'My phone is 4 years old and the app will not work on it.'*

Another common barrier was that having Bluetooth switched on all the time drained respondents' phone batteries very quickly, making them less likely to download or use the app.

Increased complacency

Some respondents suggested that use of the app would make people more complacent about strictly following the government's advice around social distancing and would result in people taking more risks:

> *'This is giving people a false sense of security, which could lead to more people passing along the virus.'*

> *'It is encouraging people to break the lockdown rules.'*

Reasons that participants did download the app

Analysis identified three main reasons why respondents did download the app. These were compliance, protection and a drive to fight the pandemic and/or return to normal.

Compliance

It was common for respondents to say that they downloaded the app simply because they were asked to, stating:

'Because we were asked to do so.'

'The government wanted us to.'

Protection

Some respondents stated that they downloaded the app to help protect themselves, their families and others:

'...so I can take extra steps to make sure I do not risk spreading the disease within my household.'

'[I downloaded the app] because of our health conditions and daughter going back to work at some point in childcare.'

'To avoid, as far as possible, passing the virus to others.'

Fighting the pandemic and/or returning to normal

A desire to help control or end the pandemic and get back to normal was reported as a reason for downloading the app:

'To help as far as possible in the fight against COVID-19.'

'It is needed to enable life to go back to normal.'

'This could help, I want the pandemic to be over as soon as possible.'

Discussion

This study found a significant negative correlation between having concerns about the app and likelihood of downloading it. Analysis of the qualitative data identified a number of reasons why these concerns existed.

There are reported security vulnerabilities when using Bluetooth technology (Zeadally et al, 2019), suggesting that respondents' concerns about their data security were founded in reality. Although in qualitative analysis the number of times a code is mentioned does not necessarily correlate with its importance (Cohen et al, 2007), privacy was the concern that was raised the most in respondents who had not downloaded the app. Interestingly, some respondents who had downloaded the app were dismissive about the privacy concerns that others' had raised, while others who did have concerns stated that they felt they were being chastised as a result.

Some of the responses in this study suggested a mistrust of how the government might handle public data. This is supported by current research that predicted that people would not download the app because they believed the government would not delete data and/or would use data for purposes other than issues related to COVID-19 (Simko et al, 2020). Evidence suggests that, even when data are adequately protected, it is common for the public in both the UK and abroad to have concerns about using a tracking app (Simko et al, 2020). Research shows that people are more likely to trust

an app made by a trusted organisation (Simko et al, 2020), so it is possible that the NHS's heavy involvement in the app had a positive impact on the number of people who downloaded it. However, this was not the case for the 25.8% of respondents who did not download the app, some of whom made comments indicating that they perceived the app as being from the central government. On the other hand, some participants cited compliance with the government as the only reason that they downloaded the app. Further research could explore factors that affect trust in the government a public health crisis to better understand this issue.

Many participants downloaded the app as they believed it would offer more protection to themselves and their families. Research by Bavel et al (2020) found that media coverage of the pandemic had caused a strong negative emotional state in many people, leading to over-estimation of personal risk and an urge to take strong action to protect oneself. Conversely, those in high-risk groups for COVID-19 were significantly less likely to download the app, although most cited that this was because they were not going out anyway, so they did not see the app as relevant to them. A sense of wanting a return to normality was also a key driver behind downloading the app.

Overall, there appeared to be a sense of community among those who did download the app. Interestingly, much of the language used in the questionnaire answers was the same as the language used by the government in their public health campaigns during the pandemic. For example, these campaigns have put across the message that testing and self-isolation are a 'civic duty' (Mahase, 2020), which was reflected in some of the responses for downloading the app. This type of message has been shown to influence behaviour during pandemics (Everett et al, 2020; Gouin, 2020) and is supported by this study. Similarly, government and media use of the concept of 'fighting' the virus was also reflected in the questionnaire responses. This type of language has long been used when faced with disease, such as the 'fight against cancer' (Fleischman, 1999; Seale, 2001), hence its familiarity with the public. It is possible that this concept contributed to the decision to download the app in many respondents. This could inform further research into how use of language in public health campaigns and media coverage may influence public behavior during a crisis.

Limitations

The sample in this study was self-selecting and so the results are not necessarily representative of the whole population of the Isle of Wight, as the self-selecting method may have encouraged those with stronger views to enter the study. Additionally, the questionnaire was completed online, so those without access to the internet or who were not technically literate would not have entered the study. This may have adversely affected the chances of the older population participating and inflated the percentage of people who would download the app. Larger-scale studies should address this issue. The sample was also a small cross-section of a pilot cohort, so generalisation to a national population should be done with extreme caution. Finally, time constraints prevented more thorough piloting of the questionnaire.

Conclusions

Concerns about the NHS COVID-19 tracking app, particularly those related to privacy and security, may be an important factor influencing whether an individual decides to download the app. However, 74.2% of participants did download the app in the pilot trial on the Isle of Wight, which is close to the 75% needed to make the intervention effective. The themes discussed could help to direct further, larger-scale studies into factors that influence engagement with public health initiatives, including apps, during a crisis.

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