Why do people hesitate to use contact tracing apps?

Abstract

Digital contact tracing apps (e.g. COCOA) have been identified as a promising approach to control the spread of viruses, but their usage has been low. Therefore, we investigated people's attitudes about installing and using COCOA, and found that their decisions were shaped by social norms, as well as protecting themselves from financial loss, prejudice, and discrimination. We found that, even if installed, efforts to protect oneself from financial risk and prejudice may cause people not to use the app effectively. Based on this, we identify ways to address people's fears in order to encourage effective use, which is necessary to control the pandemic. The results have implications for the design of future communication technologies that address large collective goals while preserving individual rights. By realizing this, we can help overcome important social problems such as climate change and public health emergencies.

Covid-19 Contact Confirming app (COCOA)

COCOA is a contact tracing app released by the Japanese government.

It uses BlueTooth to detect when people are in close contact and sends an exposure notification to people who have been near an infected person.
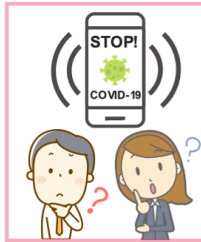
The more people use a contact tracing app, the more COVID-19 cases will be reduced.

Worldwide, contact tracing app adoption is much lower than hoped.
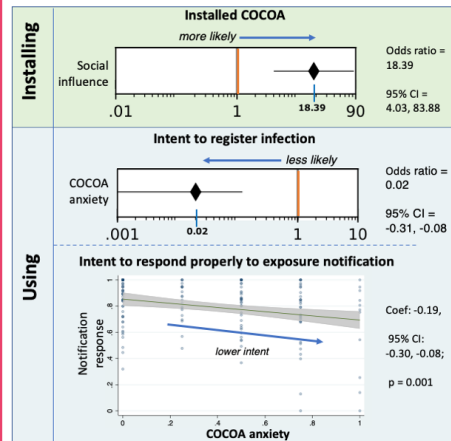
General goal: 60% [1]
Reality in Japan: <27% [2]
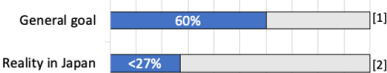
→ There is a need to understand why people use or do not use contact tracing apps.

[1] Hinch, R., et al.. "Effective configurations of a digital contact tracing app: A report to NHSX," 2020.
[2] 厚生労働省, "新型コロナウイルス接触確認アプリ," 2022. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/cocoa_00138.html

Background and research design

Past work has found that decisions to install a contact tracing app are influenced by, perceived effectiveness, ease of use, social influence, privacy concerns (surveillance), and other factors.

Once installed, there are two ways to use COCOA:

Register to the app if you test positive for COVID-19.

Respond properly if sent an exposure notification.
e.g.: Self-isolate at home, Get a PCR test, Tell family/friends, Tell employer/boss

We extend past work about contact tracing apps by investigating use after installation and fit with daily life.

Research method: Survey (n=153) & interviews (n=15)

Dependent variables:
- *Installed COCOA* (yes/no)
- *Intent to register if infected* (5-point ordinal)
- *Intent to respond properly to notification* (factor variable)

Key independent variables:
- *Social influence:* Knows at least one app user (yes/no).
- *COCOA anxiety:* Believe COCOA increases anxiety (5-point ordinal).

Factors affecting adoption decisions

Installing
Installed COCOA — *more likely*
Social influence
.01 1 18.39 90
Odds ratio = 18.39
95% CI = 4.03, 83.88

Using
Intent to register infection — *less likely*
COCOA anxiety
.001 0.02 1 10
Odds ratio = 0.02
95% CI = -0.31, -0.08

Intent to respond properly to exposure notification
Notification response — *lower intent*
COCOA anxiety
Coef: -0.19,
95% CI: -0.30, -0.08;
p = 0.001

Social influence
= More likely to install

Believe that using COCOA will increase anxiety
= Less likely to use properly:
a) registering infection.
b) responding to notification.

Even if installation increases, proper use may be low.

29% said COCOA would make them **more anxious.** *Why?*

Fear of stigmatization in community
"Since I live in the countryside, people will immediately identify who I am and the rumors after infection will be very serious." (P15-S)

Fear of financial loss
"I'm a little worried [about getting a notification] because I see in the news that people will lose their job when they disclose to the workplace." (P15-S)

Consequences for COCOA use
- Hiding infection information from others
- Not registering to COCOA if infected

Implications and future work

App can create fears of social harm →
Introduce design features to create social rewards.

Design beyond the app →
Collaborate with institutions to reduce stigma (e.g., local governments, workplaces, schools).

Beyond the pandemic →
Next steps: Build on this research to use personal communication technology to address future collective challenges (e.g., climate change, caring for eldery)

References

[1] J. Jamieson, N. Yamashita, D.A. Epstein, Y. Chen, "Deciding if and how to use a COVID-19 contact tracing app: Influences of social factors on individual use in Japan," in *Proc. ACM Hum.-Comput. Interact. 5, CSCW2, Article 481, (CSCW'21)*, pp. 1–30, 2021.
[2] J. Jamieson, D.A. Epstein, Y. Chen, N. Yamashita, "Unpacking intention and behavior: Explaining contact tracing app adoption and hesitancy in the United States," in *Proc. the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*, pp. 1–14, 2022.

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