What have we learnt from contact tracing apps?

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Stop COVID-19

covTRACER-EN

eRouška

HOIA
protect yourself and your closest ones

Koronavilkku

THE CORONA-WARN-APP:
GET ANSWERS TO THE MOST IMPORTANT QUESTIONS HERE.

COVIDAlert
What is Contact Tracing App?

• mobile solutions that can detect and trace other app-carrying individuals who have had contact with one another that would risk COVID-19 transmission if one were to be infected.
How it works?

- Global positioning system (GPS) technology
- Bluetooth® LE and ultrasound
- Ultra-wide band (UWB)

Types of Contact Tracing Apps

Decentralized

• Model of contact tracing apps, where public health officials are not able to retrieve data from certain users

Centralized

• Model of contact tracing apps, where public health officials receive the app data of patients with COVID-19

Issue 1. Lack access to a smartphone due to factors such as socioeconomic status, residency status or age.

Number of smartphone users worldwide

Penetration rate of smartphones in selected countries 2020


Share of adults in the United States who owned a smartphone from 2015 to 2021, by age group


Portables Equipment Used by Age Group in Singapore

Infocomm Media Development Authority. Annual survey on Infocomm usage in households and by individuals for 2019,
Solution: Contact tracing wearables

• A physical device that exchanges Bluetooth signals with other wearables or mobile apps nearby


eHealth Program to Reduce Hospitalizations Due to Acute Exacerbation of Chronic Obstructive Pulmonary Disease: Retrospective Study

Questionnaire app to monitor symptoms.

Smartwatch with built-in step counter.
Issue 2. Insufficient public uptake

• Lack of information and misconceptions surrounding COVID-19 contact tracing apps

I think they wanted to develop an app or something, so you would know how many Covid cases are in your area, so you know where not to go. So, if everyone got sent a test and managed in certain areas not go out until everyone has been tested, so you know where the virus is so you know who can leave their homes and who can’t (Participant 6, male, 20s)

• Concerns over privacy

Contact tracing seems quite Big Brotherly. I don’t think I am willing to submit all my data and all of my contacts for the government to scrutinise who I see regularly. I don’t think I will be willing to join the contact tracing apps (Participant 16, female, 30s)

• Concerns over stigma

I actually think that [the contact tracing app] is a terrifying concept... it’s like being branded with a. horrendous black mark. ... I could look and be like my friend, my neighbour has got Covid. (Participant 17, male, 20s)

• Concerns over uptake

We have only reduced or flattened the curve because we have all collectively socially distanced ... and if people were to download the app I think it would have to be done in a large group of people if not everybody for it to be effective ... I don’t know how effective it would be in terms of transmission rates. I wouldn’t rush to download it. (Participant 17, male, 20s)

• Contact tracing as ‘the greater good’

I would do it if it helps but it’s not something I want to do. (Participant 8, female, 40s)

Solution: Co-creation process

- Action Research
- Participatory Action Research
- Participatory Appreciative Action and Reflection

![User experience Honeycomb model by Morville](https://medium.com/)

Leask, Calum F., et al. (2019)
OPTImising the implementation of pulmonary rehAbiLitation in people with chronic obstructive pulmonary disease (the OPTIMAL study): mixed methods study protocol

Sarah Hug\(^1,2\), Vinicius Cavalheri\(^1,3,4\), Daniel F. Gucciardi\(^1\), Richard Norman\(^3\) and Kylie Hill\(^1,4\)

**Phase 1**
Observe target behaviours to quantify current implementation of pulmonary rehabilitation.

**Phase 2**
Explore the determinants of target behaviours from the perspectives of healthcare professionals, people with COPD and their primary support.

**Phase 3**
Co-creation, field testing and implementation of strategies to optimise target behaviours.

**Phase 4**
Evaluate the influence of co-created strategies on target behaviours pertaining to the implementation of pulmonary rehabilitation.

*Fig. 1* Study design flow diagram
Hackers use fake contact tracing apps in attempt to install banking malware on Android phones
How we can protect end-users’ personal data?

• **Data minimisation** - only the data which are strictly necessary for the running of the service are collected, nothing more.

• Apps should use proximity data based on Bluetooth technology.

• Apps do not track people's movements.

• The data should not be stored longer than necessary.

• The data should be protected through state-of-the-art techniques.

• **Integrity and confidentiality** - personal data must be processed by controllers only in a manner that ensures the appropriate level of security and confidentiality.

• **Accountability** - controllers are responsible for data protection.

Data interoperability

Is this app potentially interoperable?

Can this app already talk to another app?
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Data interoperability for chronic lung diseases
Not sure if thank you for your attention

or thank you for not sleeping during the presentation
List of references


• Mobile applications to support contact tracing in the EU's fight against COVID-19 Common EU Toolbox for Member States, Version 1.0, 15.04.2020
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• van Buul AR, Derksen C, Hoedemaker O, van Dijk O, Chavannes NH, Kasteleyn MJ. eHealth Program to Reduce Hospitalizations Due to Acute Exacerbation of Chronic Obstructive Pulmonary Disease: Retrospective Study. JMIR Form Res. 2021;5(3):e24726. Published 2021 Mar 18. doi:10.2196/24726
• Hug, S., Cavalheri, V., Gucciardi, D.F. et al. OPTimising the implementation of pulMonary rehAbiLitation in people with chronic obstructive pulmonary disease (the OPTIMAL study): mixed methods study protocol. BMC Pulm Med 20, 286 (2020).