

COVID-19: The Internet of Things and Cybersecurity

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The COVID-19 pandemic has inspired a range of Internet of Things (IoT) innovations to help stop the spread of the virus. This is the thirteenth edition of COVID-19: IoT and Cybersecurity.

Past editions are found on the [PETRAS website](#).

Technical development on the new NHSX app is progressing

The NHSX app, now announced to be based on the Google/Apple API, is now undergoing further development with the intention to [solve a technical issue on how distance is estimated](#)¹. Once launched, the app will complement the ongoing, current, NHS Test and Trace service.

Research by The Alan Turing Institute on 'smoothing algorithms' that can [better estimate the distance](#)² by analysing Bluetooth signal strength is due to be published on 7 July and will appear on arXiv ([most likely at this location](#)³) this week.

On 6 July, in a session of the Science and Technology Committee, Baroness Harding, Chair, NHS Improvement, and Simon Thompson, Managing Director of the NHS COVID-19 App, [gave evidence on the timing of the new app](#), stating that 'often technology development paths do not run in a smooth and linear way, so we are keen not to commit to a specific date as the technology development is ongoing'.⁴ Key questions asked of expert witnesses at this hearing are found in Box 1.

Overview

- Development is underway to solve technical issues of how distance is estimated using Bluetooth
- A pre-action legal letter has been sent asking for a Data Protection Impact Assessment to be completed for the entire NHS Test and Trace system
- Expert witnesses were questioned by the Science and Technology Committee on the NHS Test and Trace programme
- The contact tracing app for Ireland has now been released and reviewed
- The Ada Lovelace Institute has published learnings from public consultation on deploying data-driven technologies to manage the pandemic
- Recommendations for combating misinformation online have been released by the Select Committee on Democracy and Digital Technologies and Unicef
- Australia is investigating data sovereignty for personal data
- Updates on the working from home digital transformation

In England, [over 150,000 people](#)⁵ have had their contact details reported to the NHS Test and Trace contact tracing system in the first 4 weeks of operation. Under the [Data Protection Act 2018](#)⁶ and [GDPR Article 35](#)⁷, it is a mandatory legal requirement to conduct a Data Protection Impact Assessment (DPIA) when processing personal information. This has not been done for the NHS Test and Trace process. A pre-action legal letter (and associated [funding campaign](#)⁸) has been sent by the Open Rights Group to the Department of Health and Social Care (DHSC) and the Secretary for Health and Social Care, [stating that the group will file for a judicial review](#) after 8 July if DPIA is not completed. The ICO says that it is reviewing a DPIA for 'parts' of the Test and Trace system.

The initial data retention period for the Test and Trace data [was to be 20 years](#).⁹ Following

Box 1: Insights from expert witness questioning by the Science and Technology Committee on The Science of COVID-19 on NHS Test and Trace

Timings refer to the [recording of the session](#).

16:00:54 What types of data is being collected by a) the app and b) ONS?

16:05:10 Main ethical and privacy concerns around the data? Is there clarity of purpose?

16:08:40 Who has access to Test and Trace data? What is it being used for beyond contact tracing?

16:10:56 Is there a way that data sharing can be put in place quickly without having data privacy issues?

16:13:15 What are the ethical implications on widespread antibody testing for the purpose of providing certifications of immunity? Mention of the [Nuffield Rapid Policy Briefing](#)³² on COVID-19 antibody testing and 'immunity certification' and proposed [The Coronavirus \(Safeguards\) Bill 2020](#).³³

16:19:30 Is there any likelihood of behaviour change if immunity passports were rolled out?

16:21:08 Who should have access to contact tracing data?

16:24:20 How will decentralised approaches overcome some of these concerns? What is the minimum data that we need to collect for the primary goal of transmission?

16:27:40 What can be done to get the right data to the people who need it in local areas in a timely fashion?

16:32:17 Are the current regulations sufficient to make sure peoples' data is protected and is there a risk that these protections could be overlooked as we're in an emergency?

16:34:10 Will the new app avoid the security and privacy concerns relating to the earlier versions of the app?

16:36:28 How is the government meeting ethical and privacy values?

16:42:10 Are there issues of data in this crisis that you would like to give advice on that you haven't yet?

16:44:07 Who do you regard as the most vulnerable groups? Are they being brought into systems adequately?

16:49:39 What can we do to make sure the data is used appropriately and ensure public trust and confidence going forward? How can the government and private sector ethically and appropriately gather this data?

16:58:53 Is there a country whose apps that you would point to as exemplars that get the balance right?

questioning by the Open Rights Group on how this time frame was necessary for the purposes for which it was processed, this was [reduced to 8 years](#).¹⁰

The contact tracing app for Ireland has now been released and reviewed

The [COVID Tracker App for Ireland](#)¹¹ is now available for download. In addition to contact tracing using the Google/Apple Exposure Notification system, the app has a Check-In function, where the user is prompted to [complete a daily symptom checker](#)¹².

The [DPIA](#)¹³ for the COVID Tracker App for Ireland was submitted on 26 June by the HSE and the Department of Health (the 'data controllers'). A review of the DPIA by the Irish Data Protection Commission [provides recommendations for improvement on data protection](#) and compliance with data protection legislative frameworks.¹⁴ These recommendations were [accepted and logged](#)¹⁵. Compliance with the European Data Protection Board guidelines and EU Toolbox for COVID-19 apps are also [available on GitHub](#)¹⁶.

A [pre-release report card](#) by the Irish Council for Civil Liberties and Digital Rights Ireland gives low scores for the app's efficacy, clear and limited purpose, and statutory oversight, however, it commends good faith efforts towards transparency. The main concerns are over how accurately the Bluetooth can estimate distance, and that location data and symptom tracking capabilities extend the app beyond a single purpose (against European data protection guidance).¹⁷

Learnings from public consultation provide insights on deploying data-driven technologies to manage the pandemic

The Ada Lovelace Institute has been [conducting public deliberation projects](#)¹⁸ throughout the pandemic, and has produced a [report on insights on deploying data-driven technologies in a pandemic](#) and finding out what risks are acceptable. The report identifies six lessons from the public that highlight that the deployment of new technologies in a crisis is not straightforward, and also that 'citizens have the capacity to weigh these challenging issues'.¹⁹

Combating misinformation online

The Select Committee on Democracy and Digital Technologies published the report '[Digital Technology and the Resurrection of Trust](#)' on 29 June. By outlining 45 different recommendations, such as: 'The Government should introduce Online Harms legislation within a year of this Report's publication', the report seeks to highlight and tackle the current 'pandemic of information that poses an existential threat to our democracy and way of life'.²⁰

Unicef published a research brief on how [children's digital access during the pandemic](#). The report explores how children access health information on the internet and whether they can verify the truth on online information. Recommendations are given on how children's health information needs can be better supported during the COVID-19 pandemic²¹.

More debates on immunity passports

An article in a US context investigates the emergence of blockchain-enabled 'immunity certificates' for COVID-19 (such as the [COVID-19 Credentials Initiative](#)²²) from a [legal, public health-based, and technical perspective](#). The authors conclude that these immunity certificates pose an 'unjustified interference with, and serious threat to, our fundamental human rights and civil liberties, in violation of the principles of legality, necessity, and proportionality'²³.

Australia investigating data sovereignty

After [concerns](#)²⁴ surrounding the hosting of Australian COVIDSafe app data in the US, the Australian government has announced that it is examining whether a '[sovereignty requirement...](#) should apply to certain datasets held by government' where these datasets would be 'hosted in Australia, in accredited data centre, across Australian networks and only accessed by the Australian government and our Australian service providers'.²⁵

Working from home

Digital transformation in working

The number of people video conferencing has skyrocketed since the beginning of the pandemic. Microsoft Teams [reached 4.1bn minutes in just one day in April](#), compared to a daily average of 900

minutes in March.²⁶

The use of Virtual Reality (VR) as a way of working is also beginning to gain interest. The head of VR and Augmented Reality (AR) at PwC, Jeremy Dalton, believes the pandemic is '[accelerating interest](#) in the technology in a number of areas, including recruitment'.²⁷

Facebook has also accelerated its work on 'mixed reality' (a combination of AR and VR). The tech giant is also hoping to develop a '[super-powered augmented workspace](#)' in the future.²⁸ Employees would be able to wear a headset and enter a virtual work environment. Facebook's Oculus has [stated](#) that 'You can have all the documents you want, you can see everybody spatially, you can turn your head and talk to somebody'.²⁹ A short eight-second [teaser video](#) of what this may look like has been published on Twitter.³⁰

Understanding the risks

As businesses embrace this digital transformation, a [thorough understanding of the potential risks](#) is necessary to ensure employee and customer privacy. 'There are examples of businesses rolling out systems and platforms that they would normally take half a year to plan, research, scope and test, and they are doing it over a weekend,' says the chief technology officer at cyber security company CrowdStrike. 'This risks undermining businesses' cyber security architecture', he warns.³¹

Endnotes

- 1 <https://www.gov.uk/government/news/next-phase-of-nhs-coronavirus-covid-19-app-announced>
- 2 <https://www.ft.com/content/2fb504a3-fbc7-40a8-8996-f7dae596c831>
- 3 <https://arxiv.org/search/cs?searchtype=author&query=Briers%2C+M>
- 4 <https://parliamentlive.tv/Event/Index/6859b790-76f5-4842-995e-fed1bb13f2e1>
- 5 <https://www.gov.uk/government/publications/nhs-test-and-trace-statistics-england-18-june-to-24-june-2020/weekly-nhs-test-and-trace-bulletin-england-18-24-june-2020>
- 6
- 7 <https://www.privacy-regulation.eu/en/article-35-data-protection-impact-assessment-GDPR.htm>
- 8 <https://www.openrightsgroup.org/campaign/demand-privacy-protections-for-test-trace/>
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- 10 <https://twitter.com/RaviNa1k/status/1276473497695502337>
- 11 <https://covidtracker.gov.ie/>
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- 24 <https://www.abc.net.au/news/2020-04-28/covidsafe-tracing-app-data-may-not-be-protected-from-usa/12189372>
- 25 <https://www.itnews.com.au/news/govt-ponders-new-sovereignty-rules-for-datasets-550162>
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