

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 fifteenth edition of COVID-19: IoT and Cybersecurity.

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

Examining the flaws in the NHSX contact tracing app solution

A [long read report](#) has summarised the timeline of the NHSX contact tracing app development, and quotes inside sources agreeing on two fundamental flaws of the project. The first flaw involves the changing expectations and commitments made by the Secretary of State for Health and Social Care and the engineers developing the app. The report states that insiders felt they were 'set up for highly public failure, and regret the loss of time and public trust'. The second flaw was the lack of 'complete clarity about exactly what the app was for' which resulted in a 'hodge-podge of suppliers and contractors' moving quickly, with 'no one person who was responsible for delivery'.

The article concludes that it is 'unclear whether England will ever have a contact tracing app' and that the government is hoping that 'Google and Apple will integrate NHSX's work on Bluetooth into their framework'.¹

The infection rate across the Isle of Wight decreased during the contact tracing app trial, but data does not establish a causal link

[Initial findings](#) of the Test and Trace programme on the Isle of Wight, including the test version of the NHS

Overview

- Further insights into the development of the now abandoned centralised NHSX contact tracing app show two fundamental flaws on expectations and clarity
- The infection rate decreased on the Isle of Wight during trials for the NHSX contact tracing app, however, there is no evidence of a causal link
- Without a Data Protection Impact Assessment, the NHS Test and Trace programme has been deemed unlawful by privacy groups
- The Irish contact tracing app has had high uptake in Ireland, with 35% of the adult population downloading the app in the first 8 days
- The app is open source and available to other public health authorities
- The European Court of Justice has struck down the EU-US Privacy Shield, which may present problems for the Irish contact tracing app as it outsources its messaging service to a US company
- Cyber attacks on organisations involved in COVID-19 vaccine development
- Research warns users of video conferencing platforms to not post images of these conference calls on social media as personal details can be gleaned from image processing algorithms and cross-referenced with social media

contact tracing app, have been released. Analysis on the course of the epidemic on the Isle of Wight was undertaken before and after the TTI programme and the release of the app. The results are encouraging. The team 'observed significant decreases in incidence [of new infections] and R...immediately after the launch'.²

The researchers conclude that their analysis does not establish a causal link between the programme and the drop in R rate on the Isle of Wight. In response to whether the [use of the contact tracing app made an impact](#), the lead researcher states that 'To tease

apart the impact of the app we would need to know things like: of the people testing positive, how many were already self-isolating because they had received an app notification? That would tell us how well the app was performing in staying one step ahead of the virus and giving infected people the information they needed so that they did not infect others'.³

Without a Data Protection Impact Assessment, the NHS Test and Trace programme has been deemed unlawful

The [Open Rights Group](#)⁴ (ORG) has stated that the [Test and Trace programme has been unlawful](#) since its launch on 28 May following the Department of Health admitting to not having conducted a [data protection impact assessment](#)⁵ (DPIA) when the initiative began.

By not undertaking a DPIA, ORG's executive director believes the government has been 'reckless'. The director adds that 'a crucial element in the fight against the pandemic is mutual trust between the public and the government, which is undermined by their operating the programme without basic privacy safeguards'.⁶

The government has stated they are working with the Information Commissioner's Office (ICO) to ensure all data processing is lawful. The ICO has said they are providing guidance as 'a critical friend'.⁷ The ICO is [already investigating the initiative](#) following reports patient data had been shared on social media.⁸

A case study reporting on the [timeline and legal action](#)⁹ taken since 1 May 2020 notes that the [initial legal opinion](#)¹⁰ was written and distributed prior to the deployment of the Test and Trace programme on 28 May. A [pre-action letter](#)¹¹ and the [government's response](#)¹² followed in July.

High uptake of the Irish contact tracing app

The Irish contact tracing app, the [Covid Tracker app](#)¹³, launched on 6 July and was downloaded [1.3 million times in 8 days](#)¹⁴ (35% of the adult population). [Commentary](#) suggests that the high download rate could be due to strong social and community bonds in Ireland, vulnerability, increased campaigning to recognise misinformation, and transparency through the development period. It is still too early to call it a success, and consideration of language inclusivity and accessibility needs to be seen in future updates.¹⁵

The Irish Covid Tracker forms the base of the Northern Ireland's contact tracing app, which is expected to be [released at the end of July](#).¹⁶ [Wales has also expressed interest](#) in the app¹⁷.

A [history of programming the app](#) has been written by the Irish company which developed the app. Notably, the team states that while they first developed a centralised app, when they realised there would be usability issues, they contacted Apple and Google, pivoted to a decentralised model, and secured beta access to the new Apple and Google framework.¹⁸

The [source code](#)¹⁹ for the Irish contact tracing app has been donated to the [Linux Foundation Public Health project](#)²⁰ to 'enable public health authorities to get a contact tracing application into production within four weeks of project start'.²¹

The [messaging part](#)²² of the contact tracing app is [outsourced](#)²³ to a US company which may [be affected](#)²⁴ by the ruling of the European Court of Justice on 16 July, invalidating the privacy shield agreement for sharing data between the EU and the US (below). This [affects EU companies which export data to third countries](#) with whom the EU does not have a data adequacy agreement.²⁵

Privacy experts welcome a judgement to invalidate the EU-US Privacy Shield, however EU/EEA companies need to reassess US data processing

The European Court of Justice [has struck down](#)²⁶ the [EU-US Privacy Shield](#)²⁷ after privacy advocate Max Schrems [challenged the agreement](#) on the basis that US national security laws did not protect EU citizens from US government surveillance.²⁸

The EU-US Privacy Shield [framework](#)²⁹ provided 'a method for companies to [transfer personal data](#) to the United States from the European Union in a way that [was] consistent with EU law'.³⁰ Now that this framework is invalid, EU/EEA companies '[need to assess](#) if their processing of personal data needs to be outsourced to US processors' and if so, 'need to identify the legal basis for the data transfer'.³¹ This could be in the form of derogations in Article 49 GDPR, or [standard contractual clauses](#) (SCCs)³² or [Binding Corporate Rules](#)³³. According to University College London's European Institute, 'approximately 65% of Privacy Shield certified firms are SMEs' which [may lack](#) sufficient resources to set up SCC.³⁴

Cyber attacks on organisations involved in COVID-19 vaccine development

The National Cyber Security Centre (NCSC) exposed an [‘ongoing campaign of malicious activity’](#) targeting coronavirus vaccine research and development globally’. The work ([full report](#)³⁵) has assessed that ATP29 is a cyber espionage group which is ‘most certainly part of the Russian intelligence services’. The group has targeted COVID-19 vaccine development in Canada, the US and the UK, ‘highly likely with the intention of stealing information and intellectual property relating to the development and testing of COVID-19 vaccines’.³⁶

Remote working, cybercrime and privacy

Interest in remote-working [has spiked](#) since the beginning of the pandemic³⁷, but so has the [risk of experiencing cybercrime](#).³⁸ For instance, with their London-based staff all working remotely, a UK architectural firm experienced a security breach and data theft in a [ransomware attack](#).

The BBC has traced [five of the email scams](#) linked to the COVID-19 response which have targeted individuals and industries. In response, the NCSC released a [Suspicious Email Reporting Service](#).³⁹

Many organisations are now using video conferencing platforms like Microsoft Teams, Zoom and Google Meet. A recent [preprint](#)⁴⁰ warns users of these platforms to not [post images](#)⁴¹ of these conference calls on social media. Researchers have used image processing algorithms and text recognition to identify personal data⁴² such as gender, age, and usernames from these images which can then be cross-referenced with social media. This can be a [privacy risk](#) as it ‘is possible to identify a user that appears in several video conference meetings and maliciously aggregate different information sources about the targeted individual’.⁴³

Endnotes

- 1 <https://news.sky.com/story/coronavirus-the-inside-story-of-how-government-failed-to-develop-a-contact-tracing-app-12031282>
- 2 <https://www.medrxiv.org/content/10.1101/2020.07.12.20151753v1.full.pdf>
- 3 <https://www.zdnet.com/article/the-nhsxs-contact-tracing-app-might-have-actually-worked/>
- 4 <https://www.openrightsgroup.org/campaign/demand-protection-privacy-protections-for-test-trace/>
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- 6 <https://www.bbc.com/news/technology-53466471>
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- 23 <https://www2.hse.ie/services/covid-tracker-app/red-c-bru-trial-dpin-covid-tracker-app.pdf> [Section 10]
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