THE ANDREW MARR SHOW, 26TH APRIL, 2020
Professor CHRISTOPHE FRASER
University of Oxford, advising on new NHSX app

AM: Christophe Fraser is the Oxford epidemiologist working on the government's and the NHS app and knows how this app is going to work. I spoke to him a little earlier. I asked him first, how many people he thinks in this country have or have had Coronavirus so far?
CF: Well so there's uncertainty around this but I would say nationally somewhere between sort of 3 and maybe up to 10% of the population will have had Coronavirus by this stage, based on – you know we're still waiting for the definitive studies based on immunological assays, but this is based on our understanding base of the spread of Coronavirus.

AM: So several million people up to six million people, that kind of figure?
CF: That kind of figure. Probably a bit less.
AM: When it comes to this app how many people are going to have use the app for it to work?
CF: Well, I think the app can work independent of how many people use it, but I think in order to encourage people to use it we need to explain what the app is for and why this was developed as a public health strategy. So the problem that the app addresses is the transmission of this virus, the Covid virus, is at about 50% of transmissions occur before symptoms, so it's a very rapidly transmitted virus and some people have very mild infections. So you know, so the issue is that contact tracing is about identifying people who are risk of transmitting the virus and the traditional way of doing it which takes several days which we were modelling at the start, just isn't quick enough to get the message to people that empowers people to not go on and spread the virus. So the app is solving, you know, a specific

problem which is how do you get the message that you're at risk and empower you to take measures to protect your friends, your family, your colleagues and the people you've been in contact with to help prevent spread the virus.

AM; But for it to work in the population lots and lots and lots of us are going to have download it on our phones and go out with you. I ask you again, roughly speaking what kind of percentage are going to have to be using this app for it to really crack the virus?
CF: Well the app is going to be one of the building blocks of how to get out of the epidemic and we have two estimates. We found that when we projected over the next three months for every one to two users who download the app and who adhere to the instructions, you'll prevent one infection. And we found that for this intervention alone to stop resurgence of the epidemic, about 60% of the population would have to use the app. Now that number may be a bit smaller if there were other interventions going on which we hope there will be: social distancing, large community testing and indeed manual contract tracing.

AM: But that's about 80% I think of modern smart phone users would have to download it. Once it downloaded, and I've got it on my phone, I go out, what happens if I get an alert saying you have been near somebody with Covid-19, what happens next?
CF: So the intervention is part of a public health intervention, so there would have been messaging that this is part of a test and tracing campaign, so the notification will take place in a context where there's a lot of description as to what's going on and we've been modelling different configurations. So what happens next is you'll either get a message which says you've been in contact with a suspect case of Covid, we're trying to get the message across as quickly as possible, and that's what we've found is the most - has the most impact on the epidemic, or you have may later get a message saying you've been in contact with a confirmed case. Now at that point we would recommend a degree of isolation, of

increased social distancing and in the case of being in contact of a confirmed case quarantine for a number of days, sort of 14 days after the contact has taken place.

AM: And just a technical thing, do I have to keep the app working on my phone all the time I'm out?
CF: No. So the app would work in the background. You need to enable the low energy Bluetooth. So the way it works is when you install the app, this is an opt in system so you have to enable the app and then it will work in the background. Obviously you have to have your phone with you and your phone builds up a memory of the sort of anonymous IDs of the other phones you come into contact with and it needs to be a contact which is going to be long enough that there's a risk of transmission, and then when you're sick, when you're diagnosed you'll be asked to anonymously notify those contacts. And this is another strength of the system that the people who might have been sitting next to on a bus who you wouldn't be able to recall otherwise would receive an anonymous notification that they've been in contact with somebody who's either a suspect or a confirmed case of Covid.

AM: So this uses Bluetooth phone to phone. So if I'm sitting beside somebody on a bus or I pass them in a street that's fairly straight forward. What about a wall between us? What happens if my neighbour has got Covid-19 and I'm standing a couple of yards away but on the other side of a wall? Is the app able to distinguishes between those two situations?
CF: So low energy Bluetooth, this is low energy Bluetooth so it has – over an extended period of time we wouldn't measure the single strength over a single ping, but the app is being validated by engineers in multiple countries, including extensive validation in the UK, to precisely answer those questions and to make sure that it's – the contacts which are the most likely to result in transmission which are recorded.

AM: I guess where all of this is leading, Professor, is to the question of security and privacy because for different reasons there are lots of people who don't necessarily want other people to know exactly where they are all the time. How sure can people be that the information is used only for its primary purpose and is entirely secure within the NHS app?
CF: Well so NHS the records patient data already and we trust the NHS to look after private data and this is being developed – transparency with you know NHS has engaged experts in privacy and people need to remember that this is being designed with a relatively minimal amount of data, as much data as it needed to make it work and it's a public health intervention within – with data collected within the health system.

AM: Talking about the NHS there are lots and lots of NHS workers who are in direct contact with people with Covid-19 every day and hour of their working lives. Presumably the app doesn't really work for them?
CF: So indeed and a configuration is being developed for health care workers. It's nonetheless important that health care workers, if they become infected will also want or should be empowered for that information to be passed on you know to their friends and colleagues in the community, but indeed we need to account for and are accounting for those contacts in hospital.

AM: This is a really complicated and difficult thing you are doing. How long do you think it is before the technology will be there and enough people will have downloaded an app for this to get going?
CF: The aim is to develop – to release this within weeks and to – but you know as soon as, like all of these things, as soon as all of the testing and all of the engineering and all of the modelling and all of the policy review and the behavioural review and the ethics review and the engagement has been done.

AM: Finally, do you think if we had pursued this policy earlier on lives would have been saved?

CF: I think so. I worked on the SARS epidemic in 2003 and testing and tracing is really a cornerstone of how you stop a serious infection and I do think that that strategy you know scaled up is tremendously effective.

AM; Well Professor Fraser you've been very generous with your time thanks so much for joining us this morning.

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