SORS: Digital contact tracing and precision epidemiology: insights from a new tool to reduce and understand the transmission of respiratory pathogens

Abstract

Digital contact tracing is a new public health approach developed and deployed worldwide during the COVID-19 pandemic. Contact-tracing apps measure proximity and duration of close contacts, allowing individuals who have been exposed to SARS-CoV-2 to be rapidly notified. At the same time, these apps represent a novel measurement tool for precision epidemiology.

Here we present the main empirical insights from the NHS COVID-19 app used in England and Wales. First, we demonstrate that this intervention had a significant epidemiological impact. Then, we show how such apps reveal unique quantitative insights into individual and population determinants of pathogen transmission. We also illustrate how the app's capabilities for precision epidemic surveillance at scale offer near-real-time information on epidemic dynamics at unprecedented resolution, focusing on exceptional events such as the Euro football tournament in 2021. Finally, we discuss the importance of precision epidemiology, big data and AI for a rapid response to future epidemics.

Short Bio

Dr. Luca Ferretti is a Career Development Fellow of the Pandemic Sciences Institute of the University of Oxford with extensive multidisciplinary experience in complex systems, genomics, evolution and epidemiology of infectious diseases. His research revolves around models and methods to analyse and understand the epidemiological and evolutionary dynamics of viral pathogens. Dr. Ferretti's seminal work

on digital contact tracing and COVID-19 epidemiology has been pivotal for the development of contact-tracing apps around the world. He has advised multiple governments, actively supported the deployment and evaluation of the highly successful NHS COVID-19 app, and produced the first large-scale evidence of the epidemiological impact and monitoring capabilities of such apps. He is passionate about designing, implementing and evaluating novel options for precision epidemiology and epidemic management and control.

Speakers

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