Researchers developing risk prediction model for smarter COVID-19 shielding advice

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Clinicians and GPs will soon be able to better identify patients who are at a higher risk of serious illness from COVID-19 infection based on a new data-driven risk prediction model, now under development by a team involving University of Liverpool researchers, supported by NHS Digital.

In the UK, government guidance on COVID-19 identifies individuals based on three broad categories of risk, with those who are 'clinically extremely vulnerable' to the disease previously being advised to shield themselves from the virus.

This new model could be applied in a variety of health and care settings, including supporting GPs and specialists in consultations with their patients to provide more targeted advice based on individual levels of risk.

Routinely collected anonymised electronic health records of 8 million adults in the UK, accessed through the University of Oxford's QResearch database and linked datasets will be analyzed to identify factors that can be used to predict those at highest risk of infection and serious illness from COVID-19. These include age, sex, ethnicity, deprivation, smoking status, body mass index, pre-existing medical conditions and current medications.

Algorithms from the data analysis, will be developed in conjunction with clinical and data experts at NHS Digital and will drive a clinical risk prediction model which can be applied across various health and care settings. Individualized risk assessment could be used to improve shared decision-making between clinicians and patients based on more accurate information as well as discussions on how to reduce risk.

The model could also be used to inform mathematical modeling of the potential impact of national public health policies on shielding and preventing infection and potentially help identify those at highest risk to be vaccinated, when available.

The project was a commission from the Office of the Chief Medical Officer for England to NERVTAG (New and Emerging Respiratory Virus Threats Advisory Group), who established the parameters and

brought together the team as a sub-group of NERVTAG. It is funded by the National Institute for Health Research (NIHR).

This team is led by the University of Oxford and includes researchers from the universities of Liverpool, Cambridge, Edinburgh, Swansea, Leicester, Nottingham with the London School of Hygiene and Tropical Medicine, Queen's University Belfast, Queen Mary University of London, University College London, the Department of Health, NHS Digital and NHS England.

The research team are planning to utilize other datasets from across all four nations of the UK to validate their model and offer a unified approach to evidence-based risk stratification policy.

Calum Semple, Professor in Child Health and Outbreak Medicine, University of Liverpool, said: "Shielding has been extremely important for vulnerable people to keep them safe during the current pandemic. The development of this new risk predication model will ensure the advice they follow is based on the best and most up to date evidence. This will help them to protect themselves until the risk has passed."

Principal Investigator, Professor Julia Hippisley-Cox, Professor of Epidemiology and General Practice at Oxford University's Nuffield Department of Primary Care Health Sciences, said: "Driven by real patient data, this risk assessment tool could enable a more sophisticated approach to identifying and managing those most at risk of infection and more serious COVID-19 disease. Importantly, it will provide better information for GPs to identify and verify individuals in the community who, in consultation with their doctor, may take steps to reduce their risk, or may be advised to shield."

Chief Medical Officer for England, Professor Chris Whitty, said: "The level of threat posed by COVID-19 varies across the population, and as

more is learned about the disease and the risk factors involved, we can start to make risk assessment more nuanced. When developed, this risk prediction tool will improve our ability to target shielding, if it is needed, to those most at risk."

Provided by University of Liverpool