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The UK's covid-19 data collection has been “world beating”—let's not throw it away

It is critical the UK keeps the bones of its world leading data infrastructure so that we can protect ourselves from lingering and future threats, writes Jennifer Beam Dowd

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While the UK's perceived pandemic missteps abound, the country was truly “world beating” in at least one important arena—investment in crucial population data to help us understand the virus. Despite earlier reports that the Coronavirus Infection Survey carried out by the Office for National Statistics (ONS) was at risk of being scrapped, the government's new “Living with covid” strategy has retained the scheme, although it's not yet clear to what extent. While these efforts could rightfully be scaled back from crisis levels, we need to carefully transition surveillance from pandemic to “endemic” to protect ourselves from lingering and future threats.

In a pandemic in which we've been overwhelmed with data, the ONS study has stood apart. Begun as a pilot in April 2020, the massive effort swabbed a random sample of almost 180 000 respondents in the UK each fortnight to test for current SARS-CoV-2 infection, with more than 5.5 million total swabs taken to date.¹ The study follows many people repeatedly, including within households, and also collects antibody data from finger-pricked blood on many respondents to measure both prior infection and response to vaccination. By establishing regular surveillance of covid-19 infections in a large random sample of the population, the study captured positive cases regardless of whether individuals had symptoms and sought out testing or not. The value of having data that are representative of the population, rather than those who self-select into testing, can hardly be overstated. Scientists in the United States who've been flying blind are holding up the ONS as a model and pleading for the establishment of such a survey two years into the pandemic.²

A window into wider trends

The ONS survey has been key in identifying true population trends in infection during the alpha, delta, and omicron waves, especially in younger age groups who are less likely to develop symptoms and seek out testing. Because we could estimate a true denominator of those infected, the survey also allowed us to estimate accurate infection fatality rates by age, confirming that covid-19 was much more deadly than the flu.³ As vaccination rolled out in December 2020, the survey measured the rising proportion of the population with detectable antibodies across different age groups, and when those antibodies started waning.⁴

Beyond infection prevalence, the ONS survey contributed to our scientific understanding of immunity from prior infection, real world vaccine

effectiveness, and the vaccines' impact on transmission,⁵ which was not measured in clinical trials. As each new variant emerged, the world waited anxiously for the ONS survey's results on vaccine effectiveness, recognising its strength in avoiding the biases present in almost all other observational data. The study has also provided some of the most trusted estimates of long covid symptoms, since it can compare those with confirmed infections to a control group without.⁶

The only certainty is that new variants are coming

It is critical to keep the bones of our world leading data infrastructure, which was catalysed by covid, intact. While we may be learning to “live with the virus,” SARS-CoV-2 is far from done with us. With legal mandates for self-isolation and other protections ending, as well as the phasing out of free testing, a random sample survey like the ONS's can give us the “best view from the crow's nest” as the prime minister Boris Johnson recently put it—to avoid crashing into the next variant iceberg.

It is almost certain that there will be more variants, but anyone who is certain that the variants will be milder also has a bridge to sell you. Keeping this important surveillance in place can serve as an early warning sign without the need for mass population testing. While keeping our eyes glued to daily dashboards may be a pandemic pastime that has outlived its usefulness, covid-19 “weather” updates from ongoing surveillance can let people pack their umbrellas (or, in this case, masks) and adapt their behaviour to minimise the need for stricter mitigations.

Thinking bigger

It is likely that savings can be made in scaling back the frequency and size of the ONS infection survey, though large sample sizes that allow regional and demographic granularity are one of the study's strengths, so any changes should be strategically considered. Yet there is an argument to be made for thinking bigger and expanding the scope of the study to leverage the infrastructure for testing other common pathogens, such as flu or respiratory syncytial virus. Covid-19 has laid bare how appallingly little we know about the basic prevalence, transmission dynamics, and immune response to many common but serious infections. While the UK's 30 000 annual deaths from flu and pneumonia are dwarfed by what we've recently seen from covid-19,⁷ reducing this by even 10% from better surveillance

and scientific understanding would have knock-on effects for tens of thousands of GP visits and hospital admissions each year.

Again, knowledge of the ebbs and flows of other infectious diseases can help people take steps to protect themselves and their vulnerable loved ones. Thus, one positive legacy of the pandemic could be to increase our overall knowledge and capacity for infection control, lowering the burden of infectious disease much more broadly than for only covid-19. Such a study could also serve as a platform for generating the evidence base for preventive measures (especially if randomised) that was so sorely lacking at the beginning of this pandemic.

Creating a positive legacy for population health

Understanding the long term biological, social, and economic impacts of the pandemic will be a high scientific and policy priority for years, if not decades, to come. The data infrastructure we have built up can continue to provide gold standard estimates of these impacts. Younger children are particularly more likely to be asymptomatic and thus less likely to be tested. Understanding the potential long term health and developmental effects of infection on children and adolescents and how to mitigate this should be an important research agenda for covid going forward. From following people over time since the early stages of the pandemic, data from the ONS survey can tease out not just the impact of infection itself, but distinguish the impact of reinfection, infection before or after vaccination, infection with specific variants, etc.

Beyond the ONS infection survey, the UK has been a world leader in creating rapid and accessible data linkages, including to electronic health records and administrative records during the pandemic, partly through investments in the National Core Studies.⁸ While the current crisis poured much needed cash and talent into these massive efforts, maintaining the infrastructure for such linkages will provide tremendous value even in non-pandemic times, providing insights for other important diseases, such as cardiovascular disease and cancer. Keeping these data pipelines and processes robust rather than withering from neglect will pay ongoing dividends and keep us from having to start afresh in the next crisis.

Data have been power during the pandemic, but good data have been scarce. The UK is truly the envy of the world on this front, and we should remain good caretakers of our investments to promote population health and social and economic wellbeing for the long run.

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- 1 A survey like no other: Tracking the spread of COVID-19 in the general population. Statistically Speaking. The ONS Podcast. [Transcript]. 21 February 2022. <https://sites.libsyn.com/397223/a-survey-like-no-other-tracking-the-spread-of-covid-19-in-the-general-population>
- 2 Dean N. Tracking COVID-19 infections: time for change. *Nature* 2022;602:185. doi: 10.1038/d41586-022-00336-8. pmid: 35136224
- 3 Levin AT, Hanage WP, Owusu-Boaitey N, Cochran KB, Walsh SP, Meyerowitz-Katz G. Assessing the age specificity of infection fatality rates for COVID-19: systematic review, meta-analysis, and public policy implications. *Eur J Epidemiol* 2020;35:1123-38. doi: 10.1007/s10654-020-00698-1. pmid: 33289900
- 4 Wei J, Stoesser N, Matthews PC, et al COVID-19 Infection Survey team. Antibody responses to SARS-CoV-2 vaccines in 45,965 adults from the general population of the United Kingdom. *Nat Microbiol* 2021;6:1140-9. doi: 10.1038/s41564-021-00947-3. pmid: 34290390
- 5 House T, Pellis L, Pritchard E, et al. Total effect analysis of vaccination on household transmission in the Office for National Statistics COVID-19 infection survey. arXiv preprint. 14 July 2021. arXiv:2107.06545. <https://arxiv.org/abs/2107.06545>

- 6 Technical article: Updated estimates of the prevalence of post-acute symptoms among people with coronavirus (COVID-19) in the UK: 26 April 2020 to 1 August 2021. Office for National Statistics. 16 September 2021. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/articles/technicalarticleupdatedestimatesoftheprevalenceof-postacutesymptomsamongpeoplewithcoronaviruscovid19intheuk/26april2020to1august2021>
- 7 Influenza deaths in 2018, 2019 and 2020. Office for National Statistics. 24 February 2021. <https://www.ons.gov.uk/aboutus/transparencyandgovernance/freedomofinformationfoi/influenzadeathsin20182019and2020>
- 8 COVID-19 National Core Studies. Health Data Research UK. <https://www.hdr.uk/covid-19/covid-19-national-core-studies/>