Test, trace, and isolate in the UK

Gaps in adherence undermine effectiveness at every stage

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Test, trace, and isolate programmes are important interventions for the control of infectious disease epidemics, especially those associated with emerging pathogens. However, successful implementation of such a programme requires a series of coordinated efforts. Using data from 37 national online surveys, Smith and colleagues (doi:10.1136/bmj.n608) report the performance of the test, trace, and isolate system in the UK over the initial 11 months of the covid-19 pandemic.¹ The authors examined each major component of the programme and analysed the factors associated with gaps within each component.

What do the results of this study tell us about the implementation of the covid-19 test, trace, and isolate system in the UK? The simple math is revealing: 50% of respondents could identify the symptoms of covid-19, 20% would seek a test for covid-19 if they had symptoms, and 80% would share details of close contacts if they tested positive. Taken together, if respondents were a representative sample of people with symptoms, the contacts of only 8% (50%×20%×80%) of all people with symptoms of covid-19 would be identifiable and therefore eligible for subsequent isolation and quarantine efforts. Since the basic reproduction number of covid-19 is estimated to be between 2 and 3 or even higher, at least 50-66% of transmissions would need to be interrupted to bring the effective reproduction number below the critical threshold of 1.^{2,3} The persistent gaps in the UK's test, trace, and isolate system reported by Smith and colleagues suggest that the programme probably had only a limited impact on the pandemic in the UK.

The data gathered in this study, which reveal large gaps in both symptom recognition and willingness to test, suggest that investments in health communication to improve knowledge of symptoms and to reduce barriers to diagnostic testing could have been more effective than investments in training contact tracers. Context is important, however. The situation might be different outside the UK, and extrapolation is difficult.

A test, trace, and isolate programme that targets symptomatic covid-19 infections in the population has additional limitations when transmission from asymptomatic and pre-symptomatic infections occurs frequently. Studies of the transmission dynamics of covid-19 have shown that pre-symptomatic transmission accounts for a high proportion (up to 40%) of all transmissions.⁴⁻⁶ Furthermore, identification of close contacts must be followed by quarantine of those contacts—an additional potential gap that is not directly addressed in the linked analysis.

The true impact of a test, trace, and isolate programme is probably even lower than that suggested by Smith and colleagues' findings, given the extent of pre-symptomatic and asymptomatic transmission of covid-19 and the potential for attrition along the full cascade of test, trace, and isolate efforts. Ultimately, symptom based and case based interventions alone are highly unlikely to contain the covid-19 pandemic. A more realistic expectation is that an effective test, trace, and isolate programme can be one component of a more comprehensive strategy. Population based measures such as physical distancing, use of face masks, and possibly mass testing are needed to complement case based interventions to reduce the reproduction number to below unity—as has been observed in settings such as Singapore and Taiwan.

Even now, vaccines are not anticipated to bring life back to normal quickly, and concerns about vaccine safety⁷ and viral variants pose ongoing challenges for vaccination programmes globally. Combined use of vaccination, case based interventions, and population based interventions provide the best chance for sustained control of covid-19. The study by Smith and colleagues is an important reminder of the gaps and vulnerabilities associated with test, trace, and isolate programmes.

Looking ahead, innovative approaches, including digital contact tracing, promise to make more efficient use of resources and to improve the efficacy of test, trace, and isolate in a resource constrained public health system, but the on-the-ground effectiveness of such approaches has yet to be thoroughly evaluated.⁸

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