Flaws in the UK Covid-19 testing system

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INTRODUCTION

The ongoing spread of SARS-CoV-2, as well as the risk of future pandemics, make it imperative for countries to learn from one another, particularly around the organisation of testing systems. Results from a study of the national testing systems in six countries (hereafter referred to as 'the study countries.') reveals flaws in UK Coronavirus testing compared with other countries. The analysis uses the framework outlined by the UK's Independent Scientific Advisory Group for Emergencies - Find, Test, Trace, Isolate, Support ('FTTIS') - which presents five key components of a 'test and trace' system that is equipped to effectively control the spread of SARS-CoV-2. Study countries include Ireland, Germany, South Africa, South Korea Spain, and the UK.

Findings show considerable variation in FTTIS systems across countries, and suggest three lessons for control of SARS-CoV-2:

1. As no country has a fully optimised system, all study countries can benefit from sharing lessons.
2. For most countries, key areas of focus should be on maintaining isolation and quarantine of individuals and providing support measures to ensure adherence to guidelines and wellbeing.
3. A full FTTIS system requires an additional evaluation component to enable learning, to address the changing challenges of Covid-19 response and share best practice internationally.

FIND

Two parallel strategies need to be considered for a comprehensive FTTIS system. A passive strategy first ensures that those coming forward with Covid-19 symptoms can access diagnostic tests and have their contacts traced. However, the majority of those infected with SARS-CoV-2 will not display symptoms, or may infect others before symptoms develop. Therefore, an active strategy is also needed to hunt for asymptomatic individuals in carefully identified high-risk populations to reduce opportunities for SARS-CoV-2 to spread. Lack of medical oversight and test capacity hampers the effectiveness of these strategies in the UK.

Key findings

UK lessons

- Of the study countries, the UK has the highest proven test capacity with 12,985 tests recorded per week per million capita in July (and rising). However, this capacity is not being used efficiently.
- Coronavirus testing in the community in the UK is being delivered outside of the usual NHS structures, with access to testing and sample collection undertaken without the high levels of medical supervision seen in other countries.
- Unlike other studied countries, testing in the UK has been undertaken outside accredited laboratories with experience of clinical testing for infectious diseases, raising quality concerns.
- In the UK there appears to be no systematic follow-up of isolating or quarantining individuals, except for travellers returning from designated countries. This is against World Health Organisation (WHO) advice.
- Low levels of sick pay may not be enough to prevent the financially insecure from continuing to work, even when unwell. The daily maximum levels of sick pay for isolating employees in Germany are equivalent to the UK's weekly rate.

General lessons

- **Find**: Combining active and passive case-finding approaches, identifying high-risk groups and using effective, tailored communication strategies are all imperative.
- **Test**: The accuracy, utility, and reliability of tests depends on the procedures used for sample collection, handling, and processing. Leveraging existing laboratory networks enables rapid scale up of quality-assured tests.
- **Trace**: Centralised, decentralised and digital contact tracing may be complementary, with careful consideration of how data can be shared across the FTTIS systems while protecting privacy.
- **Isolate**: FTTIS systems should include some form of monitoring of individuals in isolation and quarantine to promote adherence to guidelines and wellbeing.
- **Support**: Offering practical, financial, and material support to individuals in isolation and quarantine promotes adherence and wellbeing.
- These components are interrelated and rely upon one another.
- Openness and evaluation are integral to the FTTIS system, to support continual assessment, learning, evolution and international sharing of good practice

TEST

While antibody testing and rapid or close-to-patient diagnostics are now emerging, molecular laboratory tests based on the polymerase chain reaction (PCR) technique have been the standard for managing Covid-19 in study countries. Many laboratories in hospitals, universities, government agencies and commercial organisations have shown the capability to develop and/or provide diagnostic testing capacity for SARS-CoV-2. The accuracy and utility of these tests depends greatly on the wider context of their use, including procedures for sample collection, sample handling, the robustness of testing processes, and the speed at which results are obtained and communicated.

Sample collection influences the reliability of test results, with the sample site (e.g. upper or lower respiratory tract) and the training of the individual collecting the sample having a marked impact on the sensitivity of the test itself. This means that it is difficult to rule out Covid-19 based solely on one negative test result. The UK is an outlier, focusing solely on upper respiratory sample collection in the context of its community testing programmes. Moreover, England's National Health Service (NHS) Test and Trace programme has relied heavily on self-collected samples from home collection kits, raising concerns around speed of testing and accuracy of results.

High standards of testing are essential. In most study countries, testing has been undertaken in accredited laboratories with experience of clinical testing for infectious diseases, overseen by a nominated laboratory. Notably in the UK, the commissioning of new, private, large scale testing in 'Lighthouse Laboratories' has bypassed accreditation and raises quality concerns. Although the UK has the highest testing capacity of the study countries, the above issues limit its efficient use.

TRACE

At the heart of an effective FTTIS system is the capability to rapidly identify and warn all contacts of infected individuals to take action to prevent the onward spread of disease, and to monitor these individuals' wellbeing and compliance. Study countries are using three approaches to contact tracing in their FTTIS systems. These are: decentralised (local), centralised, and digital contact tracing. Each of these three are potentially complementary. While digital technologies provide additional gains over manual methods alone, they raise data protection issues that require either avoiding data centralisation or the compromising of data privacy. Of the study countries, the UK (and England particularly) has been relatively slow to deploy digital measures.

ISOLATE

Those confirmed as infected with SARS-CoV-2 through a positive test result need to isolate until they are no longer a risk to the public. While fines, detention and jail terms are common enforcement measures in place across all the study countries, monitoring of those in isolation or quarantine varies substantially. There is a need not just for enforcement of isolation and quarantine but support for affected individuals to promote and enable compliance, rather than simply punishing non-compliance. UK health authorities should regularly contact those isolating, as the World Health Organisation recommends.

SUPPORT

Measures ranging from provision of guidance, and financial support, to food, drink and accommodation, may be needed to ensure socioeconomic stability and public confidence in a FTTIS system. Providing information to those in isolation or quarantine is routine in study countries. Guidance requires a multi-lingual, multi-modal approach with consistent messaging and media cooperation to ensure compliance.

Direct financial or material support varies widely between study countries. Moreover, many people in all study countries do not qualify for even these benefits. Thus, sick pay may not be enough to prevent the financially insecure from continuing to work, even when unwell. In many countries, it is also expected that those self-isolating will be supported by friends, family, or community groups. However, infection is most likely to be transmitted between individuals that live within the same household. Accommodation is provided to separate the infectious from other family members in some study countries, but not in the UK.

CONCLUSION

The findings allow a series of lessons to be drawn for each of the study countries. First, no single country has implemented a comprehensive and fully functioning FTTIS system that could not be improved, possibly using measures demonstrated in other study countries. A willingness to report data on each FTTIS system's performance at national and regional level would promote learning and improvement. Were each country to publish performance based on a standardised set of indicators (examples of which are suggested by the UK's Independent Scientific Advisory Group for Emergencies), best practice would be more easily identified, nationally and internationally. This capacity to evaluate system performances is required not just for post-pandemic lessons but to identify best practices during the pandemic. Given these lessons, both general and country-specific, there are opportunities immediately available to develop and improve testing systems to limit the spread of SARS-CoV-2.

FURTHER READING

Moon, Joshua and Chekar, CK and Barberá, David and Davey, Gail and Gaisser, Sibylle and Gaisser, Tobias and Iwuji, Collins and Meseguer, Enrique and Ryan, James G and Hopkins, Michael M., *Optimising 'Test and Trace' Systems: Early lessons from a comparative analysis of six countries* (September 17, 2020) Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3694441

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