



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Short Communication

Do members of the public think they should use lateral flow tests (LFT) or polymerase chain reaction (PCR) tests when they have COVID-19-like symptoms? The COVID-19 Rapid Survey of Adherence to Interventions and Responses study



L.E. Smith ^{a, b, *}, H.W.W. Potts ^c, R. Amlôt ^{b, d}, N.T. Fear ^{a, e}, S. Michie ^f, G.J. Rubin ^{a, b}

^a Psychological Medicine, King's College London, Institute of Psychiatry, Psychology and Neuroscience, Weston Education Centre, Cutcombe Road, London, SE5 9RJ, UK

^b NIHR Health Protection Research Unit in Emergency Preparedness and Response, King's College London, Weston Education Centre, Cutcombe Road, London, SE5 9RJ, UK

^c Institute of Health Informatics, University College London, Institute of Health Informatics, 222 Euston Road, London, NW1 2DA, UK

^d Behavioural Science and Insights Unit, Public Health England, Behavioural Science and Insights Unit, Porton Down, Salisbury, Wiltshire, SP4 0JG, UK

^e Academic Department of Military Mental Health, King's Centre for Military Health Research, London, UK

^f Centre for Behaviour Change, University College London, Centre for Behaviour Change, 1-19 Torrington Place, London, WC1E 7HB, UK

ARTICLE INFO

Article history:

Received 9 July 2021

Accepted 20 July 2021

Available online 28 July 2021

Keywords:

Antigen testing

Lateral flow devices

Testing

Behaviour

Knowledge

COVID-19

ABSTRACT

Objectives: This study aimed to investigate public use of lateral flow tests (LFT) and polymerase chain reaction (PCR) tests when experiencing key COVID-19 symptoms.

Study design: In this study, data from two waves of a cross-sectional nationally representative online survey (data collected 1 and 2 June, and 14 and 15 June 2021; $n = 3665$ adults aged ≥ 18 years living in England or Scotland) were used.

Methods: We report data investigating which type of test, if any, the public think Government guidance asks people to use if they have COVID-19 symptoms. In people with key COVID-19 symptoms (high temperature / fever; new, continuous cough; loss of sense of smell; loss of taste), we also describe the uptake of testing, if any.

Results: Ten percent of respondents thought Government guidance stated that they should take an LFT if symptomatic, whereas 18% of people thought that they should take a PCR test; 60% of people thought they should take both types of test (12% did not select either option). In people who were symptomatic, 32% reported taking a test to confirm whether they had COVID-19. Of these, 53% reported taking a PCR test and 44% reported taking an LFT.

Conclusions: Despite Government guidance stating that anyone with key COVID-19 symptoms should complete a PCR test, a significant percentage of the population use LFT tests when symptomatic. Communications should emphasise the superiority of, and need for, PCR tests in people with symptoms.

© 2021 The Authors. Published by Elsevier Ltd on behalf of The Royal Society for Public Health. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Since 18 May 2020, guidance in the United Kingdom has been that people with a new onset cough, high temperature, or loss of taste or smell should receive a polymerase chain reaction (PCR) test for COVID-19.¹ In addition, since 9 April 2021, everyone in the United Kingdom has been able to access free, rapid lateral flow tests (LFTs) for COVID-19 for use when asymptomatic.² In England and

Scotland, it is recommended that all adults should use an LFT twice a week, with any positive LFT results requiring a follow-up PCR test to confirm infection. Although the results of all LFTs conducted at home should be reported on a Government website, in practice, it is believed that most LFTs go unreported.³ How LFTs should be incorporated into efforts to combat the pandemic has been a source of controversy, with arguments played out across academic journals and the national media.^{4,5} Often missing from this debate are any data on how tests are used in practice. Many members of the public are uncertain as to the difference between PCR tests and LFTs

* Corresponding author. Department of Psychological Medicine, King's College London, Weston Education Centre, Cutcombe Road, London, SE5 9RJ, UK.

E-mail address: louise.e.smith@kcl.ac.uk (L.E. Smith).

and, despite warnings from the Government and NHS that people should ‘... not use a rapid lateral flow test if you have COVID-19 symptoms. Get a PCR test and self-isolate’,⁶ it is clear that some people do indeed use LFTs to check their symptoms.

To assess current public usage of tests, we analysed data from the CORSAIR study (COVID-19 Rapid Survey of Adherence to Interventions and Responses study). This is a series of nationally representative (UK) cross-sectional surveys, conducted by BMG data on behalf of the Department of Health and Social Care.⁷ This work was conducted as part of service evaluation of the marketing and communications run by the Department of Health and Social Care and, following advice from King’s College London Research Ethics Subcommittee, was exempt from ethical approval. For this study, we used a sample of 3665 adults aged ≥18 years living in England or Scotland from two survey waves, collected 1 and 2 June, and 14 and 15 June 2021.

Participants were asked what they thought Government advice was if they had symptoms of COVID-19 (true/false statements). Only 17.8% of people selected that they should take a PCR test, 10.0% thought they should take an LFT, and 60.0% thought they should take both types of test (Table 1). Twelve percent of people did not select either option.

Among people who reported that they had developed a new, continuous cough, high temperature / fever, or loss of sense of smell or taste in the last 10 days ($n = 185$), 31.9% (95% confidence interval [CI] 25.1%–38.7%, $n = 59$) reported taking a test to confirm whether they had COVID-19. Of those, 52.5% (95% CI 39.4%–65.7%, $n = 31/59$) reported taking a PCR test, and 44.1% (95% CI 31.0%–57.1%, $n = 26/59$) reported taking an LFT. Two people did not know what type of test they took. We did not include a ‘both’ option for this item.

Our findings suggest that intended and actual testing behaviours in the public are out of step with Government recommendations. Our previous work has suggested that only 20% of people with COVID-19-like symptoms requested a test for COVID-19 in the United Kingdom,⁷ although among those who have reason to believe they have been exposed to infection, this percentage is likely to be higher.⁸ The easy accessibility of LFTs, 30 min turn-around time, and lack of compulsion to formally register the test with the Government (and hence self-isolate if the result is positive) probably make LFTs a more attractive option than PCR for some people. What the net effect of this is on rates of transmission is unclear. If LFTs are used instead of PCR by symptomatic people who would otherwise have requested a PCR test, their lower sensitivity reduces the chances of an accurate diagnosis.⁴ On the other hand, if LFTs are used by people who would not otherwise have sought a test, and a positive result leads to a reduction in behaviours associated with transmission, then this would be a beneficial outcome. The use of an LFT among symptomatic people who have already requested a PCR test is unclear. At present, adherence to self-isolation among people who seek a PCR test tends to be weakest in the period between symptom onset and receiving a test result.⁹ If a positive LFT result during this period encourages more people to self-isolate, this may reduce transmission.

Conversely, a false-negative result at this point may reduce adherence in some, offsetting this impact, although the findings from elsewhere suggest reduced adherence as a result of false reassurance is relatively uncommon.¹⁰

Modelling is required to quantify the impact of testing behaviours. Until then, good communication with the public emphasising the superiority of PCR tests when symptomatic remains important.

Author statements

Ethical approval

This work was conducted as part of service evaluation of the marketing and communications run by the Department of Health and Social Care and, following advice from King’s College London Research Ethics Subcommittee, was exempt from ethical approval.

Funding

This work was funded by the National Institute for Health Research (NIHR) Health Services and Delivery Research programme. Surveys were commissioned and funded by the Department of Health and Social Care (DHSC), with the authors providing advice on the question design and selection. L.S., R.A., and G.J.R. are supported by the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Emergency Preparedness and Response, a partnership between Public Health England, King’s College London, and the University of East Anglia. R.A. is also supported by the NIHR HPRU in Behavioural Science and Evaluation, a partnership between Public Health England and the University of Bristol. HWWP receives funding from Public Health England and NHS England. NTF is partly funded by a grant from the UK Ministry of Defence. The views expressed are those of the authors and not necessarily those of the NIHR, Public Health England, the Department of Health and Social Care or the Ministry of Defence.

Role of the funding source

NIHR and DHSC had no role in analysis, decision to publish, or preparation of the article. Preliminary results were made available to DHSC and the UK’s Scientific Advisory Group for Emergencies.

Competing of interests

All authors had financial support from NIHR for the submitted work. R.A. is an employee of Public Health England; HWWP receives additional salary support from Public Health England and NHS England; NTF is a participant of an independent group advising NHS Digital on the release of patient data. All authors are participants of the UK’s Scientific Advisory Group for Emergencies or its subgroups. There are no other financial relationships with any organisations that might have an interest in the submitted work in

Table 1
Understanding of Government guidance on testing if you have symptoms of COVID-19.

The Government has issued advice on how people should help prevent the spread of coronavirus if they have symptoms. If you have symptoms of coronavirus, you: (total $n = 3665$)	Selected ‘true’, % (95% CI)	N
Should take a rapid ‘lateral flow’ coronavirus test (results within 30 min)	10.0 (9.1–11.0)	368
Should take a lab-processed ‘PCR’ coronavirus test (results typically within a day or two)	17.8 (16.5–19.0)	651
Selected both options	60.0 (58.4–61.6)	2200
Selected neither option	12.2 (11.1–13.2)	446

the previous 3 years and no other relationships or activities that could appear to have influenced the submitted work.

Authors' contributions

All authors conceptualised the study and contributed to survey materials. L.S. completed analyses, and analyses have been verified by H.W.W.P. L.S. wrote the first draft of the article. All authors contributed to, and approved, the final manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

References

1. Department of Health and Social Care. *Everyone in the United Kingdom with symptoms now eligible for coronavirus tests*. 2020.
2. Department of Health and Social Care. *New campaign urges public to get tested twice a week*. 9 April 2021. 2021. <https://www.gov.uk/government/news/new-campaign-urges-public-to-get-tested-twice-a-week>. [Accessed 14 June 2021].
3. National Audit Office. *Test and trace in England – progress update*. 2021.
4. Dinnes J, Deeks JJ, Berhane S, et al. Rapid, point-of-care antigen and molecular-based tests for diagnosis of SARS-CoV-2 infection. *Cochrane Database Syst Rev* 2021;**3**.
5. Halliday Josh. Covid-19: how accurate are lateral flow tests? *Guardian* April 2021;**25**.
6. Gov.Uk. *Order coronavirus (COVID-19) rapid lateral flow tests*. 2021. <https://www.gov.uk/order-coronavirus-rapid-lateral-flow-tests>. [Accessed 25 June 2021].
7. Smith LE, Potts HWW, Amlôt R, Fear NT, Michie S, Rubin GJ. Adherence to the test, trace, and isolate system in the UK: results from 37 nationally representative surveys. *BMJ* 2021;**372**:n608.
8. Mowbray F, Woodland L, Smith LE, Amlôt R, Rubin GJ. Is my cough a cold or covid? A qualitative study of COVID-19 symptom recognition and attitudes towards testing in the UK. *medRxiv* 2021. 2021.05.28.21258022.
9. Office for National Statistics. *Coronavirus and self-isolation after testing positive in England: 10 May to 15 May 2021*, vol. 2021; 2 June 2021. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandselfisolationaftertestingpositiveinengland/10mayto15may2021>. [Accessed 25 June 2021].
10. Martin AF, Denford S, Love N, et al. Engagement with daily testing instead of self-isolating in contacts of confirmed cases of SARS-CoV-2. *medRxiv* 2021. 2021.03.13.21253500.