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.

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Letter to the Editor

Table 1
Demographics of respondents to a qualitative survey on SARS-CoV-2 lateral flow self-testing as part of a nationwide programme.

Role	No.	%	Age	No.	%
Medical/Surgical	236	10	**<20**	27	1
Nursing/ Midwifery	834	35	**20–29**	280	12
Allied Health Professionals	159	7	**30–39**	413	18
Healthcare Support Staff	195	8	**40–49**	586	26
Admin/Clerical/Management	322	13	**50–59**	701	31
Pharmacy	63	3	**60+**	287	12
Auxiliary	40	2			
Laboratory	11	1			
Other	509	21			

Healthcare worker perceptions of routine asymptomatic SARS-CoV-2 screening using lateral flow assays: A qualitative analysis across two London hospitals.

Lamb et al. [1] and Downs et al. [2] have separately confirmed that regular SARS-CoV-2 lateral flow antigen screening amongst healthcare workers (HCW) demonstrates high positive-predictive value, but few studies have examined user acceptability. To investigate the impact of twice-weekly self-administered nasopharyngeal sampling and LFA testing for SARS-CoV-2, we undertook an end user survey amongst healthcare staff participating in this screening programme across two London hospitals.

All 6460 staff across two London hospitals (Chelsea & Westminster Hospital and West Middlesex Hospital) are invited to participate in twice weekly SARS-CoV-2 lateral flow testing as part of a national HCW programme.[3] All staff undertaking screening record results via an online platform. Over a two-month period (2nd March 2021 to 2nd May 2021) we attached a survey (supplementary file 1, including methods) on user experience.

Of 6460 staff, 2800 regularly performed twice weekly LFA testing for COVID-19 during the study period, and 2370 (84.6%) attempted the survey. Average responses for each single-best-answer question were 1965/2370 (82.9% of respondents), and for white space answers 544/2370 (23% of respondents). Respondents represented a broad range of staff roles and ages (Table 1).

LFA ease of use

The majority of respondents (88.5%; 1876/2119) attempted an LFA, of which 93.7% (1867/1992) were successful. Instructions were deemed easy to understand for swabbing (96%; 1913/1993), mixing the sample with buffer (97.1%; 1909/1964), and cartridge inoculation (94.2%; 1869/1984). 98.2% (1902/1937) performed the LFA without assistance, and 97.6% (1847/1893) preferred performing it themselves rather than an HCW (1.6%; 39/1893) or trained non-HCW (0.4%; 7/1893) doing this. When asked what was appealing about the LFA, HCWs particularly focused on convenience; "*you can do it at a time that is convenient. There is no way with our current caseload demand we could attend an appointment in work time*", "*I have a routine, and I incorporate it into my day's activities in the comfort of my home*".

Interpreting LFA results

92.5% (1801/1948) of staff felt able to interpret their results, and 93.4% (1826/1954) had confidence they were accurate and reliable. Two major themes fuelled this confidence; (i) personal/collegiate experiences of LFA confirmation by reverse transcriptase polymerase chain reaction, and (ii) confidence in the system in place around the LFA programme: "*I trust the NHS*", "*our trust wouldn't recommend a test that doesn't work*" and "*the test is provided by a government program so it should be safe*". Only 6.6% (128/1954) of respondents were not confident in the LFA, based on prior experience: "*I had COVID and the test came back as negative before I had a PCR test*".

Sampling comfort

Despite 60.1% (1187/1976) of respondents reporting the procedure 'fairly uncomfortable' or 'very uncomfortable', 94.5% (1829/1935) would continue the twice weekly LFA testing process during the pandemic. Respondents felt "*it is a negligible inconvenience if it helps save lives and livelihoods*". An additional theme that caused concern was the environmental impact of "*the plastic waste generated from all the packaging*" and "*creating more waste that will end up in the ocean*".

Many of our Trust staff have undergone blood antibody prevalence testing using LFAs.[4] The survey mooted the theoretical option of a finger prick test for SARS-CoV-2 antigen. Only 32.3% (575/1776) of respondents found this theoretical method preferable, citing it "*too invasive*" and "*too painful to do twice weekly*", but many added "*if it were more accurate, I would consider it*".

Self-perceived behavior change

41.1% (717/1743) reported that there was no change in their behaviour as a result of LFA testing, while 41.8% (728/1743) felt safer. 8.5% (148/1743) felt more comfortable interacting with their household, and 6.8% (118/1743) felt more comfortable amongst vulnerable family members. Only 3/1743 (0.17%) respondents changed their PPE usage based on their LFA results. The perceived impact of the program was overwhelmingly focused on reducing transmission to others rather than personal gain; "*I feel safe seeing my elderly/vulnerable patients*", "*I work with very vulnerable children, so it put my mind at rest I wasn't potentially spreading to them*", "*Assures me I'm not a silent spreader, keeps my family safe and I know if I need further testing and/or to isolate*". A minority of staff (1.5%;

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11/740) reported use of LFAs (rather than PCR) when experiencing COVID-19 symptoms in breach of guidance.

We find 2800/6460 (43.3%) of staff at a multi-site London NHS Trust regularly report twice weekly LFA testing for SARS-CoV-2 antigen, and 94.5% would continue throughout the pandemic if given the opportunity. Technically almost all HCWs have no problem with LFAs but only three-quarters have confidence in reading, and in the accuracy of, LFAs. Only half of respondents find nasopharyngeal sampling comfortable, yet HCWs are still keen to concord to reduce transmission. We find self-reported increased feelings of safety amongst HCWs participating in the screening programme, yet we also find off-protocol use of the LFAs for symptomatic self-testing (in lieu of PCR based tests). Our respondents were representative of UK HCW populations in age and staffing groups, and while we use the Innova antigen LFA, the majority of assays follow a similar testing procedure.

Our study has limitations, including the number of staff who did not elect to take part in the testing program (i.e., the respondent cohort were those who were already participating in the screening programme). Examining the barriers to this uptake must be urgently undertaken so adjustments may be made to increase participation.

While correlations may be attempted between our results and experience of the general public, it is important to recognise 63% of our respondents have undergone clinical training, while non-clinical staff may have regular contact with clinical colleagues (5–7). This may increase knowledge and understanding testing and the basis behind the screening program.

In conclusion, HCWs are keen to know their real-time COVID-19 status and take part in available risk reduction strategies. They place significant trust on their employer and national bodies to ensure that testing platforms have undergone rigorous selection processes. Widespread testing amongst hospital staff did not significantly alter PPE usage, but provided reassurance for staff when moving between work and household environments.

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Declaration of Competing Interest

JH received research funding from CW+ Charity and the Westminster Medical School Research Trust and received honoraria from Gilead (2020). SJCP has received a research grant from the Scientific Exploration Society/Viscount Gough, outside the submitted work. NM has received speaker fees from Beyer (2016) and Pfizer (2019–2021) and received educational support from Eumedica (2016) and Baxter (2017). LSPM has consulted for or received speaker fees from bioMerieux (2013–2021), Pfizer (2018–2021), Eumedica (2016–2021), DNAelectronics (2015–18), Dairy Crest (2017–2018), Umovis Lab (2020–2021), Shionogi (2021), Kent Pharma (2021), and Pulmocide (2021), and received research grants from the National Institute for Health Research (2013–2019), CW+ Charity (2018–2021) and LifeArc (2020–2021). RJ has received honoraria, speaker fees, travel support and/or research grant funding from Gilead, ViiV Healthcare, BMS, Abbvie, Janssen and Merck. All other authors have no competing interests to declare.

Authors' contributions

All listed authors made substantial contributions to the conception or design of the work; or to the acquisition and analysis of data for the work; and drafting the work or revising it critically ahead of submission for publication. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Ethical approval

This evaluation was commissioned as a service evaluation by the COVID Testing Committee of Chelsea & Westminster NHS Foundation Trust, on 12 January 2021. Aggregated data was analysed under the Health Service Control of Patient Information Regulations (2002) general notice that patient data for a COVID-19 purposes may be used for research as stated by the UK Secretary of State for Health and Social Care.

Data availability

The data analysed during the current study are available from the corresponding author (JH; j.heskin@nhs.net) on reasonable request, as long as this meets local ethical and research governance criteria

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jinf.2021.10.023.

CRediT authorship contribution statement

Joseph Heskin: Data curation, Formal analysis, Investigation, Writing – original draft. **Scott J.C. Pallett:** Methodology, Data curation, Writing – review & editing. **Nabeela Mughal:** Conceptualization, Supervision. **Rachael Jones:** Conceptualization, Writing – review & editing. **Michael Rayment:** Conceptualization, Data curation, Writing – review & editing. **Gary W. Davies:** Conceptualization, Supervision, Project administration, Writing – review & editing. **Luke S.P. Moore:** Conceptualization, Supervision, Writing – review & editing, Project administration.

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