




# BMJ Open Perspectives of attenders and non-attenders to SARS-CoV-2 asymptomatic community testing in England: a qualitative interview study

Leah Jayes <sup>1</sup>, Ilze Bogdanovica,<sup>1</sup> Emily Johnston,<sup>2</sup> Kaushik Chattopadhyay <sup>1</sup>, Joanne R Morling <sup>1</sup>, Shirley Devine,<sup>3</sup> Nicola Richmond,<sup>3</sup> Tessa Langley<sup>1</sup>

**To cite:** Jayes L, Bogdanovica I, Johnston E, *et al*. Perspectives of attenders and non-attenders to SARS-CoV-2 asymptomatic community testing in England: a qualitative interview study. *BMJ Open* 2022;**12**:e064542. doi:10.1136/bmjopen-2022-064542

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2022-064542>).

Received 10 May 2022

Accepted 26 August 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

<sup>1</sup>Lifespan and Population Health, School of Medicine, University of Nottingham, Nottingham, UK

<sup>2</sup>Department of Psychology, Sociology & Politics, Sheffield Hallam University, Sheffield, UK

<sup>3</sup>Derbyshire County Council, Matlock, UK

## Correspondence to

Dr Leah Jayes;  
leah.jayes@nottingham.ac.uk

## ABSTRACT

**Objectives** In December 2020, Derbyshire County Council in England introduced ‘walk-in’ asymptomatic community COVID-19 testing sites. Our study aimed to explore people’s views of the newly established COVID-19 community testing (CT) sites among those who attended and those who did not attend them, alongside gathering individuals’ experiences of attending a CT site to complete a lateral flow test.

**Setting** This qualitative research study comprised of one-to-one interviews with those attending a COVID-19 CT sites in Derbyshire and those from the surrounding area who did not attend.

**Participants** A combination of purposive and convenience sampling was used to recruit those who had (n=18) and those who had not attended (n=15) a walk-in asymptomatic CT site.

**Results** Employers played a key role in raising awareness of the testing sites, with most attending CT at the request of their workplace. The experience of attending a CT site was overwhelmingly positive and those who got tested spoke about the reassurance a negative result offered, knowing they were not passing on the virus when going about their daily lives. However, there was a perception that awareness of CT sites was low across the county and some confusion about who was eligible to attend and under what circumstances. Individuals linked this to low level of advertising they had seen, in addition to a lack of clarity in the information provided.

**Conclusions** People’s experience of attending a ‘walk-in’ asymptomatic CT site in Derbyshire was generally very positive; however, ensuring clear communication for future testing programmes is essential to maximise their uptake.

## INTRODUCTION

It is estimated that around one in five people with SARS-CoV-2 (COVID-19) do not display any symptoms,<sup>1</sup> however this could be as high as 45%.<sup>2</sup> In addition, infected individuals may be infectious prior to developing symptoms (known as presymptomatic infection)<sup>3</sup> and these individuals may still be able to transmit the virus<sup>1</sup> for around 12 days before displaying symptoms.<sup>4 5</sup> Evidence suggests

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ There has been a limited number of studies exploring views to community testing (CT) among the general population; this study included both those who had and had not attended the service.
- ⇒ One-to-one interviews enabled researchers to explore participant views in depth relating to strengths and limitations of the service and facilitators and barriers to access.
- ⇒ This study was completed in one county in England and therefore findings may not be transferable to other areas.
- ⇒ Variation in the views outlined by attenders and non-attenders may have been influenced by the fact that non-attenders were recruited roughly 2 months after attenders, by which point the UK government COVID-19 restrictions had become slightly more relaxed and they had started to offer free lateral flow test kits to use at home.
- ⇒ All those who attended CT subsequently tested negative for COVID-19 and therefore we were not able to explore any implications of a positive test result.

that asymptomatic transmission has been a core factor in a number of outbreaks—in workplaces, social gatherings and transport hubs.<sup>6–9</sup> Large-scale asymptomatic COVID-19 community testing (CT) aims to identify people with COVID-19 displaying no symptoms, thus contributing to a reduction in the spread of the virus through earlier and increased detection, however is reliant on individuals to both be tested and then to isolate if infectious. This type of screening involves frequent testing of large sections of the population, particularly those in the community in high contact settings such as schools and workplaces.<sup>10</sup> Two testing approaches have been used in the UK: rapid antigen test using Lateral Flow Test (LFT) and Polymerase Chain Reaction (PCR) test. While PCR tests are considered to be a gold

standard for detection of COVID-19, LFTs are offered as a cheaper and quicker alternative for population-wide testing.<sup>11</sup> In the UK, Liverpool was the first area to pilot large-scale CT. Between November 2020 and April 2021, 57% of Liverpool residents took an LFT.<sup>12</sup> The testing programme is estimated to have led to an 18% increase in case detection and 21% reduction in cases up to mid-December 2020. Uptake was lower in deprived areas, with loss of income identified as a key barrier to attend.<sup>12</sup>

Derbyshire is a county in the East Midlands region of England with a population of around 800 000.<sup>13</sup> In December 2020, Derbyshire County Council was one of the small number of authorities nationally to launch community COVID-19 testing as part of a Department of Health and Social Care programme to roll out LFT for COVID-19 among people without symptoms. Derbyshire's goal was to reduce the spread of the virus, protect the most vulnerable and drive down the infection rate across the county. Derbyshire piloted two testing models: open access 'walk-in' community sites for the general public and a workplace-focused site located on an industrial estate that operated on booked timeslots for employees. This study focuses on the evaluation of the open access model which was offered on four testing sites across the county. The programme initially aimed to replicate and build on learning from Liverpool and was subsequently modified to focus mainly on individuals required to leave their homes for work.

The pilot scheme involved a rapid phased roll out of sites across four districts over two months. Open access testing sites were based in community venues (eg, village halls and leisure centres). Sites were operated on a walk-in basis and were open seven days a week for an average of ten hours. Tests were analysed on site and results communicated within 30–60 min of the test. Just over 48 000 LFTs were recorded between 21 December 2020 and 24 March 2021. The pilot identified 618 positive COVID-19 cases through LFTs.<sup>14</sup>

Few studies have explored people's perceptions of COVID-19 CT and the barriers and facilitators to accessing testing. The aim of this qualitative study was to explore people's views of the newly established COVID-19 CT sites among those who attended and those who did not attend them, alongside gathering individuals' experiences of attending a CT site.

### Study context: overview of COVID-19 pandemic in England and Derbyshire

On 5 January 2021, England entered its third national lockdown due to increasing COVID-19 rates. People were required to stay at home, limit social contact, move education to remote learning and all non-essential retail were closed. On 8 March 2021, restrictions began to slowly lift in line with the government's COVID-19 'roadmap' out of lockdown.<sup>15</sup>

The national vaccination programme in England began on 8 December 2020. At the time of the first study interview in February 2021, around 25% of adults

in Derbyshire had received their first vaccination dose; this number had risen to nearly 60% by the time the final interview took place at the start of May 2021.<sup>16</sup>

## METHODS

A qualitative interview study was carried out with two groups: those who had attended a CT site ('attenders') and those who had not attended one ('non-attenders'). This paper follows the Standards for Reporting Qualitative Research guidelines (online supplemental file 1).

### Interview schedule

Two semi-structured interview guides were developed, one for the group of attenders and another for non-attenders (online supplemental file 2). Both included open-ended questions to explore understanding of and perceptions around CT alongside barriers or facilitators to attend. In addition, interviews completed with attenders explored their experience of attending a testing site. At the start of all interviews, participants were asked a short set of demographic questions. Due to time constraints, the first few interviews served as pilot interviews; data gathered from these pilot interviews is included in the main analysis.

### Participant recruitment and data collection

Attenders were recruited from two of the four open access 'walk-in' asymptomatic COVID-19 CT sites which initially ran for around six weeks in early 2021. One researcher (LJ) visited both sites on three occasions (to include weekdays and weekends) between February and March 2021. Once people had completed an LFT at the site, the researcher approached to advise them of the study and if interested provided potential participants with an information sheet and collected contact details. One site had the option to complete an interview in a nearby private room (adhering to COVID-19 guidelines), however most participants choose to complete an interview over the telephone which was arranged at their convenience.

To recruit Derbyshire residents who had never attended a CT site, adverts were placed in bulletins for regional voluntary organisations and distribution lists for Derbyshire County Council between March and April 2021. Those interested in the study were advised to contact the researcher who then provided potential participants with an information sheet and answered any questions. If happy to participate, a telephone interview was arranged at a convenient time for the participant.

Verbal consent was sought from all participants prior to completing an interview and a £10 shopping voucher was provided to participants. Interviews continued until data saturation was reached for each group of participants—that is, when no new information emerged from the data.<sup>17</sup> One researcher (LJ) completed 33 interviews between February and May 2021 which lasted between 12 and 52 min (average 27 min). All interviews were undertaken in English.

## Data analysis

Interviews were digitally audio-recorded, assigned a unique code and then transcribed verbatim by a University of Nottingham approved external transcription company who signed a non-disclosure agreement. Following receipt of the transcripts, they were checked and de-identified prior to uploading and managing in NVivo (V.12). Attender and non-attender transcripts were analysed together using inductive thematic analysis, an approach that allows coding and theme development to be directed by the content of the data.<sup>18</sup> Two researchers (LJ and EJ) independently familiarised and carried out line-by-line coding of a sample of transcripts before meeting to discuss initial codes and potential groupings of codes into themes. This step was then repeated with a further set of transcripts resulting in both researchers meeting again to discuss and agreed on a set of themes, resulting in a coding manual. This consensus-based approach aimed to minimise as much as possible individual biases.<sup>19</sup> Both researchers then coded the remaining transcripts using

the agreed coding manual, identifying any data that deviated from it which was then discussed. Although researchers (LJ and EJ) had some minor disagreements on where codes were placed within the coding manual, consensus was reached through discussion and as a result there was no need to consult with a third researcher. Writing up the thematic analysis in this paper helped to finalise the four themes generated and supported the development of the thematic map (online supplemental file 3).

## Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans for our research.

## RESULTS

In total, 18 interviews were completed with attenders (9 each from the two testing sites) and 15 with non-attenders.

**Table 1** Characteristics of all interview participants, broken down by attenders and non-attenders

	All participants (n=33)	Attenders (n=18)	Non-attenders (n=15)
Participant gender			
Female, n (%)	23 (70%)	11 (61%)	12 (80%)
Participant age (years)			
Mean	49	44	55
Median	38	45	55.5
IQR	22	21.25	23
Range	22–76	22–68	27–76
Ethnic background			
White British, n (%)	30 (91%)	15 (83%)	15 (100%)
Employment			
Paid employment, n (%)	24 (73%)	15 (83%)	9 (60%)
Paid employment—on furlough, n (%)	2 (6%)	2 (11)	0 (0%)
Voluntary worker, n (%)	1 (3%)	0 (0%)	1 (7%)
Retired, n (%)	6 (18%)	1 (6%)	5 (33%)
Of those in paid employment (n=24), leave home to work			
Yes, n (%)	16 (67%)	12 (80%)	4 (44%)
Keyworker* (self-defined)			
Yes, n (%)	15 (45%)	10 (56%)	5 (33%)
COVID-19 vaccination			
At time of interview had received at least one vaccination dose, n (%)	21 (64%)	7 (39%)	14 (93%)
Attenders only: frequency of CT site visits			
Those who were visiting a CT site for the first time		10 (55.5%)	
Of those who had visited a CT site more than once, median number of visits (range)		3 (2–5)	
*A 'key worker' is a public sector or private sector employee who is considered to provide an 'essential service' during the COVID-19 pandemic. <sup>29</sup>			
CT, community testing.			

Across the whole sample, the majority of participants were female and White British. Nearly twice as many left home to go to work in the attenders group compared with the non-attenders group and at the time of interview nearly all non-attenders had received their first COVID-19 vaccination compared with less than half of the attenders. Participant characteristics are summarised in [table 1](#).

Four interrelated themes are presented below. Illustrative quotes for each theme are provided in the figures alongside participant characteristics: attender (A) or non-attender (NA) followed by unique ID number, Male (M) or Female (F), and age in years.

### Theme 1. Awareness and understanding of CT

This theme was derived from information across the whole dataset and outlines varying levels of awareness and understanding relating to asymptomatic COVID-19 CT sites.

#### Awareness

Apart from three participants, all had heard about COVID-19 CT sites set up within the county prior to completing an interview. Around half of those interviewed were initially made aware of local CT while at work, either via email or being informed by their boss or a colleague. Others heard about CT through a friend or family member, Facebook post or adverts, local news (television or radio), through regional newsletters (subscription only) or by searching online for CT or LFT. Outside of this, only a few people recollected seeing any subsequent promotion or re-advertising of CT sites ([figure 1](#); 1a). In terms of any other criteria to attend CT sites, many were under the impression that you had to live in the area of the CT site to attend and a few thought they were just for people who worked in the community or were ‘key workers’ (1b).

#### Understanding

Most participants understood (either through word of mouth or promotional materials) that CT sites were specifically for those without COVID-19 symptoms to get tested in order to detect those in the community carrying

1a. *It was actually word of mouth, people, well colleagues who I work with came down with COVID 19 and they'd previously gone there without any symptoms, they were asymptomatic, gone there without any symptoms and it was just word of mouth really and then it was advertised in the local press and on social media [A02, F, 51 years]*

1b. *My understanding is that each general locality has had a community testing centre developed over the past months, with the primary aim as I understand it, of enabling people who are in employment, who wish to have a community test and I understand that you can have that done up to three times a week, with no appointment and with showing no symptoms but purely wanting to stay safe for you and the community [NA25, F, 62 years]*

1c. *I don't understand why you'd go if you hadn't got symptoms. Does that sound a bit silly?.....I spoke to my daughter about it, but I've also seen that on the news and on television, and I just, in my own mind, thinking, well, why would you go to a centre to test for something that you didn't think you hadn't got?...why would I go? I mean, I wouldn't go to the doctors and sit there and say, "I haven't got any symptoms" [NA21, F, 73 years]*

**Figure 1** Awareness and understanding of community testing.

COVID-19 asymptotically and that, in turn, this type of testing would limit the spread of the virus. Some went on to add that CT was particularly useful for those working in the community and that the sites would support COVID-19 restrictions being lifted sooner. Some people spoke about how they were initially or still confused about why asymptomatic testing facilities had been set up and why an individual would choose to get tested (1c). As mentioned at the start of this theme, three participants (all non-attenders) were completely unaware of the regional CT facilities; in these instances, the interviewer provided a brief overview of the CT sites running in their area before continuing with the interview.

### Theme 2. Reasons for and the positive experience of attending a CT site

All views outlined in this theme are derived from interviewees who had recently attended a CT site.

#### Reasons for attending

Over half of those attending a CT site were doing so initially at the request of their workplace; all left home to go to work with the public and/or other employees. For some, proof of a negative LFT had become mandatory in order for them to continue to work due to a change in shift patterns, because someone within their workplace (or a relative of an employee) had tested positive for COVID-19 or their employer had started to request routine negative test for all staff ([figure 2](#); 2a). Some participants said they simply attended out of interest or because they were in the vicinity and knew that a CT site was nearby. A few people said they had vulnerable family members, who they either lived with or needed to visit, therefore being tested was important in confirming they were not passing the virus on.

All participants highlighted the importance of attending CT for their own safety and to ensure they were not unknowingly spreading COVID-19 to the general public, colleagues or their own household. Nearly everyone spoke about how testing offered them reassurance or ‘peace of mind’ to continue with their current (although, often limited) day to day activities (2b). In instances where someone at work (or a relative of someone at work) had tested positive for COVID-19, people also said how vital CT was in permitting workplaces to continue to operate (once everyone tested negative), as opposed to all employees having to immediately self-isolate.

#### Experience of attending a CT site

Participants considered CT sites to be in good, easy to reach locations and liked the ‘drop-in’ nature of the sites. For most, the experience of attending was exactly what they had expected or exceeded their expectations. People attributed their positive experience of attending to different aspects: feeling safe in terms of COVID-19 restrictions being in place and adhered to, good organisation, clear directions throughout the site (2c), helpful and professional staff members at each point of the



- 2a. They've [employer] basically said to us that if we were found to be positive and we hadn't been testing twice a week, then our pay would be affected and all things like that [A17, F, 35 years]
- 2b. But just kind of peace of mind that I hadn't got it and that if I wanted to meet up with a friend and go for a walk I could do that. When I'm next going to the supermarket, I know that I'm alright to be at the supermarket, just those kind of things [A07, F, 26 years]
- 2c. Yeah, well I parked in the carpark, this gentleman told me which way to go, he come up to me and says, "What are you here for?" and I says what kind of test I'm after. He took me to the building, walked me inside, I met another gentleman who, I took a picture of a QR code to log in to gov.uk, give all me details, fill all that in and then got forwarded to another desk to give a couple more details and then go to a booth and have my test [A13, M, 30 years]
- 2d. I think it's absolutely bang on, like in and out within 10 minutes, you're not waiting outside in the cold, you get your details taken down, well twice over and yeah, it's pretty straightforward I think, I think it's a pretty good layout [A04, M, 22 years]
- 2e. I cannot say one bad thing about any of the experience both times at all, nothing bad about any of them at all...everything was just spot on...they were really nice people, honestly lovely people, I cannot say a bad word about any of it! [A05, F, 50 years]

**Figure 2** Reasons for and experience of attending a community testing site.

testing facility and the efficient and quick service (2d). People were surprised that they had not experienced any queues at the sites and by the speed of the process; most estimated they were in the CT site for just 10–15 min and received the result around 30–40 min after leaving (2d).

People had nothing but praise for the staff working at the sites. Many spoke about how pleasant, kind and informative they were. It was felt that the instructions received from staff members on how to complete an LFT were clear, enabling them to complete a test quickly and easily. For some, taking the LFT was not pleasant and on occasion made people gag. This aside, all concluded that taking the test was in fact 'fine' or 'not too bad'. Everyone interviewed disclosed that all previous LFT test results (completed at CT sites) were negative. When questioned about any improvements to the testing facilities, it was agreed that the service should continue and stay exactly as it is (2e).

### Theme 3. Reasons for not attending CT: personal and perceived

#### Reasons for not attending CT: personal

This subtheme explores people's personal reasons for having not attended a CT site. Views for this subtheme are only derived from the non-attender participants.

People did not attend CT because they deemed the site not local enough to them as they were under the impression that they had to live within the testing site vicinity to attend (previously mentioned under theme 1) (figure 3; 3a). Also highlighted in this earlier theme, some thought they were not allowed to attend because they did not work in the community or were not a 'key worker'. A few people outlined how they rarely came into contact with others or went out in the community so felt getting tested was of little value (3b). Alongside this, a couple of people said they were already abiding by all national COVID-19 guidelines and restrictions in place (eg, mask wearing) and because of this did not see any reason to get tested (3c). There was also a belief among a few people that because they had received either one or both of their COVID-19

- 3a. They've all been a long way off as far as I'm concerned, places that I don't consider are local to me, therefore I would be breaking restrictions if I drove over to one of those anyway [NA23, F, 65 years]
- 3b. No, because of the circumstances that I'm in, I'm not travelling anywhere, I'm not meeting anyone apart from literally going out to do my food shopping once a week and take all precautions with hand washing and mask wearing, and sanitising and you name it [NA28, F, 57 years]
- 3c. You know, I go out, I wear a facemask, I keep my hands clean, I am careful and conscious of other people so I just feel that's [testing] a bit much as well [NA26, F, 43 years]
- 3d. I assumed, which is probably wrong, that once I'd had the job I wasn't the right sort of individual. What is the answer? Was I still able to go along as a test individual, shall we say?... because I've already got the antibodies starting to develop in my body and everything [NA20, M, 73 years]
- 3e. I know some people have said that they're never going to go and get tested, because if they prove positive they haven't got time to self-isolate, I know a few people have said that [A18, M, 46 years]
- 3f. Everybody seems to think if you haven't got the symptoms you haven't got it, they don't understand the asymptomatic thing; so many people, they don't understand that at all, it's unbelievable [A05, F, 50 years]
- 3g. I know that there's been a lot of fake news, especially on social media at the minute where people are saying, you know with the numbers and things, you know all the conspiracy theories that are going around. I don't know if people are possibly being put off by them [A07, F, 26 years]

**Figure 3** Reasons for not attending community testing: personal and perceived.

vaccinations, they no longer needed to get tested (3d). There were many other reasons given by those who had not attended a CT site, although by only two or three of the interview participants. These included: the perception people had immunity due to recently having COVID-19, uncertainties about the validity of the LFT, the risk of contracting COVID-19 from attending a CT site, concern over the repercussions of receiving a positive test result (eg, self-isolation and loss of livelihood), a lack of information about asymptomatic testing and whether they should be attending, and having never heard of CT facilities.

#### Reasons for not attending CT: perceived

Views were also sought from all those interviewed on the barriers other people in the community might face when considering whether to go along to a CT site.

The most common belief around why people in the community did not attend CT was the fear of testing positive for COVID-19 and the impact that this would have (eg, self-isolate, remove children from school, stop work, reduced/no income) (3e). A few people added that if people had already experienced self-isolation (having had COVID-19 or as a precaution), they would probably try to avoid this situation happening again and therefore not voluntarily go for testing. Another common reason given was anxiety around taking the LFT.

There was a belief among many that people in the community had little comprehension of what CT aimed to do, why they had been set up and that anyone could attend (without symptoms). People went on to say that this lack of information meant people could not make an informed decision about whether to attend CT. It was believed that some people in the community did not understand the concept of asymptomatic testing because the general principle behind it (that you can have the

virus asymptotically) was not fully understood (3f). Linked to the idea that people might not have enough information about CT was that people in the community may have in fact been obtaining factually incorrect information or ‘conspiracy theories’ related to COVID-19. People thought this type of information would prevent people from attending CT (3g).

There was a perception among some that many in the community lacked a sense of personal responsibility around transmitting the virus. There was also a feeling that people were getting tired of COVID-19 guidance and restrictions and this included attending testing sites.

#### Theme 4. Views on future attendance and facilitating community attendance

Information presented within this theme is drawn from interviews across the whole dataset.

##### Personal views on future attendance

In light of the positive experience people had in attending a CT site (outlined in theme 2), all attenders confirmed that they would go to a CT site again, although a few people said they were unsure how long they should wait between visits. Most of those who had never attended a CT site (non-attenders) said they would consider attending a CT site in the future, especially if someone requested for them to attend one (eg, their employer or a governmental body), they were located closer to where they live, or if they had a better understanding as to why they might need to attend one (figure 4; 4a). In addition, many people (attenders and non-attenders) said they would attend CT to facilitate further steps in the government’s ‘roadmap’ out of lockdown or if they wanted reassurance when visiting family members. A few people gave

reasons why they would not attend a CT site in the future: having access to LFT either through work or their local pharmacy or because they had been vaccinated. Some people were under the impression that testing would not be required once they started getting vaccinated; others assumed it was still warranted.

##### Facilitating attendance

There was a perception among all participants that very few people in the community knew about CT (4b). Low awareness was often linked to lack of advertising, as outlined in theme 1; many said they had not seen or heard any form of advertising related to CT. As a result, nearly everyone suggested increasing the level of advertising and publicity surrounding CT to encourage attendance. Many avenues for advertising were suggested: regional/local television or radio, websites and email lists of local networks (eg, surgeries), social media (to include Facebook, Instagram and TikTok), household leaflet drop, links on COVID-19 apps (eg, NHS and Zoe) and physical posters or signs at CT sites, surrounding areas (adjacent streets and local parks), town centres and supermarkets (4c). People also said word of mouth was important in promoting CT sites, both in person and via social media. However, people did admit that with COVID-19 restrictions in place it was hard to get messages out to the community. A few people did highlight the importance of not just relying on social media advertising, as this excluded many vulnerable or elderly people who were often most at risk.

Not only did people suggest increased advertising but that the information around CT sites needed to be clearer and should include why these sites have been set up, who could attend and reasons for attendance, and what people should expect if they went for testing (4d). For example, people wanted clarity on having to live or work ‘locally’ in order to attend as this had prevented a few from attending. Also, as highlighted earlier in this theme, people wanted to know if they should attend CT once vaccinated. Some people spoke about how they thought the messaging and guidance presented to the public at a national level about all facets of the pandemic had been generally unclear and felt this was echoed in the information they had received about CT. People went on to say they felt the notion of ‘no one is safe until everyone is safe’ should have played a prominent part in national messaging, and in turn, this messaging would have been beneficial when promoting local CT sites. Finally, some suggested that CT could be set up in larger workplaces or that workplaces could promote attendance among their staff and give people the time to attend in work hours.

## DISCUSSION

### Main findings

This study found that people’s experience of attending a ‘walk-in’ asymptomatic CT site in Derbyshire was overwhelmingly positive. Most of those attending had done so at the request or suggestion of their place of work. Those

4a. *If the evidence was made available to me to suggest that it would be a good idea for me to go and have a lateral flow test, yeah, I'd be there at the drop of a hat.....if I knew exactly why I needed to have a lateral flow test, then I would be absolutely willing to attend [NA28, F, 57 years]*

4b. *I think they need to be spoke about a lot more to be honest because everyone I've told didn't even know you could do it, well I didn't myself and like I said, I like to think I'm pretty clued up with all this COVID testing and keeping yourself safe. But yeah, I never knew about lateral flow. And if the government could do a bit more about promoting it, even though we're close to the finish line but they could still promote it a lot more than, well they haven't in my opinion because I didn't know nothing about it [A13, M, 30 years]*

4c. *Publicity, local publicity. They need to really tell everybody, get it through to everybody because I know a lot of people are not signed up to these county council emails so local people, it's a difficult one, I think probably the best way would be to leaflet people so that you actually get something through your letterbox that tells you about it. Because if people don't know, they're not going to come are they? [NA23, F, 65 years]*

4d. *Basic information really needs to be there, upfront, and positive in the sense of joining people in saying. "Right okay this is something that would be good to do, or necessary to do if you find yourself in X, Y and Z circumstance.".... to encourage the footfall by describing perhaps different scenarios, like myself, I've had a vaccination first dose, do I actually need to go, would I need to go or not? It's making the information almost as personal as possible to the individual.... I just wonder if that might be a bit more of an appeal for people to go along to be tested [NA28, F, 57 years]*

**Figure 4** Views on future attendance and facilitating community attendance.

who got tested spoke about the reassurance of a negative test offered. Awareness of CT sites was perceived to be low throughout the county, in addition to lack of understanding about what or who the sites were for. Individuals linked this to low level of advertising they had seen, in addition to a lack of clarity in the information provided.

### Discussion of findings

The positive attitudes towards testing that attender participants reported echoes findings from the Liverpool CT pilot.<sup>12</sup> Most of those attending had done so at the request or suggestion of their employer; this suggests that the testing programme was successful in gaining participation from individuals leaving their homes for work. Other reasons for getting tested were similar to those reported in previous research, including reassurance about whether they had the virus and preventing virus transmission, particularly among vulnerable members of their household.<sup>12 20</sup>

A small proportion of non-attenders were not aware of the programme prior to taking part in the study. Other reasons for non-attendance included people not believing they were eligible, the distance needed to travel and not perceiving testing as necessary due to limited contact with others and following other COVID-19 guidelines. Many non-attenders did not understand the need for them to get tested. Unlike in the Liverpool pilot,<sup>12</sup> concerns about test accuracy and the utility of a negative test result were not mentioned as reasons for non-attendance. There was a perception that others in the community had not attended as they could not or did not want to deal with the consequences of a positive test.

The Derbyshire County Council testing programme reached a smaller proportion of the population than the Liverpool programme.<sup>7</sup> This may be explained by the lower level of resources available for the Derbyshire programme and the urban setting of the Liverpool programme, which facilitated access. We found there was a lack of awareness of the programme and lack of understanding of the purpose of the programme and who it was for, which may have created additional barriers. This is consistent with reports of implementation of asymptomatic testing in other local authorities in England, which showed inconsistencies in messaging around the meaning and implications of a negative test, and the frequency with which people should attend.<sup>21</sup> Over half of attendees were attending for the first time, which reflects that only about a quarter of participants were tested more than once.<sup>14</sup> Repeated testing was also a challenge in the Liverpool pilot.<sup>12</sup> Public health COVID-19 screening requires frequent testing of large proportions of the population,<sup>10</sup> as well as an understanding among participants that a negative test result does not necessarily imply that they are not infected. Since April 2021 home testing kits have been available, with the recommendation that people take a test twice a week. This has reduced barriers to testing, although there have been concerns that testing

has been insufficiently targeted, with key groups unable to access testing and others using tests excessively.<sup>22</sup>

Effective and consistent messaging via appropriate channels is clearly essential to the success of CT programmes. The Liverpool pilot highlighted that simply providing more information may not be sufficient due to people feeling overwhelmed by the volume of information, and there are several aspects that must be communicated, including the availability of testing, who it is for and why, how often they should attend and the implications of a positive or negative result.<sup>12</sup> Health messaging should outline appropriate expectations of screening, especially around sensitivity and specificity so that false negatives and false positives do not erode the public's trust.<sup>10</sup> Messaging must explain that a negative test does not necessarily imply that people are not infected.<sup>23</sup>

### Strengths and limitations

There are several strengths to this study. There has been little research to date exploring views of the general public towards asymptomatic testing sites. The study participants included both people who had and had not attended a CT site, helping to understand both the strengths and limitations of the service and the facilitators and barriers to access. Using one-to-one interviews elicited in-depth opinions from both groups.

This study was undertaken in one county in England with a sample that was predominately White British (91%) and over three quarters were in paid employment (79%). Although the sample appeared representative of Derbyshire (in 2018, ethnic minorities made up 4% of Derbyshire's population and 70% of the county were in paid work<sup>24</sup>), this may limit the findings' transferability to other areas and in particular groups under-represented in our sample. Around half of the sample (both attenders and non-attenders) were key workers. This may, to some extent, explain why over half of our sample outlined that their employer had initially made them aware of CT sites and of those who had attended a CT site, half had done so at the request of their workplace. Nevertheless, these findings do highlight key considerations in setting up and communication about CT sites.

Non-attenders were recruited and interviewed approximately 2 months later than attenders; by this point, UK government COVID-19 restrictions had changed to be more relaxed and a higher proportion of the population was vaccinated—as reflected in the higher proportion of vaccinated individuals within our non-attender sample. This may have contributed to a variation in opinions.

The success of CT relies on both extensive testing and self-isolation following a positive test. None of the attender participants had tested positive when attending a CT site. We were therefore unable to explore further issues around the implications of self-isolation, for example, the impact on work and pay. Throughout the period of data collection, the UK Government did offer those on low income financial support with self-isolation in the event of testing positive for COVID-19 (either via PCR or assisted LFT),<sup>25</sup>



and although we did not directly collect information regarding awareness of this financial scheme, none of the participants acknowledged that this type of support was available when discussing barriers or facilitators to attend CT. Previous research has suggested that having to isolate following a positive test would influence the decision to use an asymptomatic testing service.<sup>12 26</sup>

## Implications

Large-scale public health screening has the potential to be the most powerful type of COVID-19 testing,<sup>10</sup> however, if not delivered appropriately, it risks being ineffective, a poor use of resources and potentially harmful.<sup>27</sup> This study has demonstrated that for those attending CT sites, the experience was generally positive. However, the study identified barriers in terms of awareness of the service and understanding of who it was for and why it was needed. A challenge at local authority level may have been the rapidly changing guidance from central government and the need to tailor information for local communities. Large-scale CT has ended in the UK, with free access to LFT kits and self-isolation requirements being discontinued.<sup>3</sup> Testing is likely to become more targeted at groups at high risk of infection, such as students in higher education.<sup>28</sup> There is a continued need to understand how best to communicate the availability and need for testing to ensure that testing is accessible and tailored to all targeted groups so that it reaches those most in need.<sup>27</sup> Furthermore, lessons learnt from COVID-19 testing may be relevant to testing for other conditions for which large-scale public health screening is required, including in the case of any future pandemics.

**Contributors** TL, IB, KC, JRM, LJ, SD and NR developed the study, with LJ completing all data collection. Authors working at Derbyshire County Council (SD and NR) facilitated access to community testing sites when recruiting attendees and supported communications with voluntary organisations in recruiting non-attendees. LJ and EJ conducted independent analysis of the transcripts and coded all the data. LJ led the draft of the manuscript, supported by TL and IB. All authors had input to the final version of the manuscript. LJ will be responsible as guarantor.

**Funding** This study is independent research supported by Derbyshire County Council (ref: 5275123) as part of a mixed methods process and outcome evaluation of the county's COVID-19 asymptomatic community testing pilot.

**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Consent obtained directly from patient(s).

**Ethics approval** This study involves human participants and was approved by the Faculty of Medicine and Health Sciences (University of Nottingham, UK) research ethics committee (FMHS-248-0221). Participants gave informed consent to participate in the study before taking part.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available upon reasonable request. The data underlying this article cannot be shared publicly to protect the privacy of participants. The data will be shared on reasonable request to the corresponding author.

**Supplemental material** This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content

includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

## ORCID iDs

Leah Jayes <http://orcid.org/0000-0002-5240-6286>

Kaushik Chattopadhyay <http://orcid.org/0000-0002-3235-8168>

Joanne R Morling <http://orcid.org/0000-0003-0772-2893>

## REFERENCES

- Buitrago-Garcia D, Egli-Gany D, Counotte MJ, *et al.* Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: a living systematic review and meta-analysis. *PLoS Med* 2020;17:e1003346.
- Al-Sadeq DW, Nasrallah GK. The incidence of the novel coronavirus SARS-CoV-2 among asymptomatic patients: a systematic review. *Int J Infect Dis* 2020;98:372–80.
- UK Health Security Agency. Stay at home: guidance for households with possible or confirmed coronavirus (COVID-19) infection. Available: <https://www.gov.uk/government/publications/covid-19-stay-at-home-guidance/stay-at-home-guidance-for-households-with-possible-coronavirus-covid-19-infection#:~:text=People%20who%20have%20COVID%2D,must%20stay%20at%20home> [Accessed 28 Oct 2021].
- Bai Y, Yao L, Wei T, *et al.* Presumed asymptomatic carrier transmission of COVID-19. *JAMA* 2020;323:1406–7.
- Jung C-Y, Park H, Kim DW, *et al.* Clinical characteristics of asymptomatic patients with COVID-19: a nationwide cohort study in South Korea. *Int J Infect Dis* 2020;99:266–8.
- Arons MM, Hatfield KM, Reddy SC, *et al.* Presymptomatic SARS-CoV-2 infections and transmission in a skilled nursing facility. *N Engl J Med* 2020;382:2081–90.
- Bae SH, Shin H, Koo H-Y, *et al.* Asymptomatic transmission of SARS-CoV-2 on evacuation flight. *Emerg Infect Dis* 2020;26:2705–8.
- Goldberg SA, Lennerz J, Klompas M, *et al.* Presymptomatic transmission of severe acute respiratory syndrome coronavirus 2 among residents and staff at a skilled nursing facility: results of real-time polymerase chain reaction and serologic testing. *Clin Infect Dis* 2021;72:686–9.
- Lu J, Gu J, Li K, *et al.* COVID-19 outbreak associated with air conditioning in restaurant, Guangzhou, China, 2020. *Emerg Infect Dis* 2020;26:1628–31.
- Mina MJ, Andersen KG. COVID-19 testing: one size does not fit all. *Science* 2021;371:126–7.
- Leber W, Lammel O, Siebenhofer A, *et al.* Comparing the diagnostic accuracy of point-of-care lateral flow antigen testing for SARS-CoV-2 with RT-PCR in primary care (REAP-2). *EClinicalMedicine* 2021;38:101011.
- Liverpool Covid-SMART community testing pilot: evaluation report. Available: <https://www.liverpool.ac.uk/coronavirus/research-and-analysis/covid-smart-pilot/> [Accessed 27 Oct 2021].
- Office for National Statistics. Mid-Year population estimates, UK, June, 2020. Available: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesandscotlandandnorthernireland> [Accessed 28 Oct 2021].
- Derbyshire County Council. COVID-19 Community Testing Pilot - Interim Report. [Personal communication].
- Department of Health and Social Care. COVID-19 Response - Spring, 2021. Available: <https://www.gov.uk/government/publications/covid-19-response-spring-2021> [Accessed Aug 2021].
- UK Government. Coronavirus (COVID-19) in the UK. Available: <https://coronavirus.data.gov.uk/details/download> [Accessed Aug 2021].
- Braun V, Clarke V. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qual Res Sport Exerc Health* 2021;13:201–16.
- Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.



- 19 Mathison S. Why Triangulate? *Educational Researcher* 1988;17:13–17.
- 20 Wanat M, Logan M, Hirst JA, *et al.* Perceptions on undertaking regular asymptomatic self-testing for COVID-19 using lateral flow tests: a qualitative study of university students and staff. *BMJ Open* 2021;11:e053850.
- 21 Mahase E. Covid-19: people are not being warned about pitfalls of mass testing. *BMJ* 2021;372:n238.
- 22 Majeed A. It's time for more targeted use of lateral flow tests for covid-19. *BMJ* 2022;376:o28.
- 23 Mina MJ, Parker R, Larremore DB. Rethinking Covid-19 test sensitivity — a strategy for containment. *N Engl J Med Overseas Ed* 2020;383:e120.
- 24 Derbyshire Observatory. Data and statistics for Derbyshire. area profile: districts. Available: [https://observatory.derbyshire.gov.uk/wp-content/uploads/reports/profiles/area\\_profiles/district/Amber\\_Valley\\_Area\\_Profile.pdf](https://observatory.derbyshire.gov.uk/wp-content/uploads/reports/profiles/area_profiles/district/Amber_Valley_Area_Profile.pdf) [Accessed Jul 2022].
- 25 UK Government. Claiming financial support under the test and trace support payment scheme, 2020. Available: <https://www.gov.uk/government/publications/test-and-trace-support-payment-scheme-claiming-financial-support-claiming-financial-support-under-the-test-and-trace-support-payment-scheme> [Accessed Apr 2022].
- 26 Blake H, Knight H, Jia R, *et al.* Students' views towards Sars-Cov-2 mass asymptomatic testing, social distancing and Self-Isolation in a university setting during the COVID-19 pandemic: a qualitative study. *Int J Environ Res Public Health* 2021;18:4182.
- 27 Raffle AE, Pollock AM, Harding-Edgar L. Covid-19 mass testing programmes. *BMJ* 2020;370:m3262.
- 28 Matheson NJ, Warne B, Weekes MP, *et al.* Mass testing of university students for covid-19. *BMJ* 2021;375:n2388.
- 29 UK Government. Guidance: children of critical workers and vulnerable children who can access schools or educational settings. Available: <https://www.gov.uk/government/publications/coronavirus-covid-19-maintaining-educational-provision/guidance-for-schools-colleges-and-local-authorities-on-maintaining-educational-provision> [Accessed Sep 2021].