

1 **How best do we engage the general population in testing for COVID-19?**

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48 Professional Services at the University of Southampton granted Administrative Research Ethics and
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52 18 years old as it is not required for institutional research.

53 **Abstract**

54 The UK Scientific Advisory Group for Emergencies (SAGE) emphasises the need for high levels of
55 engagement with communities and individuals to ensure the effectiveness of any COVID-19 testing
56 programme. A novel pilot health surveillance programme to assess the feasibility of weekly mass
57 RT-LAMP testing for the SARS-CoV-2 virus using saliva samples collected at home was
58 developed and piloted by the University of Southampton and Southampton City Council. Rapid
59 qualitative evaluation was conducted to explore experiences of those who took part in the
60 programme, of those who declined and of those in the educational and healthcare organisations
61 involved in the pilot testing who were responsible for roll-out. This included 77 interviews and 20
62 focus groups with 223 staff, students, pupils and household members from four schools, one
63 university, and one community healthcare NHS trust. Conversations revealed that high levels of
64 communication, trust and convenience were necessary to ensure people's engagement with the
65 programme. This suggests community leaders and stakeholder organisations should be involved
66 throughout programme development and implementation to optimise these features of the testing.
67 Participants' and stakeholders' motivations, challenges and concerns need to be understood and
68 these insights used to modify the programme in a continuous, real-time process to ensure and
69 sustain engagement with testing over the extended period necessary.

70 **Introduction**

71 Universal, repeated, weekly testing followed by strict household isolation after a positive test and
72 continued normal life after a negative test, has been promoted in the UK as an important exit
73 strategy from the current COVID-19 (SARS-CoV-2) pandemic.⁽¹⁾ A novel pilot programme to
74 assess the feasibility of weekly mass RT-LAMP testing^(2,3) for the SARS-CoV-2 virus using saliva
75 samples collected at home was developed and piloted in a unique partnership (the Southampton
76 COVID-19 Saliva Testing Programme) between Southampton City Council and the University of
77 Southampton. Between June and October 2020, participants from two general practices in
78 Southampton, staff and students at the University of Southampton and staff and pupils from one
79 infant, one junior, one primary and one secondary school in the city were invited to participate in
80 two phases of a pilot of the Southampton COVID-19 Saliva Testing Programme. The four schools
81 had catchment areas in more deprived parts of the city, and the pupils were from diverse ethnic
82 backgrounds. More than a quarter of students at the University of Southampton come from outside
83 the UK. Interactive engagement activities took place alongside the testing programme to maximise
84 uptake of saliva testing, with extensive development and deployment of educational materials
85 targeting different age groups of students and pupils in the schools, alongside work to engage
86 university students.

87 The UK Scientific Advisory Group for Emergencies (SAGE) emphasises the need for high levels of
88 engagement with communities and individuals in the creation of successful mass testing
89 programmes.⁽⁴⁾ High levels of engagement with the community builds trust, shared goals, and a
90 sense of fairness;^(5, 6) engagement also bridges cultural and language gaps.⁽⁷⁾ A rapid review of the
91 role of community engagement in the response to COVID-19 found that local community leaders
92 and stakeholders took on important programme functions, including designing and planning,
93 building trust, negotiating community entry and behaviour change and risk communication.⁽⁸⁾

94 Rapid qualitative evaluation can be used when the public sector requires immediate feedback on
95 programme process and impacts in order to shape policy.⁽⁹⁾ Hence, this type of approach lends itself
96 to providing insights into the response to public health recommendations and programmes during
97 the COVID-19 pandemic. Data generated describing people’s lived experiences of the infection,
98 their behaviour and responses to the government efforts to contain the virus have complemented
99 and explained the epidemiological data.⁽¹⁰⁾ Other studies involving rapid qualitative methods
100 during the pandemic have provided ‘real-time’ feedback on current public health practices⁽¹¹⁾ and
101 have informed the design of the UK’s COVID-19 response.⁽¹²⁾ This approach was established to
102 inform iterative development and testing of programmes and interventions and has been shown to
103 produce findings comparable to those of more traditional qualitative research and thematic
104 analysis.^(13, 14)

105 To generate insights and inform the design and modification of the Southampton COVID-19 Saliva
106 Testing Programme, we conducted a rapid qualitative evaluation exploring the experiences of
107 individuals and organisations who took part and of those individuals who declined to take part to
108 inform the development of the next phase of the programme for mass-testing.

109 **The rapid qualitative evaluation**

110 Between 4th June and 7th November 2020, we conducted 77 interviews and 20 focus groups with
111 223 staff, pupils, students and household members, from four schools, one university, and two GP
112 practices belonging to one Clinical Commissioning Group in the city of Southampton in the South-
113 East of England. Three groups of participants took part in interviews and focus groups: i)
114 individuals who had been approached about taking part in the pilot Saliva Testing Programme
115 including some who tested positive; ii) those who were approached but declined to take part; and
116 iii) senior university, primary care and school representatives responsible for delivering the Saliva
117 Testing Programme in their organisations. The majority of participants in this qualitative study were
118 recruited via the testing programme’s online registration process, a feedback form on the

119 Southampton City Council website, during a phone call with the testing programme team to those
120 who tested positive or inconclusive, or through the schools' weekly newsletters about the
121 programme. Senior university and school representatives and a minority of other participants were
122 recruited through the testing team's and participants' professional networks. Participants gave
123 permission for their contact details to be shared with the qualitative evaluation team and were
124 offered a small financial incentive to take part. Participants aged under 18 years and their parents
125 signed consent forms. Participants' characteristics are outlined in Table 1.

126 Focus groups were conducted using Zoom Pro and audio-recorded using Open Broadcast Software;
127 telephone interviews were recorded using Olympus recorders and a microphone earpiece.

128 Participants gave verbal consent for discussions to be recorded at the start of each interview and
129 focus group. Focus groups and interviews were conducted using semi-structured discussion guides
130 developed by experienced qualitative researchers informed by the needs of the programme team and
131 revised iteratively in the light of insights gained. Findings from the focus groups and interviews
132 were synthesised rapidly and added to a report, which was edited collectively by the evaluation
133 team and continuously updated as new data and insights were generated. This report was used to
134 provide immediate feedback to the programme team enabling them to make modifications to the
135 running of the programme, and to offer insights to other groups in the UK developing similar
136 testing programmes. At the end of the pilot phases of the programme, rapid analysis of the material
137 gathered in the shared report was conducted using a framework of themes which addressed three
138 questions:⁽¹⁵⁾ (i) what made people engage with the testing programme?; (ii) how could engagement
139 with the testing programme be improved?; and (iii) what were the impacts on participants of
140 engaging with the testing programme? Notes taken during the focus groups and interviews guided
141 the selection of quotes which were transcribed directly from the audio-recordings.^(11, 16, 17) Direct
142 quotes from participants illustrating the range of responses as they relate to the three questions are
143 provided in Table 2. In a final phase of analysis, a public consultation activity was undertaken with

144 public contributors hosted by the Wessex Public Involvement Network, during which our
145 interpretation of the data was validated.

146 **Table 1. Characteristics of participants (n = 223)**

Groups	Negative test result	Positive/ Inconclusive test result	Total number of people
University			
University students	67	14	81
University staff	28		28
Senior university representatives			5
School			
School pupils	30		30
School staff	20	1	21
Pupil/parent pairs (6 pairs)	3	3	12
Parents	10	3	13
Senior school representatives			12
General practice			
GP staff	8		8
Those who declined to take part			13
Total			223

147

148 **1. What made people engage with the testing programme?**

149 **Communication** Participants emphasised the need for open and transparent communication from
150 programme implementers of the reasons they should register for the programme, how to go about
151 registering and why they should stay registered. They felt these communications should be
152 motivating in content. To do this, they needed to address participants' sense of community and
153 make clear how easy and convenient the testing regime was for both those who took part and for
154 those who were managing the programmes within their organisations. Parents, school pupils and
155 staff described finding open communication with the programme team reassuring and therefore
156 motivating. This open communication was led by senior representatives of the organisations taking
157 part, who also emphasised preparation, leadership buy in and using data management systems to
158 scale up as important to the success of the programme within their organisations. Transparent
159 information sharing between the testing team, participants, local and national stakeholders was seen
160 as a strength by programme implementers. Programme communications were also translated into

161 seven languages in Phase II to increase uptake by minority ethnic groups, seen by participants as
162 another strength.

163 **Community** Participants' decisions to take part and engage in the programme were, they felt,
164 influenced by a pull on their sense of community. Participants from schools and GP surgeries felt
165 this pull more strongly than participants from the University. The schools and GP surgeries were
166 smaller, more cohesive organisations, where staff and pupils saw one another every day, spoke
167 about the saliva testing frequently and encouraged one another to take part. This was less evident in
168 the University. Automatic registration of all school students may also have normalised participation
169 in the testing programme, where university students had to make the decision to register as
170 individuals. University students suggested that taking part in the testing programme could be
171 normalised by employing testing champions in their halls and courses to promote the programme
172 and by using an 'opt-out' process for participation. School pupils and university students were
173 offered interactive educational activities being run to increase engagement with the testing
174 programme. Those who took part in these activities reported understanding more about the science
175 involved in managing the pandemic, which they felt increased their motivation to protect their
176 communities. Senior school and university representatives appreciated the role that the programme
177 played in connecting senior community stakeholders across Southampton in a way that had not been
178 evident before. Finding common cause through using the Saliva Testing Programme was seen as an
179 unexpected benefit from their involvement.

180 **Convenience** Most participants found the programme procedures easy and convenient; registration
181 processes were simple, drop off points were accessible, testing instructions were clear. It perceived
182 to be easier to carry out than nasopharyngeal PCR swab tests and test results were received quickly.
183 They felt that making participation as convenient and easy as possible was key to increasing uptake.
184 Parents reported that the test was simple enough for children to take responsibility for carrying out
185 tests independently. From the perspective of the organisations, initial engagement was motivated by
186 the cost-effectiveness of the programme and the value of having data on infection to manage

187 outbreak hotspots by integrating programme data with data from symptomatic PCR testing, to keep
188 the schools, the university and GP practices running.

189

190 **2. How could engagement with the testing programme be improved?**

191 **Building trust** A major reason some chose not to take part in the programme was that they did not
192 trust the Government with their data. Many of those who declined to take part in the Saliva Testing
193 Programme were anxious about the possibility of losing control of their data when the programme
194 passed them to NHS Test and Trace in the event of a positive test. The local NHS Foundation Trust
195 and its partnership with the University and Southampton City Council, however, was trusted; it was
196 seen to have scientific integrity, and as a local organisation, was felt to be answerable to the
197 Southampton community in a way NHS Test and Trace was not. Some suggested that they would
198 have been more likely to take part if the programme was run solely by local organisations.

199 Participants and decliners were clear that building trust was necessary to improve engagement in the
200 programme. They suggested that this would be helped by receiving more directed information from
201 credible sources such as the university and Southampton City Council about the rationale for and
202 design of the programme, about data protection and the accuracy of the tests, and about the progress
203 of the programme. This information would increase transparency and help dispel myths, particularly
204 about the accuracy of the saliva test. One reason some people declined to take part in the
205 programme was a concern about the personal consequences of a false-positive result.

206 **Extra support for testing positive** Those who had experienced a positive test result asked for more
207 efficient data management by the testing programme, NHS Test and Trace and their general
208 practice, and more coordinated messaging. Participants requested more personalised support for
209 those testing positive and having therefore to self-isolate. This included financial aid if unable to
210 work, receiving food and medication supplies and mental health support. Some felt, however, that
211 there were too many support calls from NHS Test and Trace for those testing positive. Participants
212 were particularly worried about the possibility of spreading the virus to others whilst they waited

213 for a test result, and feared the stigma of testing positive, which suggests that they would need
214 reassurance and social support in dealing with a positive test result. Fear of a positive test result was
215 enough to make some decline to take part; they were concerned that if they had to isolate they
216 would lose income, their employer would be unsympathetic and that a history of infection with the
217 virus might affect their ability to get a mortgage and life-insurance. These people preferred not to
218 know their viral status.

219 **Increasing accessibility** Both decliners and participants recommended making the programme
220 more inclusive and accessible to a wider group of those eligible to take part. Drop-off points for
221 saliva samples that catered for people living outside Southampton and more frequent, convenient
222 and better sign-posted drop-off points within Southampton would have reduced the distances people
223 had to travel. Some suggested postal deliveries and returns. Comprehensive translation of all
224 programme communications would have increased uptake and engagement of those from minority
225 ethnic communities.

226 **Practical improvements** Many improvements suggested by participants were incorporated into the
227 programme as it evolved (see Box 1). A small minority of participants, especially parents of
228 younger children, had issues producing enough saliva, which may have produced an inconclusive
229 result. They suggested the tubes be marked with a clear indicator of the amount necessary. Some
230 decliners missed the University registration email and recommended putting key information
231 highlighted at the top of emails. Senior representatives of organisations involved were clear that the
232 programme gave their staff added responsibilities and added to their workload. Whilst accepting
233 that this extra work was in a good cause, some suggested a ‘toolkit’ of instructions and tips for
234 those implementing the programme to help manage the expectations of both staff and participants.

235

236 **3. What were the broader consequences for participants of engaging with the testing**
237 **programme?**

238 Participants reflected on the positive and negative impacts of participating in the testing
239 programme. Positive outcomes included:

240 **Reassurance** They generally felt reassured by knowing their viral status and expressed a sense of
241 relief and reduced feelings of anxiety when they tested negative. They appreciated knowing they
242 were not spreading the virus, felt that this enabled a “near normal” life to continue and were more
243 confident going to school or work and visiting vulnerable family and friends. This was perceived to
244 be an incentive for taking part in the programme.

245 **Pride** Participants expressed pride in knowing that they were contributing to a programme that was
246 part of the national effort to manage the pandemic. Some viewed this as a privilege and others were
247 excited. Southampton university students spoke of being envied by those from other universities
248 and felt that the testing programme made the university attractive to prospective students. Senior
249 university representatives spoke of the reputational benefit to the organisation of having provided a
250 testing programme for the local community.

251

252 Participants expressed a number of concerns:

253 **Environmental impact** Some were concerned about the amount of plastic in testing kits and the
254 environmental impact of an expansion of the testing programme.

255 **Increased chance of infection** Concern was expressed about the potential of those who received a
256 negative test result to become less vigilant in applying social-distancing and hygiene measures.
257 They were also worried that the test kit drop-off points were sites of potential infection; prior Health
258 and Safety risk assessments had however ensured that these carried no or minimal risk.

259 **Feelings of anxiety** Participants reported feelings of anxiety whilst waiting for their test results,
260 worrying about the personal consequences of having to self-isolate or of having unknowingly
261 passed the virus on to others whilst awaiting their test result. Others were anxious about the
262 possibility of the testing programme ending.

263 **Cultural barriers** Some participants were concerned that aspects of culture were a barrier to
 264 participation. These included language barriers and a cultural mistrust in central government. Those
 265 who had lived in countries where governments were believed to misuse personal data were more
 266 anxious about taking part in the Saliva Testing Programme because of the perceived threat to their
 267 privacy. Those who needed the testing programme most may in this way have been prevented from
 268 taking part.

269 **Table 2. Illustrative quotes**

Theme	Quote
1. What made people engage with the testing programme?	
Communication	<i>I would say that communication-wise from school to parents to communities - it has been strengthened... Our head teachers have been incredibly good with communication. ID46 School staff, Focus Group</i>
	<i>Firstly, I didn't know what it was about. Then when I got the newsletter, it told me all about it and when it told me all about it, I was feeling more confident and more calm. ID50 School pupils, Focus Group</i>
Community	<i>We know that we are keeping everyone healthy....It's about our whole community, we are all in this together. ID50 School pupils, Focus Group</i>
	<i>We have a WhatsApp group.. Its been good in that people have been like 'I have some glitches and stuff, I have, you know, or I'm late to deliver'.... I didn't actually see the message on my phone [test result], it was more that I heard that other people had received their message on their phone.... we have that WhatsApp group and people are quite active on that. ID03 GP staff, Interview</i>
	<i>When they [the children] had all the activities, they absolutely loved that and [it] helped them to understand a lot better what's going on around them. They loved the story, the mask, the glitter and [it] made them understand what's actually going on. ID46 School staff, Focus Group</i>
Convenience	<i>It's quite easy. The instructions were really clear, so I understood it. ID54 Parent & Child, Interview</i>
	<i>It's good that you can just walk up to campus and drop it off, and you know very quickly what the result is. ID72 University students, Focus Group</i>
2. How could engagement with the testing programme be improved?	

Building trust	<i>People are a little bit wary that samples of their saliva, their nose cells, their cheek swabs are being kept. ID83 University student, Interview</i>
	<i>I wouldn't want to share any data with Test and Trace at all. ID10 Decliner, Interview</i>
Extra support for testing positive	<i>I think my primary concern would be, obviously everyone I've come into contact with and then also income... a lot of student work is casual and obviously I can't be furloughed and sick-pay isn't the best with casual contracts. ID63 University students, Focus Group</i>
	<i>They [NHS Test and Trace] were ringing, you know, nearly every single day, saying you need to stay home. Constantly ringing, constantly, literally. ID68_School parent, Interview (Child with Positive result)</i>
Increasing accessibility	<i>If they live a little bit further out they'd have to take public transport to get to campus which is obviously putting themselves and others at risk ... to drop off. ID80 University students, Focus Group</i>
Practical improvements	<i>With the labelling I did just double check it as I wasn't sure whether to stick the label over the existing label on the pot, or write it on in pen. ID44 University students, Focus Group</i>
	<i>The only not so successful bit for us was my three year old really struggled to provide enough [saliva] so unfortunately we couldn't get him part of the testing programme but that was more the logistics of getting a three year old to spit. ID43 University students & staff, Focus Group</i>
	<i>But it's been a case of collating the packs for staff, you know, using our time to do that. Creating emails for internal staff to say actually we are going to summarise the booklet ... it's been a bit time heavy. ID09 GP representative, Interview</i>
3. What were the impacts on participants of engaging with the screening programme?	
Reassurance	<i>My partner's grandparents live quite close by. Being able to do the test and know that we didn't have it on the day that we then went to see them and could give them a hug, was an amazing thing. ID15 University staff, Interview</i>
	<i>It is a huge reassurance. This empowered parents to be able to make decisions about whether to send their child to school. This head teacher has volunteered to advise other schools entering the programme to iterate how amazing this programme is in keeping communities safe, and ensuring the continuity of education. ID92 Senior school representative, Interview</i>
Pride	<i>I thought it [the testing programme] was a good idea and it's an honour to be part of a test trial for what could help the world. ID49 School pupil, Focus Group</i>

	<i>We're really grateful for being involved and it's been a real privilege. I had a conversation with [member of staff] this morning and again they thanked me for organising it. ID90 Senior school representative, Interview</i>
	<i>It's given an example to the local community of the benefit of having research-intensive, quality university on their doorstep. You can imagine 'what's the university ever done for us?'... The University has received letters particularly from schools that are a part of Phase II, just saying how much they welcome the role the University has played in making them feel safer. ID94 Senior University representative, Interview</i>
Environmental impact	<i>The other thing that came back from my team that they thought about was the amount of plastic that was part of the pack and no way really to recycle it. Using quite a lot of plastic as part of the process was one of the not so positive things I think. ID43 University students & staff, Focus Group</i>
Increased chance of infection	<i>You have got to actually touch a receptacle to put the bags in [at the drop-off point] and there was no gel or wipes or anything close by and they [friend] were a bit panicky and had to use their own stuff. ID47 University students & staff Focus Group</i>
Feelings of anxiety	<i>I would panic if I tested positive because I have asthma... With all the [reports] I hear, I would be intubated. I would die. That would be the end of my life. ID43 University students & staff, Focus Group</i>
Cultural beliefs	<i>There is language barrier at our school as well. ... Yesterday we were on the verge of finishing this lovely programme, we got the translation letters. ... We've got Urdu, Pashto, Romanian, Somali, Polish, Bengali, so we have these six translations. I think that will make a difference for next week and increase the uptake of the programme. ID46 School staff, Focus Group</i>
	<i>In, especially Hong Kong right now its quite scary. If you have the saliva test or swab test right now the testing company or the government might get your DNA. Some of my friends are quite concerned about this part but because I just had to explain to them that the UK is different, they treat privacy very seriously. I try to tell them and reassure them but they are quite worried because in Hong Kong they are scared about the DNA or that the samples are being sent to China. ... But the UK might still have possibility to have accidental leaks if there are like other situations from airline companies, they have glitches in the system, some privacy just leaked out. Some freshers coming in this year, they are quite worried about the situation as it's been a long-standing issue there. ID48 University students & staff, Focus Group</i>

271 **Conclusions**

272 Individual participants and organisational representatives provided valuable insights into the
273 experience of engaging with the Southampton COVID-19 Saliva Testing Programme, leading to
274 changes in programme processes and communications, which undoubtedly increased engagement
275 and adherence to programme requirements. They also made important observations about the
276 benefits they experienced from engaging with the testing programme, some of which they suggested
277 should be emphasised to potential participants by those currently establishing testing programmes.
278 One of these benefits was increased knowledge about the science behind management of the
279 pandemic that school and university students gained from the educational engagement activities. As
280 well as providing insights, it was clear from the focus groups and interviews that the process of
281 seeking feedback from participants also increased the engagement of local people with the testing
282 programme.

283 Involving local people and organisations in the development and piloting of programmes in this
284 way may well have been important in ensuring community buy-in.⁽¹⁸⁾ They appreciated the chance
285 to contribute to this programme, which they saw to be of national importance. The process of
286 holding the conversations reported in this paper may also have helped to address two key
287 underlying issues affecting engagement with the testing programme: the need for trust between
288 participants and testing programmes, and the role of ‘collective efficacy’ within organisations.
289 Local organisations, such as schools and the university were seen to be answerable to local people
290 and hence more trustworthy than more national ‘faceless’ and private organisations such as NHS
291 Test and Trace. Collective efficacy is a group's shared belief in its capability to organise and
292 execute actions required to achieve goals,⁽¹⁹⁾ and a sense of collective efficacy appeared to be
293 stronger in the smaller, more cohesive organisations such as the schools and GP practices than in
294 the University, for example. Schools and GP practices had staff and student communities within
295 which members through daily conversation and mutual encouragement made regular testing the
296 ‘social norm’. The educational engagement activities appeared to play an important role in this too.

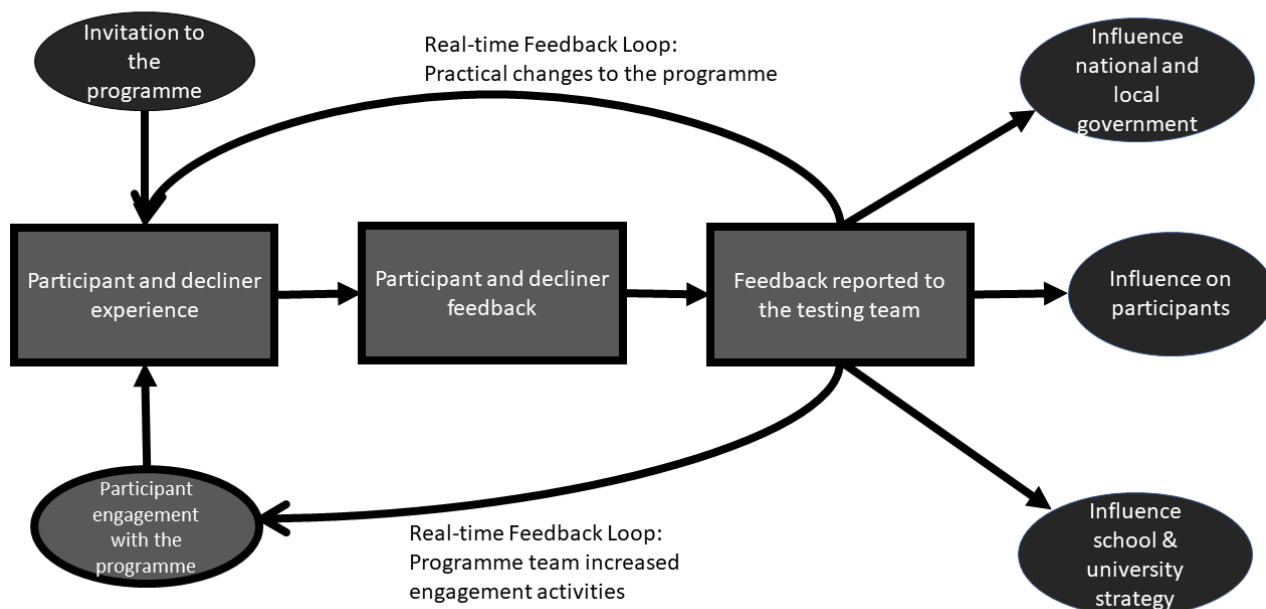
297 Students' increased knowledge appeared to make them more engaged with the programme and
298 motivated by the need to protect their communities, as well as making them feel like they had more
299 agency in controlling the spread of the virus and its damaging consequences. Schools and the
300 university were thus building collective efficacy for regular testing.

301 A rapid qualitative evaluation enabled real-time feedback of insights into the testing programme,
302 improving the participants' experience and was therefore likely to increase uptake of testing.
303 Insights gained were also used to inform university, schools, and city-wide strategies for managing
304 the pandemic and to feed-back to national and local government.⁽²⁰⁾ Figure 1 illustrates the way in
305 which the rapid qualitative evaluation influenced Saliva Testing Programme development and wider
306 testing strategy and Box 1 details the modifications made to the programme based on feedback
307 gathered through the interviews and focus group discussions. This study has also produced
308 actionable recommendations for improving engagement with COVID-19 testing programmes across
309 the UK. See Box 2 for details of these recommendations.

310 **Strengths and limitations**




311 The speed with which insights were needed to optimise the testing programme meant that a full and
312 rigorous traditional qualitative analysis of the data was not possible. Steps taken to ensure that our
313 findings were robust included regular team meetings to discuss interpretations, checking these
314 interpretations with participants in focus groups and interviews and consultation with experts from a
315 wide range of backgrounds. These steps are part of an established process for conducting rapid
316 qualitative evaluation.⁽¹¹⁻¹⁷⁾ Accessing those who declined to take part in the programme was
317 challenging, but those who were consulted offered important insights that informed significant
318 programme development. Future evaluations of testing programmes should explore participants'
319 experiences of indirect NHS Test and Trace contact tracing and household isolation as these are key
320 components of the effectiveness of population testing.

321 **Figure 1. How participants' experiences informed the Southampton COVID-19 Saliva Testing**
 322 **Programme wider strategy**



323

Box 1: Figure 1 Key and Modifications made to the Saliva Testing Programme as a result of participant feedback:

-  Programme inputs and outputs
-   Participant experiences of the programme

Modifications to the Saliva Testing Programme:

1. Resolved initial technical hurdles in the registration process and moved towards a more robust yet simple registration process in Phase II to reduce the barriers of registering;
2. Created clear and simple instructions, which were translated into seven languages, to reduce the number of inconclusive saliva test results;
3. Designed smaller labels to stick to the test pots to reduce the number of people placing them incorrectly and increasing the risk of receiving an inconclusive result;
4. Testing team communicated the test's accuracy and the progress of the programme in a weekly newsletter to schools and through emails to university staff and students;
5. Educational engagement activities were offered to university students to increase their involvement in the programme;
6. Commitment has been made to reduce the amount of plastic and to recycle containers in the next phase of the programme;
7. Post-boxes rather than team members placed at sample drop-off points to reduce possibility of transmission;
8. Increased number of drop-off points in Southampton to reduce the travel time for participants submitting their tests;
9. 'Toolkit' created for programme implementers to support preparation and roll-out for the next phase of the programme.

Box 2: Recommendations from the Southampton Saliva Testing Programme to ensure mass engagement in testing for COVID-19

1. Testing should be delivered through local organisations to both increase trust in the testing programme but also to promote collective efficacy;
2. Communications about testing should be clear, consistent and appeal to individual's sense of community and altruism to motivate people to take part in the programme;
3. Creative and fun educational activities should be used to improve knowledge and understanding of the virus, so increasing motivation to protect each other and sense of agency in managing consequences of the pandemic;
4. Participants and local organisers should be involved in designing their programme, and should be engaged in providing continuous feedback on the testing experience to enable real-time programme modifications;
5. Local organisations involved in delivering testing should be enabled to connect with one another to share best practice and create a local testing culture;
6. Those testing positive should be supported financially, psychologically, with food and medication and provided with reassurance and advice about how to minimise the possibility of transmission of infection to others;
7. Testing should be made as convenient for participants as possible and all communications need to be in multiple languages as well as appropriate for children and young people;
8. Thought needs to be given to making testing kits and processes as environmentally sustainable as possible.

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325 **References:**

- 326 1. Peto J, Alwan NA, Godfrey KM, Burgess RA, Hunter DJ, Riboli E, et al. Universal weekly
327 testing as the UK COVID-19 lockdown exit strategy. *The Lancet*. 2020; **395**:1420-1421.
- 328 2. Howson ELA, Kidd SP, Armson B, Goring A, Sawyer J, Cassar C, Cross D, et al.
329 Preliminary optimisation of a simplified sample preparation method to permit direct detection of
330 SARS-CoV-2 within saliva samples using reverse-transcription loop-mediated isothermal
331 amplification (RT-LAMP). *J Virol Methods*. 2020 - epub:114048.
- 332 3. Department of Health and Social Care. Rapid evaluation of OptiGene RT-LAMP assay
333 (direct and RNA formats). In: *Care DoHaS*, editor. 2020.
334 [https://www.gov.uk/government/publications/rapid-evaluation-of-optigene-rt-lamp-assay-direct-](https://www.gov.uk/government/publications/rapid-evaluation-of-optigene-rt-lamp-assay-direct-and-rna-formats/rapid-evaluation-of-optigene-rt-lamp-assay-direct-and-rna-formats)
335 [and-rna-formats/rapid-evaluation-of-optigene-rt-lamp-assay-direct-and-rna-formats](https://www.gov.uk/government/publications/rapid-evaluation-of-optigene-rt-lamp-assay-direct-and-rna-formats/rapid-evaluation-of-optigene-rt-lamp-assay-direct-and-rna-formats) (accessed
336 December 1, 2020).
- 337 4. Scientific Advisory Group for Emergencies. Multidisciplinary Task and Finish Group on
338 Mass Testing Behavioural Considerations. 2020.
339 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/9](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/916896/tfms-mass-testing-behavioural-considerations-s0724-200827.pdf)
340 [16896/tfms-mass-testing-behavioural-considerations-s0724-200827.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/916896/tfms-mass-testing-behavioural-considerations-s0724-200827.pdf) (accessed October 25,
341 2020).
- 342 5. Reicher S, Stott C. On order and disorder during the COVID-19 pandemic. *British Journal*
343 *of Social Psychology*. 2020; **59**(3):694-702.
- 344 6. Van Bavel JJ, Baicker K, Boggio PS, Capraro V, Cichocka A, Cikara M, et al. Using social
345 and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*.
346 2020; **4**:1-12.
- 347 7. Nazareth J, Minhas JS, Jenkins DR, Sahota A, Khunti K, Haldar P, et al. Early lessons from
348 a second COVID-19 lockdown in Leicester, UK. *The Lancet*. 2020; **396**:e4-e5.

- 349 8. Gilmore B, Ndejjo R, Tchetchia A, de Claro V, Mago E, Lopes C, et al. Community
350 engagement for COVID-19 prevention and control: A Rapid Evidence Synthesis. *BMJ Global*
351 *Health*. 2020; **5**:e003188.
- 352 9. Nunns H. Responding to the demand for quicker evaluation findings. *Social Policy Journal*
353 *of New Zealand*. 2009; **34**:89-99.
- 354 10. Teti M, Schatz E, Liebenberg L. Methods in the Time of COVID-19: The Vital Role of
355 Qualitative Inquiries. SAGE Publications Sage CA: Los Angeles, California, United States; 2020.
- 356 11. Vindrola-Padros C, Chisnall G, Cooper S, Dowrick A, Djellouli N, Symmons SM, et al.
357 Carrying Out Rapid Qualitative Research During a Pandemic: Emerging Lessons From COVID-19.
358 *Qualitative Health Research*. 2020; **30**: 2192-2204.
- 359 12. Gbesemete D, Barker M, Lawrence W, Watson D, De Graaf H, Read R. Exploring the
360 acceptability of controlled human infection with SARSCoV2—a public consultation. *BMC*
361 *medicine*. 2020;**18**:1-8.
- 362 13. Taylor B, Henshall C, Kenyon S, Litchfield I, Greenfield S. Can rapid approaches to
363 qualitative analysis deliver timely, valid findings to clinical leaders? A mixed methods study
364 comparing rapid and thematic analysis. *BMJ open*. 2018;**8**:e019993.
- 365 14. Beebe J. Rapid qualitative inquiry: A field guide to team-based assessment: Rowman &
366 Littlefield; Maryland, United States, 2014.
- 367 15. Lewis J, Ritchie J, Ormston R. Generalising from qualitative research. *Qualitative research*
368 *practice: A guide for social science students and researchers*. 2003;**2**:347-62.
- 369 16. Vindrola-Padros C, Johnson GA. Rapid techniques in qualitative research: A critical review
370 of the literature. *Qualitative Health Research*. 2020;**30**:1596-604.
- 371 17. Neal JW, Neal ZP, VanDyke E, Kornbluh M. Expediting the analysis of qualitative data in
372 evaluation: A procedure for the rapid identification of themes from audio recordings (RITA).
373 *American Journal of Evaluation*. 2015;**36**:118-32.

- 374 18. Burgess RA, Osborne RH, Yongabi KA, Greenhalgh T, Gurdasani D, Kang G, Falade AG,
375 Odone A, Busse R, Martin-Moreno JM, Reicher S. The COVID-19 vaccines rush: participatory
376 community engagement matters more than ever. *The Lancet*. 2020; **397**:8-10.
- 377 19. Bandura A. Exercise of human agency through collective efficacy. *Current directions in*
378 *psychological science*. 2000;**9**:75-8.
- 379 20. Godfrey K, Bagust L, Baird J, Barker M, Batchelor J, Bryant S, Colbain C, Everest H,
380 Flockhart A, Glyn-Owen K, Gow J, Hall M, Halliday B, Haydon M, Inskip H, Kerr K, Kutty H,
381 Johnson L, Johnston B, Lovelock D, Mortimore A, Musgrove J, Olden M, Parker H, Pearson R,
382 Roderick P, Sandford G, Slater-Jefferies J, Stock C, Watson D, Woods-Townsend K and Ziauddeen
383 N, on behalf of Southampton COVID-19 Testing Pilot Programme. Evaluation of the expanded
384 Southampton pilot study (Phase 2) for use of saliva-based lamp testing in asymptomatic
385 populations: Final report. 2020 Southampton, UK. University of Southampton 120pp.
386 doi:10.5258/SOTON/P0045
387
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