

Multidisciplinary Task and Finish Group on Mass Testing Behavioural Considerations

1. Effective mass testing for population case detection of SARS-CoV-2 will require high rates of testing *and* self-isolation (> 90%)^{1,2}, achieved equitably in any targeted population. Outlined below are key elements of any mass testing programme that could go some way towards achieving this.

Engagement

2. High levels of engagement in health-related research and interventions is built on trust, shared goals, and perceived fairness^{3,4,5}. Trust in those running services may be particularly important for engagement in government test and track systems⁶, with perceived credibility of government associated with likelihood of self-isolating⁷. High levels of engagement also require bridging cultural and language barriers to achieve engagement across diverse communities^{4,8}. The key principles for achieving this include co-design with target communities of interventions and messages, and promotion of collective identities⁹.
3. Messages that engage communities and individuals in any testing programme will include the rationale for testing, individual and collective benefits and responsibilities (including reassurance for those concerned about posing an infection risk to family and others) and addressing privacy concerns^{4,7,10}. It will also be important to specify the financial and other support that will enable self-isolation without incurring hardship (see ***Self-isolation and quarantine*** below). These messages – delivered using multiple media in multiple languages and formats - require evaluation to ensure they do communicate the intended messages effectively and equitably. The importance of these and other principles was highlighted in Leicester, where the NHS Test and Trace system faced major challenges in effectively engaging culturally diverse communities⁸.

Testing rates

4. A rapid review of evidence identified several barriers to symptom reporting during an outbreak of infectious disease, including lack of knowledge; concerns about stigmatization, privacy and financial consequences of infection; low concern about symptoms; and difficulties of attending a healthcare facility¹¹. It should be noted that this evidence is limited, based on cross-sectional designs with self-reported behavioural outcomes.
5. Amongst those who report symptoms consistent with COVID-19 in England, around 10% report requesting a test through the NHS Test and Trace system¹². ONS estimated 2400 new cases per day in England on 21st August 2020. The rolling average of new cases through Pillar 1 and Pillar 2 NHS TTI was around 800. This is largely (though not exclusively) symptomatic testing but suggests an upper rate of about 30% of those with symptoms requesting testing.

6. These low rates likely reflect many of the barriers to symptom reporting identified by Carter 2020. For example, the percentage of people who know that the symptoms of COVID-19 include cough and fever has remained steady at around 60% since April 2020¹². As PCD does not require people to have knowledge of what symptoms are relevant or to engage in a process of determining whether their own symptoms indicate the need for a test, uptake might be higher, all other things being equal.
7. There is a large literature on increasing uptake rates of screening and other population level interventions including vaccinations¹³⁻¹⁸. This includes a smaller literature on how to increase uptake equitably, *i.e.* to achieve uptake rates that are similarly high regardless of indices of deprivation^{19,20}. How any test is offered is a major predictor of uptake rates. Two considerations are particularly relevant to mass testing: accessibility of testing; and access provided by testing.
 - i. Accessibility of testing**
 - Testing rates are higher when tests are provided at multiple points for easily accessible testing with low friction e.g. walk-in centres requiring no completion of forms, conducted by health-care workers providing information and some support^{21,22}. Self-administered tests conducted at home with rapid results and without need for a lab offer potentially high accessibility but this will depend upon test distribution, effective communication about testing and its consequences and an accredited system for recording of results²³.
 - ii. Access provided by testing**
 - Requiring testing as a pre-condition of entry to a workplace, health or social care establishment, school, university campus or indoor event leads to high rates of testing²⁴. Such requirements may also discourage some with impacts on equity unknown.

Self-isolation and quarantine

8. Rates of quarantine following an infectious disease outbreak vary between 0% and 92.8%²⁵. Adherence is associated with knowledge of the disease and quarantine procedures, perceived risk of infection and provision of material and financial support^{25,26,27}.
9. Around 20% of those reporting symptoms of COVID-19 in England report fully self-isolating by staying at home²⁶. Rates of self-isolation from other members of a household is likely to be lower due to physical and other practical constraints²⁸. These rates may be even lower in those who are asymptomatic who receive a test positive result on mass testing given likely lower perceived risk of being infected.
10. Self-reported ability to self-isolate or quarantine is three times lower in those with incomes less than £20,000 or savings less than £100²³. Willingness to self-isolate is similarly high across all income and wealth groups. These findings are echoed in accounts during the current pandemic of those in low paid employment unable to self-isolate for financial reasons^{29,30}.

11. Based on observational evidence, provision of structural support seems highly likely to increase rates of self-isolation and quarantine although the effect size of each type of support, singly or together is unknown^{25,26,31}. This will require financial and other resources at levels that hitherto have not been made available in England as part of the existing NHS Test and Trace system. While paid sick leave has been judged an effective intervention to reduce transmission of SARS-CoV-2 across OECD countries, it does not include all workers such as those on casual or zero-hour contracts or gig workers³². In addition, payment level and duration vary considerably across countries with the level most often below gross pay.
12. Provision of financial support to safeguard incomes would likely have the single largest effect in achieving equitable testing – *i.e.* testing that benefits the social groups with fewest material and other resources as well as those with the most. This is based on descriptive analyses of COVID-19 and other pandemics and epidemics which clearly highlight the difficulties for those who are poorest to support themselves and their families without leaving their homes³³⁻³⁶. It also includes a study conducted in the current pandemic in which intentions to self-isolate in a general population sample in Israel increased from 57% to 94% when lost wages were to be compensated³⁷.
13. Below are four components of structured support highlighted in the literature cited above.
 - i. ***Provide information, social and clinical support proactively*** with daily contact using SMS or telephone offered, as part of *supportive accountability*³⁸. Coordinated provision of such support would need to be established for each programme of mass testing.
 - Information provided needs to include a clear rationale for self-isolation or quarantine including its effectiveness and the protocol to be followed.
 - Social and clinical support might include connecting to local schemes for social support such as COVID-19 health champions in Newham, London³⁹ or schemes set up for specific communities targeted for mass testing such as universities.
 - ii. ***Ensure sufficient supplies of food***, other essential goods, as well as support for chores or duties outside the home.
 - iii. ***Ensure employment protection*** for those needing to self-isolate or quarantine, including parents who may need to stay at home with a quarantined child *e.g.* following mass testing in schools.
 - Scotland has issued a fair work statement to guide employers and employees including ensuring: *No worker should be financially penalised for following medical advice*⁴⁰.
 - iv. ***Provide financial assistance*** for those financially affected by isolation or quarantine so they have no drop in weekly income
 - Such assistance would need to be rapid and easy to obtain.

- Amongst those in the UK entitled to statutory sick pay, this is frequently reported as insufficient both in amount and duration for many of the lowest paid to meet the basic expenses of daily living.
- In Scotland, recent changes to the Public Health etc. (Scotland) Act 2008 entitles people to financial compensation if they are subject to any loss having been specifically instructed to quarantine or restrict their work-related activities by public health officials⁴¹.

Enforcement

14. Without enforcement, some people behave sub-optimally during a pandemic, and indeed at other times²⁴. Without enforcement, some objective measures of mobility showed small increases over time during lockdown in the UK and elsewhere^{42,43,44}, self-reports of staying at home decreased⁴⁵, and self-reports of complete compliance with Government guidelines also decreased⁴⁷. Methods of enforcement include fines for violation – with and without electronic monitoring, denying entry to public spaces without electronically validated proof of being virus-free, and mandating self-isolation and quarantining in supervised facilities^{31,47}. The acceptability of these different methods varies across countries – with harsher measures more likely to be applied in authoritarian regimes – and context – with harsher measures more acceptable as a condition upon entry or reentry to a country than for those living in the country.
15. There is an absence of evidence regarding the effectiveness of any of these methods of other than presumed high effectiveness of mandated methods described above. The relative balance between providing support for self-isolation and enforcement is also unknown.
16. Evaluation of systems of enforcement deemed fair in the UK is warranted for mass testing programmes predicated on high rates of self-isolation and quarantine.

Impacts to be anticipated

i. Detecting higher rates of infection

- Mass population testing will detect higher rates of infection than current symptom-based testing^{48,49}. Depending on test performance some of those identified as infected will not be infected (false positives). The number asked to self-isolate could be reduced by follow-up diagnostic testing.
- Some employers and employees do not want to be self-isolating so are resistant to mass testing, as noted in internal memos regarding responses in Leicester in July 2020. Mitigation might require intervention by government agencies such as the Health and Safety Executive as well as government interventions – local and national – to ensure no loss of income to employees and to secure employment in those required to self-isolate

or quarantine. It should be noted, however, that this will could lead to significant loss of income to some employers particularly small and medium-sized enterprises (SMEs).

- Organisations participating in mass testing should anticipate this. For example, schools and universities need to plan teaching for those self-isolating or quarantined.

ii. Detecting higher rates of non-infection

- Mass population testing will result in more people being informed that they are currently not infected than is currently the case in the UK given most testing is restricted to those who are symptomatic.
- We are unaware of any evidence regarding the behavioural impact of receiving test-negative results from symptomatic or asymptomatic testing for SARS-CoV-2. Such a result has the potential to decrease behaviours to reduce risk of transmission if it is misunderstood as indicating a status that extends beyond the time of testing. It might, for example, delay seeking testing if symptoms appear after a test-negative result. If it is misunderstood to reflect no risk of infection it could reduce other risk-reducing behaviours such as hand hygiene⁵⁰.

iii. Impact on NHS Test and Trace symptomatic testing

- Tests used for mass population testing particularly in low prevalence settings and populations will result in higher false positives than symptomatic testing using lab-based PCR tests, resulting in more people misclassified as infected who are not. This may undermine public confidence in all testing.
- This might be mitigated by effective communications of the aims of the different testing programmes – mass testing vs symptomatic testing - and the meaning of test results from each. More generally, public understanding of testing and test results requires additional work. Many more people believe that they have already had COVID-19 than current data support, a belief that is associated with a perception of immunity to COVID-19 and reduced intention to engage in social distancing measures¹². Mass testing, and a high rate of false positive results, may exacerbate this, necessitating development and evaluation of interventions for pre-emption.

iv. Marginalisation and stigmatisation of communities

- Mass population testing will likely reveal higher rates of infection in areas of high deprivation where many in BAME groups reside. This has the potential to fuel existing racial tensions but also the potential to provide welcomed support depending on whether and how tensions are anticipated and testing is implemented^{51,52}. Mitigation measures include engaging local community leaders in co-production of guidance and

communications explaining the rationale for mass testing and how community members can support each other⁵².

v. Other possible impacts

- Given limited experience in the UK with mass testing requiring self-isolation and quarantine at scale, it would be prudent to set up systems to detect and manage unexpected consequences as they arise. This might comprise surveys and interviews with both those delivering and those to whom any testing is targeted.

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