What are the potential behavioural effects of reducing the duration of quarantine for contacts?

Key points

- There is no high-quality evidence regarding the effects of quarantine duration on adherence to quarantine. The points below relating to duration are based on indirect or weak evidence.

- Improving support for people who are asked to quarantine has a stronger evidence-base as an intervention. Reducing duration is most likely to have a beneficial effect on adherence if it is accompanied by improvements in support. [Medium confidence]

- We are not able to quantify the likely effect of a reduction in duration on adherence, either with or without additional support.

Potential positive behavioural outcomes

- A shorter duration is likely to lead to a reduction in the perceived and actual negative consequences of quarantine, including impact on finances, employment, work/education, colleagues, family, and mental wellbeing. This is likely to make adherence to quarantine more acceptable and sustainable for some people, especially for repeated episodes, because it would reduce the impact of quarantine on their lives and emotional wellbeing – but there is no evidence that this would increase adherence. [Medium confidence].
- Reduction in perceived negative consequences of quarantine might increase willingness to take up testing (on multiple occasions if necessary) and possibly to report contacts. [Low confidence].
- If a shorter period of quarantine makes it more feasible for national or local government, non-governmental organisations, or friends and family to provide adequate support (financial, practical and emotional) this would be likely to increase adherence. [Medium confidence].

Potential negative behavioural outcomes

- Reducing the length of quarantine could reduce perceptions of the risks of infection and the importance of quarantine in general, leading to lower adherence. [Low confidence].
- Reducing the length of quarantine could signal that there is no risk of spreading infection during the later period of infectivity, which could result in reduced adherence during this period and risky contacts with vulnerable people. [Low confidence].
- Minor, repeated changes to quarantine guidance risk undermining confidence and trust in guidance and in the official response in general, and may increase confusion about what is required [Medium confidence].
- Because the majority of reasons people give for non-adherence are unrelated to duration, reducing duration without also providing improved support may not increase adherence or testing uptake but would mean that adherent people would be obliged to resume risky behaviour sooner (such as attending work and education) [Medium confidence].

Implementation

- Simply reducing length of quarantine is unlikely to improve adherence substantially and could reduce adherence by undermining confidence in the need for and effectiveness of self-

isolation. A reduction in duration of quarantine is most likely to increase adherence if accompanied by:

- A communication campaign, founded on a strong evidence base, explaining that the new guidance is based on the latest scientific evidence showing that infectivity is greatest just before and after the onset of symptoms. To enable people to engage more effectively with infection control this campaign should also clarify what these symptoms are and that although the early part of quarantine is the highest risk period, for a longer period it is important to take extra care to reduce risk of transmission (e.g. social distancing, face coverings, ventilation, avoiding contacts with vulnerable people where possible).

- A comprehensive package of financial, practical, informational and emotional support for people in quarantine, including: rapid and easy access to full financial compensation for loss of earnings; immediate access to online shopping for necessities or assistance with shopping for those who do not use the internet; regular contact to provide emotional support and to identify and address other barriers to self-isolation (e.g. medical needs, caring responsibilities, exercise needs).

Supporting theory and evidence about duration of quarantine and self-isolation

There is no high quality direct behavioural evidence regarding the effect of duration of quarantine on adherence [1] [2], and so it is not possible to make statements about this with high confidence. The summary below reviews the evidence on which our recommendations are based. This considers factors influencing views of isolation (of cases) as well as quarantine (of contacts), as these are likely to be similar in many respects.

Likely effects of duration of self-isolation on acceptability and adherence

An Office for National Statistics survey of people asked to quarantine after international travel found that over half of travellers would be willing to pay for a test to reduce the period of quarantine from 14 to eight or nine days. However, only one in six of those people who would pay for a test said they would adhere more carefully to self-isolation for the shorter period (rising to one in four among people aged 18 to 20) [3]. A recent ONS survey of students found that 65% said they would quarantine for 14 days if someone in their household was symptomatic, while a further 19% would quarantine for 7 days only. A large experimental study in May [4] found that a four day duration scenario vs. an 11 day duration scenario slightly increased the proportion of people who said they would definitely self-isolate (84% vs. 76%). However, these intentions are higher than observed behaviour, and were assessed at a time when perceived risk was higher and a general “stay at home” requirement applied to the general population. Adherence to quarantine likely imposes less of a social, educational or occupational cost to many people when a general “stay at home” order is already in place [5]. The large intention-behaviour gap observed in relation to adherence to self-isolation suggests that the barriers are more likely to be due to difficulties implementing intentions rather than a lack of motivation [6].

Some of the key known reasons for non-adherence relate to perceptions of the necessity and benefits of quarantine [1]. A shorter quarantine period is not likely to alter these perceptions. Indeed, reducing the period of quarantine could reduce adherence if it is seen as signalling an implicit message that the risks relating to COVID-19 are lower and more short-lived than previously

believed. This is a particular risk at a time when the announcement of a vaccine may already be prompting relaxation of adherence due to a reduction in perceived risk from Covid. Moreover, there is already evidence of confusion about the guidance and procedures relating to TTI [1]. For example, in the latest wave of DHSC polling (data collected 26 to 28 October 2020, n=2043), only 47% of participants correctly identified that anyone who has symptoms of COVID-19 is eligible for a test. Knowledge about what you should do if a member of your household has symptoms of COVID-19 is suboptimal (see Annex 1), with 80% of people believing that you should stay at home. Of these people, only 73% report the correct duration for the quarantine period (14 days). If quarantine duration is reduced it will be essential to accompany this with an education campaign to support the new guidance, including a clear and credible explanation of the scientific rationale and consequences for infection control and countering any concerns among the public that a reduction in duration may be solely "for economic reasons" [7] [8]. Note that the explanation for the period of quarantine for contacts must be consistent with the explanation for the period of isolation for cases, in terms of the scientific understanding of patterns of infectivity. A broader point may also apply. Although evidence in this area is not entirely consistent [9], there is some evidence that confidence in the Government's ability to manage the pandemic is associated with increased adherence to a range of measures [10]. Repeated, seemingly minor changes to guidance may have a net negative effect if they are not well explained and degrade perceived competence (e.g. [11]). In summary, if duration is simply reduced without ensuring the public is fully aware of the reasons for a change in the guidance then confusion and scepticism about pandemic management may increase while risk perceptions and confidence in the necessity and effectiveness of quarantining could be reduced, resulting in less engagement with testing, tracing and isolating.

Overall, this evidence suggests that reducing the duration of quarantine is likely to increase acceptability and feasibility, but any direct positive effects on adherence are likely to be modest. We defer to SPI-M as to whether a modest impact on adherence to quarantine and / or uptake of testing is sufficient to balance any risk associated with a decrease in the duration of quarantine. However, if duration of quarantine is reduced without an effective education campaign to explain why and how this can be done safely then a negative impact on adherence is possible.

Practical, social, financial and emotional barriers to self-isolation

Survey and qualitative evidence suggests that three major reasons for non-adherence are: worries about financial impact; practical problems such as needing to obtain food and supplies; and emotional factors such as distress or boredom [2]. Such problems are likely to become more pressing as time goes on, and may be decreased by shorter periods of quarantine. However, they can still affect adherence to a short quarantine period if they are not addressed.

A previous paper by SPI-B has set out the evidence base for the impact of financial, practical and emotional barriers on someone's ability to adhere to either quarantine or isolation [7]. Financial considerations have been reported in several studies as a barrier to self-isolation. For example, the CORSAIR study, which is based on DHSC polling data, found associations between a composite measure of financial hardship and decreased adherence to full self-isolation among people with symptoms of COVID-19 [9]. This does not imply a reduced desire to self-isolate among participants who are struggling financially, but rather a reduced ability to self-isolate. In one early COVID-19 study in the UK, while willingness to self-isolate was high across all income groups, reported ability to self-isolate was three times lower in those with incomes less than £20,000 or savings less than £100 [12]. Intentions to self-isolate in a general population sample in Israel increased from 57% to 94% when lost wages were to be compensated [13]. It is likely that improving adherence to quarantine can be achieved by ensuring that it will not impact negatively on someone's income or

their employment, in the short or longer term. While additional support of £500 has been offered, this is currently available to only one worker in eight [14].

While necessary to maximise adherence, financial support is not sufficient to remove all barriers to quarantine. Practical problems are commonly reported. For example, taking children to school (where household quarantine is not required), shopping for food, caring for vulnerable relatives and similar requirements can all force people to break quarantine. In the large experimental study in May [4], 20% of respondents said they definitely would not self-isolate at all. The most common reason given for intending to breach self-isolation was shopping for essentials; caring responsibilities and the need to work were also common reasons. Shopping for essentials was also a major reason given for reporting breaching self-isolation in a study of people who had symptoms that meant they should have been self-isolating [15], in the ONS survey of people quarantining following travel [3], and in the CORSAIR study [9]. Shopping for essentials may be most likely immediately after someone has been asked to enter self-isolation, with 24% of people reporting making trips out during this initial period [16]. Proactive outreach to people who are quarantining in order to identify why they might need to leave home and provide support to resolve any practical issues would reduce non-adherence for these reasons. Receiving support from outside the home is associated with higher adherence to self-isolation [15]. There is evidence that regular personal contact to provide 'supportive accountability' improves adherence in other health contexts [17] [18], and can be considered an acceptable form of 'gentle enforcement' [19]; for example, advice together with practical and emotional support could be provided daily by phone or in person visits if necessary.

Emotional support will be required by some. There is consistent evidence that quarantine can be distressing [20] and some evidence that negative emotions including feeling depressed, anxious or bored are associated with poor adherence [2]. Interventions that reduce the negative emotional impact of quarantine may improve adherence. There is evidence that during lockdown being allowed to leave the home for outdoor exercise was associated with improved mental health and wellbeing [21, 22]. Exercise is one of the most common reported reasons for leaving the home during the quarantine period: an unpublished secondary analysis of data reported by Smith et al. [14] suggests that 52.5% of survey respondents with symptoms in their household during early May reported having left home in the past 24hrs for exercise. To reduce the emotional barriers to self-isolation, it might be helpful to advise that leaving the home for outdoor exercise could be permitted after the first few highest infectivity risk days provided it is done safely (i.e. for a limited period with 2 metres social distancing at all times unless wearing a mask). While a risk is that such advice could undermine the simple 'stay at home' message, prohibition of activities that people are aware are low risk (such as exercising outside without any contact) risks reducing the acceptability and credibility of self-isolation guidance, especially if strictly enforced. There is good evidence that positive support for adherence will be more effective than strict enforcement, which is likely to lead to disengagement with the TTI system [23].

While support is very likely to improve adherence, the precise combination of financial, practical and emotional support that is needed should reflect the specific challenges faced by different population groups in adherence. For example, previous SPI-B work on adherence in young people [24] identified that provision of resources, such as mobile data, to reduce social isolation could be useful; in contrast, support with childcare or vulnerable relatives may be more relevant for adults with caring responsibilities.

There is qualitative evidence [25] that parents and teachers believe that uptake of testing will be decreased by the negative consequences for the individual of having to self-isolate, including needing to work or attend school. There is also evidence from this study that concerns about the

impact of quarantine on others (e.g. work colleagues) reduces motivation and social norms for testing. More generally, people are more likely to attend work when ill if they perceive that their absence is having a negative impact on team-mates, and there is evidence that quarantine is putting strain on many employers, especially hospitals and care-homes where large numbers of staff have to quarantine repeatedly [26]. This barrier might be reduced if the impact on others was reduced by a shorter duration of quarantine.

Testing for release

There is interest in the potential use of testing for early release from quarantine, or to avoid the need for quarantine. Testing for release could be particularly useful for reducing the impact of quarantine in settings where there are high levels of exposure to contacts resulting in staffing shortages, such as healthcare workers, care workers and teachers. In these contexts, safely reducing the period of quarantine could make staff more willing to engage with TTI if this meant that staff shortages were less acute and the impact of quarantine reduced. However, the risks, barriers and potential benefits of testing are heavily dependent on the target population, the feasibility of repeat testing with rapid test results, and the likely number of false negative and positive results. There is already evidence that concerns about these issues are undermining intention to engage with TTI. For example, people may be concerned that a test to release from quarantine near the end of the period might prove positive and thus extend their quarantine period. Once the precise parameters for effective tracing are established it will be possible to consider the likely effects on acceptability and adherence. Collection of PPI, survey and qualitative feedback on proposed testing regimes is required to provide an evidence base.

Evaluation

Evaluation of the NHS TT system is essential. Unless we know what does and does not work, we cannot improve. Evaluation should therefore be viewed as an integral part of Test and Trace, with results being published quickly in order to continuously improve the system, public confidence and to obtain more input from the academic community.

If any changes to the system are considered, including changes to the duration of quarantine, then the design of an evaluation of the impact of that change should also be considered at the same time. Seeing evaluation as a 'bolt on' activity to be considered only after an intervention has been rolled out will lead to a rushed, suboptimal design, poor data, missed opportunities, and an inability to use an evidence-based approach to improving the system.

References

[1] R. Webster, S. Brooks, L. Smith, L. Woodland, S. Wessely and G. Rubin, "How to improve adherence with quarantine: rapid review of the evidence," *Public Health,* vol. 182, pp. 163-169, 2020.

[2] SPI-B, "Impact of financial and other targeted support on rates of self-isolation or quarantine," 16 September 2020. [Online]. Available: https://www.gov.uk/government/publications/spi-b-impact-of-financial-and-other-targeted-support-on-rates-of-self-isolation-or-quarantine-16-september-2020.

[3] Office for National Statistics, *Non-Exempt International Arrivals: Self-Isolation Behavioural Survey,* 15 October 2020.

[4] Behavioural Insights Team, *Willingness to comply with self-isolation requests,* 27 May 2020.

[5] A. Hodson, L. Woodland, L. Smith and G. Rubin, "Parental perceptions of COVID-19-like illness in their children," *medRxiv,* 2020.

[6] C.-Y. Lin, V. Imani, N. Majd, Z. Ghasemi, M. Griffiths, K. Hamilton, M. Hagger and A. Pakpour, "Using an integrated social cognition model to predict COVID-19 preventive behaviours," *British Journal of Health Psychology,* vol. 25, pp. 981-1005, 2020.

[7] J. P. Reynolds, K. Stautz, M. Pilling, v. d. L. S. and T. Marteau, “Communicating the effectiveness and ineffectiveness of government policies and their impact on public support: a systematic review with meta-analysis,” *Royal Society Open Science,* vol. 7, no. 1, 2020.

[8] SPI-B, “Easing restrictions on activity and social distancing - comments and suggestions,” 1 April 2020. [Online]. Available: https://www.gov.uk/government/publications/spi-b-easing-restrictions-on-activity-and-social-distancing-comments-and-suggestions-1-april-2020.

[9] L. Smith, H. Potts, R. Amlot, N. Fear, S. Michie and J. Rubin, “Adherence to the test, trace and isolate system: results from a time series of 21 nationally representative surveys in the UK (the COVID-19 Rapid Survey of Adherence to Interventions and Responses [CORSAIR] study),” *medRxiv,* 2020.

[10] L. Wright, A. Steptoe and D. Fancourt, “What predicts adherence to COVID-19 government guidelines? Longitudinal analyses of 51,000 UK adults,” *medRxiv,* 2020.

[11] B. Duffy, D. Allington, K. Beaver, C. Meyer, V. Moxham-Hall, G. Murkin, J. Rubin, G. Skinner, L. Smith, L. Strang and S. Wessely, “Coronavirus: growing divisions over the UK,” 2020. [Online]. Available: https://www.kcl.ac.uk/policy-institute/assets/coronavirus-growing-divisions-over-uk-government-response.pdf.

[12] C. Atchison, L. Bowman, C. Vrinten, R. Redd, P. Pristera, J. Eaton and H. Ward, “Perceptions and behavioural responses of the general public during the COVID-19 pandemic: A cross-sectional survey of UK Adults,” *medRxiv,* 2020.

[13] M. Bodas and K. Peleg, “Self-Isolation Compliance In The COVID-19 Era Influenced By Compensation: Findings From A Recent Survey In Israel,” *Health Affairs,* vol. 39, no. 6, pp. 936-941, 2020.

[14] Resolution Foundation, “Sorting it out: The Chancellor moves to fix the Job Support Scheme,” 22 October 2020. [Online]. Available: https://www.resolutionfoundation.org/publications/sorting-it-out/.

[15] L. Smith, R. Amlôt, H. Lambert, I. Oliver, C. Robin, L. Yardley and G. Rubin, “Factors associated with adherence to self-isolation and lockdown measures in the UK: a cross-sectional survey,” *Public Health,* vol. 187, pp. 41-52, 2020.

[16] DHSC, *Isolation compliance: Analysis of RCT control arm data.*

[17] D. Mohr, P. Cuijpers and K. Lehman, “Supportive Accountability: A Model for Providing Human Support to Enhance Adherence to eHealth Interventions,” *Journal of Medical Internet Research,* vol. 13, no. 1, 2011.

[18] M. Rothstein and M. Talbott, “Encouraging Compliance With Quarantine: A Proposal to Provide Job Security and Income Replacement,” *American Journal of Public Health,* vol. 97, pp. S49-S56, 2007.

[19] I. Erev, O. Plonsky and Y. Roth, “Complacency, panic, and the value of gentle rule enforcement in addressing pandemics,” *Nature Human Behaviour,* vol. 4, p. 1095–1097, 2020.

[20] S. Brooks, R. Webster, L. Smith, L. Woodland, S. Wessely, N. Greenberg and G. Rubin, “The psychological impact of quarantine and how to reduce it: rapid review of the evidence,” *Lancet,* vol. 395, no. 10227, 2020.

[21] R. Brand, S. Timme and S. Nosrat, “When Pandemic Hits: Exercise Frequency and Subjective Well-Being During COVID-19 Pandemic,” *Frontiers in Psychology,* vol. 11, p. 2391, 2020.

[22] J. Faulkner, W. O'Brien, B. McGrane, D. Wadsworth, J. Batten, C. Askew, C. Badenhorst, E. Byrd, M. Coulter, N. Draper, C. Elliot, S. Fryer, M. Hamlin, J. Jakeman, K. Mackintosh, M. McNarry, A. Mitchelmore and D. ... Lambrick, “Physical activity, mental health and well-being of adults during early COVID-19 containment strategies: A multi-country cross-sectional analysis,” *medRxiv,* 2020.

[23] SPI-B Policing & Security Subgroup, “Assessing the value of an Enforcement based approach to Covid,” Available from the SPI-B Secretariat., 21 September 2020.

[24] SPI-B, “Increasing adherence to COVID-19 preventative behaviours among young people,” 22 October 2020. [Online]. Available: https://www.gov.uk/government/publications/spi-b-increasing-adherence-to-covid-19-preventative-behaviours-among-young-people-22-october-2020.

[25] A. Lorenc, J. M. Kesten, J. Kidger, R. Langford and J. Horwood, “Reducing Covid-19 risk in schools: a qualitative examination of staff and family views and concerns,” *medRxiv,* 2020.

[26] R. Webster, R. Liu, K. Karimullina, I. Hall, R. Amlôt and G. Rubin, “A systematic review of infectious illness Presenteeism: prevalence, reasons and risk factors,” *BMC Public Health,* vol. 19, 2019.

[27] G. Rubin, L. Smith, G. Melendez-Torres and L. Yardley, “Improving adherence to 'test, trace and isolate',” *Journal of the Royal Society of Medicine,* vol. 113, no. 9, pp. 335-338, 2020.

[28] NHS Test and Trace, “Weekly statistics for NHS Test and Trace (England) and coronavirus testing (UK): 22 October to 28 October,” [Online]. Available: https://www.gov.uk/government/publications/nhs-test-and-trace-england-and-coronavirus-testing-uk-statistics-22-october-to-28-october/weekly-statistics-for-nhs-test-and-trace-england-and-coronavirus-testing-uk-22-october-to-28-october#table-8.

Annex 1. Beliefs about government advice if a household member is symptomatic.

DHSC/BMG polling, data collected 26 to 28 October 2020, n=2043

Belief	**N (%) who think it is true**
Should stay at home (isolate)	1627 (79.6)
Can go out for a walk or some other exercise	536 (26.2)
Can go out for a medical need, or to donate blood	515 (25.2)
Can go out to spend time outdoors for recreational purposes (including to sit in parks etc)	462 (22.6)
Can go to the shops for groceries/pharmacy	457 (22.4)
Can go out if you're wearing a face covering	407 (19.9)
Can go out if your household member's symptoms go away	363 (17.8)
Can go out to work if you cannot work from home	349 (17.1)
Can go to the shops for things other than groceries/pharmacy	342 (16.7)
Can go out to help or provide care for a vulnerable person	314 (15.4)
Can go out to meet up with friends and/or family that you don't live with, outdoors	271 (13.3)
Can go out if your household member's symptoms are mild	216 (10.6)
Can go out to meet up with friends and/or family that you don't live with, indoors	205 (10.0)

People who selected that you should stay at home (isolate) were asked how long they think people are required to stay at home and isolate from when their household member's symptoms started. Answers ranged between 1 and 45 days: 73% of people reported that you should isolate for 14 days [correct answer], 10% reported that you should isolate for 10 days, and 14% reported that you should isolate for 7 days.