



Bach Habersaat, K., Betsch, C., Danchin, M., Sunstein, C. R., Böhm, R., Falk, A., Brewer, N. T., Omer, S. B., Scherzer, M., Sah, S., Fischer, E. F., Lewandowsky, S., Butler, R., & al., E. (2020). Ten considerations for effectively managing the COVID-19 transition. *Nature Human Behaviour*, 2020. <https://doi.org/10.1038/s41562-020-0906-x>

Peer reviewed version

Link to published version (if available):
[10.1038/s41562-020-0906-x](https://doi.org/10.1038/s41562-020-0906-x)

[Link to publication record in Explore Bristol Research](#)
PDF-document

This is the author accepted manuscript (AAM). The final published version (version of record) is available online via Nature Research at <https://www.nature.com/articles/s41562-020-0906-x>. Please refer to any applicable terms of use of the publisher.

University of Bristol - Explore Bristol Research

General rights

This document is made available in accordance with publisher policies. Please cite only the published version using the reference above. Full terms of use are available: <http://www.bristol.ac.uk/red/research-policy/pure/user-guides/ebr-terms/>

1 **Ten considerations for effectively managing the COVID-19 transition**

2

3 Katrine Bach Habersaat^{*†1}

4 Cornelia Betsch^{*2}

5 Margie Danchin³

6 Cass R. Sunstein⁴

7 Robert Böhm⁵

8 Armin Falk⁶

9 Noel T. Brewer⁷

10 Saad B. Omer⁸

11 Martha Scherzer¹

12 Sunita Sah⁹

13 Edward F. Fischer¹⁰

14 Andrea E. Scheel¹

15 Daisy Fancourt¹¹

16 Shinobu Kitayama¹²

17 Eve Dubé¹³

18 Julie Leask¹⁴

19 Mohan Dutta¹⁵

20 Noni E MacDonald¹⁶

21 Anna Temkina¹⁷

22 Andreas Lieberoth¹⁸

23 Mark Jackson¹⁹

24 Stephan Lewandowsky²⁰

25 Holly Seale²¹

26 Nils Fiethe¹

27 Philipp Schmid²²

28 Michele Gelfand²³

29 Lars Korn²

30 Sarah Eitze²

31 Lisa Felgendreff²

32 Philipp Sprengholz²

33 Cristiana Salvi¹

34 Robb Butler¹

35 1 WHO Regional Office for Europe, Insights Unit, Marmorvej 51, DK-2100 Copenhagen, Denmark
36 2 University of Erfurt, Nordhäuser Straße 63, Erfurt, Germany
37 3 The University of Melbourne and Murdoch Children’s Research Institute, Royal Children’s Hospital,
38 Victoria, Australia
39 4 Harvard University, Cambridge, Massachusetts, USA
40 5 Department of Psychology, Department of Economics and Copenhagen Center for Social Data Science
41 (SODAS), University of Copenhagen, Øster Farimagsgade 2A, DK-1253 Copenhagen, Denmark
42 6 University of Bonn and Institute on Behavior and Inequality (briq), Bonn, Germany
43 7 Department of Health Behavior, Gillings School of Global Public Health and Lineberger
44 Comprehensive Cancer Center, University of North Carolina, Chapel Hill, North Carolina, USA
45 8 Yale Institute for Global Health, Department of Internal Medicine (Infectious Diseases), Yale School of
46 Medicine, Department of Epidemiology of Microbial Diseases, Yale School of Public Health, Yale
47 School of Nursing, New Haven, Connecticut, USA
48 9 Johnson School of Management, Cornell University, Ithaca, New York, USA
49 10 Vanderbilt University, Nashville, Tennessee, USA
50 11 Department of Behavioural Science and Health, University College London, United Kingdom
51 12 Department of Psychology, University of Michigan, Ann Arbor, Michigan, USA
52 13 Université Laval, Département d’anthropologie, Québec, Canada
53 14 Faculty of Medicine and Health, University of Sydney, Australia
54 15 Center for Culture-Centered Approach to Research and Evaluation (CARE), Massey University,
55 Aotearoa New Zealand
56 16 Department of Paediatrics, Dalhousie University, Halifax, Canada
57 17 Department of Sociology, European University of St. Petersburg, Russian Federation
58 18 Danish School of Education (DPU) & Interacting Minds Center (IMC), Aarhus University, Denmark
59 19 Director, Wellcome Centre for Cultures and Environments of Health, University of Exeter; Co-
60 Director, WHO Collaborating Centre on Culture and Health, University of Exeter, United Kingdom
61 20 University of Bristol and University of Western Australia
62 21 School of Public Health and Community Medicine, University of New South Wales, New South
63 Wales, Australia
64 22 Department of Psychology, University of Erfurt, Erfurt, Germany
65 23 Department of Psychology, University of Maryland, Maryland, USA
66
67 * shared first authorship
68 †Corresponding author: habersaatk@who.int

69 **Abstract**

70 Governments around the world have implemented measures to manage the transmission of coronavirus
71 disease 2019 (COVID-19). While the majority of these measures are proving effective, they have a high
72 social and economic cost, and response strategies are being adjusted. The World Health Organization
73 (WHO) recommends that communities should have a voice, be informed and engaged and participate in
74 this transition phase. We propose ten considerations to support this principle: (1) implement a phased
75 approach to a ‘new normal’; (2) balance individual rights with the social good; (3) prioritise people at
76 highest risk of negative consequences; (4) provide special support for healthcare workers and caring staff;
77 (5) build, strengthen and maintain trust; (6) enlist existing social norms and foster healthy new norms; (7)
78 increase resilience and self-efficacy; (8) use clear and positive language; (9) anticipate and manage
79 misinformation and (10) engage with media outlets. The transition phase should also be informed by real-
80 time data according to which governmental responses should be updated.

81 The rapid escalation and global spread of coronavirus disease 2019 (COVID-19) has prompted
82 governments to implement policies and measures to manage virus transmission, which has given health
83 systems time to prepare and mitigate the impact of the pandemic. While the majority of these measures
84 are proving effective, they have a high social, psychological¹ and economic cost and are, therefore, not
85 sustainable. Some countries and smaller jurisdictions are entering a phase of *transition* during which a
86 ‘de-escalation of global actions may occur, and reduction in response activities or movement towards
87 recovery actions by countries may be appropriate, according to their own risk assessments’² (p. 14). This
88 transition has challenges. Until a vaccine or effective treatment becomes available, public behaviour and
89 adherence to national and sub-national response strategies—notably social and physical distancing
90 measures (SPDM)—will continue to be key measures for controlling the virus. One of the six key criteria
91 that the World Health Organization (WHO) Regional Office for Europe³ have defined for the transition is
92 that communities should have a voice and be aware of and engaged in the transition process. We aim to
93 substantiate this principle with available evidence and expert advice.

94 95 **Unwanted scenarios**

96 At worst, a poorly timed and badly managed transition threatens the gains that each nation has
97 collectively achieved—potentially with high social and economic costs⁴⁻⁶ (5: preprint without peer-
98 review). Historical evidence from the 1918 influenza pandemic shows that a second wave of infection
99 can follow the removal of SPDM and lockdowns^{7,8}. Each country’s government can apply lessons learnt
100 from experience and analyse the current situation to anticipate potential unwanted scenarios and plan
101 mitigation measures. These scenarios are likely to vary depending on cultural context. However, in
102 general, the following scenarios and situations should be considered.

103 104 *A continuum of reactions*

105 At one end of the continuum of public responses to the pandemic is a decline in feelings of fear and
106 threat. A lack of perceived risk (e.g. due to declining cases or psychological adjustment to the new
107 situation) can cause decreased adherence to measures⁹ (preprint with internal peer-review) such as SPDM.
108 Moreover, people’s desire to reduce loneliness as soon as possible after a period of prolonged enforced
109 isolation may be strong, and the loosening of response measures might seem like standing in front of a
110 rich buffet after a diet or period of fasting¹⁰ (preprint without peer-review). Just as we might be tempted to
111 binge eat, our craving to socialise may grow with each day of the pandemic. At the extreme end of the
112 continuum of reactions, distrust of authorities, conspiracy thinking or reactance (anger due to restrictions)
113 may lead to social movements against SPDM norms and policies and a rise in pro-social closeness and
114 interaction. These reactions may be underpinned by messages that question the appropriateness of

115 government pandemic measures, which can increase distrust among broader segments of the population.
116 This scenario is not dissimilar to events and patterns related to vaccination¹¹⁻¹³. In addition, specific
117 population groups may lack the capability to continue adhering to restrictions and recommendations.
118 These groups may include youth, people with anxiety and other mental health disorders, people who lack
119 social support structures, financially disadvantaged groups, the homeless, indigenous populations, mobile
120 populations, people with chronic illness, people experiencing abuse or domestic violence, people living in
121 long-term care facilities and the persons who care for them and healthcare workers. People with lower
122 health literacy may face additional difficulties when navigating these challenges¹⁴. Conversely, some
123 people may be overly cautious due to fear and worry¹⁵ and may continue to over-implement restrictions¹⁶,
124 avoid supportive social interactions and delay seeing health care providers for potentially life-saving
125 measures, such as vaccinations or check-ups.

126

127 ***Uncertainty and lack of clarity***

128 As response strategies are continuously adjusted, it is likely that debates in the political and public
129 spheres related to unresolved dilemmas or the appropriateness of the implemented measures will increase.
130 How measures are implemented can fluctuate between what scholars refer to as societal tightness (e.g.
131 having strict rules and punishing deviance) and societal looseness (e.g. having more permissive rules and
132 lax punishments)^{17,18} (18: preprint without peer-review). Moreover, the transition process is likely to be
133 bidirectional and to require continuous adjustment³, and predictability will be challenging due to
134 uncertainty regarding the evolution of the outbreak. People will need to navigate these adjustments and
135 the lack of predictability, as well as complex and ambiguous messages (e.g. see some friends but not too
136 many friends) and possibly competing demands from the social and cultural environment regarding social
137 interaction^{19,20}. Collectively, these situations may result in individuals developing idiosyncratic
138 interpretations of restrictions as a coping strategy²¹.

139

140 ***Stigma and discrimination***

141 Disease can evoke fear and motivate people to separate themselves from infected individuals by
142 stigmatising them²²⁻²⁴. Examples include the stigmatization of gay men as an early response to AIDS²⁵
143 and of ‘Typhoid Mary’ (Mary Mallon) in the early twentieth century. The latter was apprehended by
144 authorities in Manhattan for spreading typhoid via her work as a cook, which caused many deaths²⁴. In the
145 current situation, certain population groups (e.g. health workers or certain ethnic groups) in some
146 countries may be perceived and branded as virus transmitters^{26,27}. COVID-19 may also become associated
147 with unhygienic or careless practices. This thinking could increase the mental distress and anxiety of
148 people who are infected²⁸ (preprint without peer-review) and reduce compliance with regard to testing

149 and engaging in the contact tracing process²⁹. Moreover, individuals who are at higher risk of severe
150 illness (and their families) may be advised to continue strict compliance with restrictions (e.g. working
151 from home). These individuals may be exposed to new forms of stigma, blame or discrimination as
152 societal expectations shift, especially in contexts where legal terminology is unclear.

153

154 **Ten considerations**

155 Avoiding these potential unwanted scenarios calls for careful planning and consideration of the
156 perspectives and engagement of populations³ and should be informed by evidence and expert advice from
157 the social and behavioural sciences and medical humanities. To support a key WHO criterion for the
158 transition (that communities should have a voice, be informed, engaged and participate), we propose ten
159 considerations for governments (Figure 1). Consideration 1 relates to the central idea that communities
160 must be aware that there will be no going back to normal but a stepwise approach to a ‘new normal’. The
161 other nine considerations relate to giving communities a voice (Considerations 2 to 4), engaging them in
162 the transition (Considerations 5 to 7) and informing them (Considerations 8 to 10)³. These considerations
163 are intended to support authorities in tailoring response strategies that will be accepted by the population
164 and priority target groups and that are likely to be effective^{3,11,30,31}.

165

166 To gather existing evidence and experiences of previous crises and brainstorm how this information could
167 support the transition phase, the first authors convened a group of experts, who reflect a diversity of
168 academic disciplines, domain expertise and familiarity with infectious diseases in general and COVID-19
169 in particular. This brainstorming was conducted online over three days. The first authors synthesised the
170 longlist of relevant issues into a shortlist, which was commented on by the full group in a shared
171 document. When a consensus was reached regarding the number of considerations and their respective
172 scope, the first authors drafted the sections and the experts added evidence and relevant references. The
173 entire group reviewed the final version. Thus, the resulting ten considerations, which are presented in
174 Figure 1 and explained with examples in Table 1, are based on expert advice and available evidence.
175 We suggest that, where possible, each consideration be monitored, informed and qualified using real-time
176 empirical evidence (sometimes referred to as ‘behavioural insights’). This could be achieved via
177 population surveys³², media and social media monitoring, ethnographic studies, COVID-19 hotline
178 monitoring and rapid assessment of specific population groups. While the following considerations have
179 been devised for COVID-19, they may also be helpful for addressing future unexpected events.

180

181 **Consideration 1**

182 *Implement a phased approach to a new normal*

183 At the centre of transition management is the assumption that an immediate return to normal will not be
184 possible. Instead, the transition process will take place in accordance with a phased approach whereby
185 society, systems and services are gradually re-opened, potentially in new forms. Each phase may involve
186 adjustments to restrictions and potential re-employment of previous stricter measures. During this
187 complex process, if people think that they are or soon will be returning to normal, their actions may
188 hasten the onset of a second wave of the outbreak⁴. Insights on how to mitigate this and maximise the
189 effectiveness of a phased approach to a new normal can be gained from studies that investigate how
190 people acquire new habits. These include studies on adjusting social norms in new student
191 populations^{33,34}, evaluating procedures and aids for prisoners returning to society³⁵, developing
192 pedagogical steps for small children who learn to stay in kindergarten³⁶ and normalising behaviours for
193 people with eating disorders³⁷. Different as they are, these studies all employ a step-by-step approach to
194 practising new behaviours in old environments whereby successfully acquiring habits is a function of
195 repetition³⁸⁻⁴⁰. In each case, the transition process is iterative. It involves detailed planning, setting goals
196 for each stage and stabilising, recapping and monitoring progress³⁹ and is underpinned by clear
197 communication. The COVID-19 transition process involves defining and communicating specific phases
198 in advance, while also accounting for the uncertainty of the outbreak evolution; preparing people for
199 planned adjustments to the response strategy; and transparently communicating what is known, what is
200 not known, and the criteria applied when making decisions.

201

202 **Consideration 2**

203 ***Balance individual rights with the social good***

204 The pandemic has prompted governments to temporarily introduce restrictions that infringe on individual
205 rights, such as freedom of movement, freedom of assembly and the right to practise religion in groups.
206 Public health approaches are often utilitarian in essence, which means that they maximise the overall
207 benefit for the population⁴¹. Willingness to act for the benefit of society is subject to cultural differences
208 and is more prominent in collectivist countries than in individualistic countries, where maximising
209 individual benefit is prioritised^{42,43}. These differences can also affect the level of acceptance of measures
210 and make it difficult to predict acceptance of a strategy in multiple regions or countries (e.g. wearing
211 masks to protect others may be well accepted in some Asian countries, but this does not necessarily
212 predict high willingness to wear masks in European countries). Difficult questions can also arise
213 regarding how to balance utilitarian values conducive to public health with respect for individual rights,
214 equity and personal dignity. For example, in certain limited cases, involuntary quarantine might be a
215 legitimate public health option⁴⁴⁻⁴⁶. However, efforts to protect public health should respect fundamental
216 rights, such as freedom of speech, privacy, due process of law, freedom from discrimination and freedom

217 of religion. Restrictions that are not regarded as justified may also jeopardise public support for the
218 pandemic response strategy and trust in authorities⁴⁷. Challenging cases, such as people exercising
219 freedom of speech to spread falsehoods that harm public health, may arise. Responses to these challenges
220 may vary from country to country. However, in general, the continued adjustment of the response
221 strategy, including decisions on which measures to adjust, lift or re-employ, should be maximally
222 respectful of rights and the foundational interest of human dignity
223 (<https://www.thehastingscenter.org/briefingbook/pandemic/>). Empirical evidence can inform this
224 decision-making by enabling authorities to understand norms and values, ensure the acceptability of
225 implemented and planned measures with respect to both individual and societal gains and detect shifts in
226 acceptance or barriers to measures^{32,48}.

227

228 **Consideration 3**

229 ***Prioritise people at highest risk of negative consequences***

230 The greatest negative impact of COVID-19 is felt amongst people who experience disadvantage,
231 especially poor and underserved groups⁴⁹ (see also
232 <https://www.un.org/development/desa/dspd/2020/04/social-impact-of-covid-19>). Evidence from other
233 infectious diseases contexts shows that socio-economic, equality-related disadvantages increase the risk
234 of negative psychological, mental and physical health, social, and economic consequences⁵⁰⁻⁵². It can be
235 assumed that groups who suffer these consequences will also encounter difficulties in adhering to
236 recommended behaviours in the long term. Therefore, mitigating the negative consequences for these
237 groups will result in individual as well as collective gain. Surveys and rapid assessments can help identify
238 priority groups who are likely to suffer the most. National response strategies could consider basic needs,
239 such as access to food, safe housing, health care, social care and employment and an understanding and
240 acknowledgement of the barriers faced by these different groups. Structural interventions can help support
241 recommended behaviours^{51,53,54}. For instance, a strategy for a staged return to work could consider a
242 return to work for people who are essential for the maintenance of the system⁵⁵ (preprint without peer-
243 review) or who face the least risk. Such a strategy could also include a needs assessment for new
244 measures to be implemented to prevent or alleviate negative repercussions for those who cannot return to
245 work, such as individuals and the families of individuals who are in COVID-19 risk groups. Working
246 closely with unions, worker collectives and organisations that serve people at the margins can help ensure
247 that the transition is structural.

248

249

250

251 **Consideration 4**

252 ***Provide special support for healthcare and caring staff***

253 Many healthcare workers were already under pressure before the pandemic for a variety of structural,
254 professional and personal reasons⁵⁶, and the current situation adds to this pressure. In the transition phase,
255 special concern for those who take care of high-risk groups, including people who work in health care and
256 public health, essential service workers and people who work in long-term care facilities, may be
257 necessary. Special training, guidelines and support services may be needed. Healthcare workers and
258 caring staff will need to continue protecting themselves from virus exposure and are likely to need further
259 emotional and psychological support to deal with the loss of colleagues or family members or post-
260 traumatic stress. Surveys and rapid assessments of healthcare and caring staff can provide insights into
261 their needs and how to respond to these needs⁵⁷. Access to workplace or home-based webinars⁵⁸ and the
262 development of structured information delivery during handovers and in-service meetings can support this
263 important group. This support could be combined with financial and symbolic rewards and public
264 recognition^{59,60}.

266 **Consideration 5**

267 ***Build, strengthen, and maintain trust***

268 By their nature, pandemics create inconsistency and uncertainty of a temporal, spatial and normative
269 nature⁶¹. Science changes rapidly, and decisions may be tailored to certain contexts and be based on many
270 considerations. This can produce inconsistencies between the risk of viral transmission and the
271 restrictions that exist. Trust in institutions (i.e. perceptions of them as competent, honest and
272 benevolent^{11,47}) influences risk perceptions⁶², helps people manage complexity and is crucial for
273 legitimising decisions made by authorities⁶³⁻⁶⁵. A strong sense of public trust is critical for harnessing
274 public cooperation and achieving the high rates of behaviour adherence necessary for pandemic
275 management. Therefore, actions and communication should aim to maintain or increase trust⁶⁶.
276 Transparent communication of what is known, what is not known, and what efforts are being taken to
277 learn more can contribute to building a sense of trust⁶⁷⁻⁶⁹. Knowing the rationale for decisions makes it
278 easier for people to internalise them into mechanisms of intrinsic motivation⁷⁰, so scientific advice to
279 governments should be transparent and not subject to political or government influence. Stakeholder
280 coordination also contributes to trust as it generates consistency and reinforcement of messages⁶⁷.
281 Governments can obtain the support of individuals or groups who enjoy high levels of trust to
282 communicate important messages or to reach more population groups in culturally and linguistically
283 diverse populations (e.g. religious leaders, former politicians and public figures from the arts, culture,
284 sports). Moreover, robust democratic infrastructures for community voices and pathways for these voices

285 to be translated into decision-making can help to maintain trust⁷¹. Open access to relevant information
286 expressed in culturally sensitive language can also contribute to a transparent system⁷². Community
287 engagement can demonstrate that the population is being heard and that their views are being considered
288 by decision-makers^{73,74} and promote trust. Surveys and other opportunities to monitor and detect possible
289 shifts in trust and understand how this may be related to new events or new restrictions can enable
290 decision-makers to respond accordingly.

291

292 **Consideration 6**

293 *Enlist existing social norms and foster healthy new norms*

294 Prevailing social norms shape people's behaviours^{75,76}. The rapid employment of risk-reduction strategies
295 in many countries during the pandemic has been made possible by appealing to longstanding norms and,
296 crucially, by creating new norms to support these strategies (e.g. not shaking hands and staying at home).
297 Social norms can also be invoked to support a transition, incremental or otherwise. Historical evidence
298 shows that norms can shift rapidly as a consequence of high-profile actions by authoritative
299 institutions^{77,78}. Once norms are established, they can be drawn upon for communication and to enforce
300 social compliance. Emphasising the social norms of a target group (e.g. health care workers, young
301 people, the elderly, newcomers, ethnic groups and religious communities⁷⁹) can increase adherence to
302 interventions and improve the effectiveness of communication measures^{30,80,81}. Meta-analytic evidence
303 also suggests that exposure to depictions of risky behaviour is positively correlated with risk-taking,
304 including exposure to risk-positive cognition and attitudes⁸². Thus, messages that privilege examples of
305 desired behaviours are likely to lead to higher adherence than those that emphasise punishment for
306 perceived breaches⁸³. When measures are adjusted or when they become more local, messages about what
307 is acceptable and appropriate behaviour may become mixed. Even people who wish to abide by messages
308 from public health authorities may feel pressure to comply with requests to violate the measures (and their
309 private preferences) from others in their immediate environment²⁰. Guidance on how to resist pressure to
310 participate in large social gatherings and oppose pressure to violate social norms or expectations can be
311 helpful (and can increase self-efficacy; see Consideration 7). Role models, influencers, religious leaders
312 and others who are trusted or in the public eye can help to strengthen prevailing social norms and support
313 new norms⁸⁴. In connection with consolidating positive social norms, emphasising the existence of a
314 broadly shared endeavour and social solidarity—a shared appreciation of interdependence among
315 individuals in a society—and acknowledging that strict rules are useful in the context of high societal
316 threats^{17,85} can be useful during mass emergencies that require collective action⁸⁶. Increasing people's
317 sense of social empathy towards those at highest risk⁸⁷ (preprint without peer-review) could be helpful in
318 the context of the COVID-19 transition phase for promoting pro-social actions, such as reducing crowds

319 and avoiding the hoarding of essential supplies (e.g. medical masks). Regular surveys and culturally
320 sensitive studies can be employed to understand social norms and expectations related to COVID-19,
321 detect shifts in these norms and possible new emerging issues (e.g. stigma, misperceptions and conspiracy
322 theories) and leverage this insight to plan and communicate the most socially acceptable measures.
323

324 **Consideration 7**

325 ***Increase resilience and self-efficacy***

326 Resilience has been defined as the ability to recover after a stressful period⁸⁸. Higher levels of resilience
327 among the public reduce the possible adverse effects of a crisis⁸⁹. Conflicting information, competing
328 social interests, internal motivational dynamics and threats to daily income and basic needs, such as food
329 or shelter, are demanding for individuals and communities¹⁹. In addition to ensuring the fulfilment of
330 basic needs, strengthening resilience^{90,91} can be valuable for crisis management. Recommendations for
331 strengthening resilience include accepting the inevitable (the pandemic has already had a substantial
332 impact on our societies, which may be alleviated but is not likely to end in the near future.); focusing on
333 positive gains (e.g. being able to see some friends again even if we cannot attend large parties); drawing
334 attention to progress (e.g. identifying strategies that have been working); measuring and attending to
335 people's day-to-day emotional states and well-being and improvements in public health; taking
336 responsibility (e.g. acting where possible); understanding our limitations (making changes that are
337 possible and accepting what is not changeable); reversing negative thoughts (focusing on learning rather
338 than on mistakes); knowing our strengths (highlighting past successes as individuals and communities and
339 strengthening people's sense of self-efficacy). In some settings, where basic needs are being met and
340 appropriate resources are available, resilience training can be conducted using apps, online programs or
341 large-scale media campaigns^{92,93}.

342
343 One response to fear caused by previously unimaginable adversity is to attempt to control the fear by
344 denying disturbing information and taking actions that are not consistent with individual or collective
345 interests^{94,95}. Such responses can cause non-compliance with public health recommendations; however,
346 they can be mitigated by emphasising *self-efficacy* (the belief that an action can be completed⁹⁶) and
347 *response efficacy* (the belief that an action can reduce a threat^{95,97}). Explaining what should be done (e.g.
348 regular handwashing with water and soap) and the reasons for doing it (e.g. soap breaks down fatty
349 membranes to destroy viruses and bacteria) can promote response efficacy⁹⁸. Making change as easy as
350 possible so that people understand the actions they should take to protect themselves and providing
351 feedback on these actions can increase self-efficacy⁹⁹. It can also increase health literacy, which is the
352 ability to acquire, understand and use health information. Given the high levels of complex, contradictory

353 and false information associated with this pandemic, health literacy is a critical issue, particularly for
354 population groups who experience disadvantage¹⁴. Studies show that feeling able to protect oneself
355 against COVID-19 and knowing about effective measures are predictors of protective behaviours^{97,100}
356 (100: preprint without peer-review). Strengthening self-efficacy and response efficacy in a manner that
357 reaches people with low health literacy can empower people to control and take ownership of their actions
358 and generate adherence to protective measures. Should it be necessary to reinstate such measures during
359 future waves of infection, people with high self-efficacy and response efficacy may be more willing to
360 resume such measures as they know the measures will protect them and they believe that they can adhere
361 to the measures.

362

363 **Consideration 8**

364 *Use clear and positive language*

365 Behavioural science emphasises the importance of ensuring clarity in language and reducing cognitive
366 load¹⁰¹. If people find new guidance confusing or difficult to understand, they might ignore it. Complex
367 guidance can create serious navigation problems. An emergency such as the COVID-19 pandemic is
368 characterised by uncertainty and clear guidance is needed. However, such guidance is often based on
369 uncertain evidence. Research has shown that acknowledging uncertainty does not undermine trust⁶⁹.
370 Furthermore, while a language of *crisis*, *panic* and *war* can increase risk awareness—which may be
371 needed—it can also cause anxiety, incite selfish or competitive reactions and undermine people’s sense of
372 collective support and care¹⁰². Hoarding behaviour, which has been seen in many countries, may be a
373 consequence of this rhetoric¹⁰³. Crisis language may also cause over-cautiousness among some people,
374 who, consequently, may not seek primary care or provide social support to people who need it. By
375 contrast, the use of gain-frame language to highlight the collective gains already achieved and the benefits
376 that could still be achieved may create more ownership and foster compliance with behavioural rules¹⁰⁴.
377 Building communication strategies that balance risk perception with risk assessment is also key for
378 aligning people’s perception of risk with scientific estimations of the risks¹⁰³. Some research suggests that
379 people are less willing to make sacrifices for others when the *benefits* are uncertain¹⁰⁵, so the benefits of
380 compliant behaviour should be made concrete and visible. Ownership of something makes it more
381 valuable to an individual (the endowment effect¹⁰⁶). Moreover, hedonic framing, which combines smaller
382 losses (e.g. the inconvenience of wearing masks) with larger collective or individual gains (e.g. being able
383 to see friends again), could increase public acceptance of ongoing restrictions¹⁰⁷. Therefore, the aim
384 should be to highlight the gains that can be made from engaging in target behaviours and activate the
385 internal moral compass that renders personal rewards less important than benefits to others^{102,108}.

386

387 **Consideration 9**

388 ***Anticipate and manage misinformation***

389 COVID-19 is the first global public health emergency to occur in the era of widespread use of social
390 media, the Internet and smartphones. The WHO has acknowledged the existence of an ‘infodemic’ in
391 addition to the pandemic. The term ‘infodemic’ refers to the availability of an overwhelming amount of
392 information, which can create confusion regarding which, if any, sources are trustworthy¹⁰⁹. Pre-
393 emptively exposing people to techniques that are often employed for misinformation and warning people
394 against misleading techniques can reduce their susceptibility to future falsehoods^{110,111} (110: preprint
395 without peer-review). This prebunking¹¹²⁻¹¹⁴ (or cognitive inoculation^{115,116}) activates resistance
396 mechanisms in the public and empowers people to assess the reliability of information¹¹¹. However, some
397 misinformation cannot be foreseen. Therefore, debunking approaches¹¹⁷, which counter widespread myths
398 and uncover why they are wrong¹¹⁸⁻¹²⁰, are also needed when misinformation is disseminated. Cognitive
399 inoculation may also be successful for priming the public for the transition phase. This involves
400 foreseeing the likelihood of widespread misinformation, explaining how people can manage this situation,
401 addressing and talking openly about the possible aversive effects of physical isolation, reassuring people
402 that these aversive effects are reversible and exploring how they can be addressed and mitigated. Pre-
403 empting future waves of the virus based on currently available evidence and clearly communicating the
404 potential continuous adjustment of restrictive measures may lay the foundation for greater acceptance.
405 Prebunking and debunking approaches (i.e. inoculating people against misinformation before spreads and
406 correcting misinformation after it appears) will also be needed if and when a COVID-19 vaccine becomes
407 available, as misinformation about this topic is likely to be disseminated.

408

409 **Consideration 10**

410 ***Engage with media outlets***

411 Studies have reported high levels of information-seeking during the COVID-19 pandemic¹²¹ (preprint
412 without peer-review). During previous outbreaks of other diseases, combined trust in both the government
413 and the media has been associated with increased preventive behaviours, such as hand-washing¹²². One
414 study revealed that social media information increased risk perception during an outbreak, while legacy
415 media, such as national television and broadsheet papers, increased proactive preventive behaviour¹²³. For
416 governments, media outlets are important influencers and critical channels for reaching the public.
417 Established news and online media outlets can alleviate discomfort during a crisis¹²⁴ (preprint without
418 peer-review), showcase appropriate behaviours¹²⁵ and provide helpful perspectives from trusted figures
419 (e.g. established social media influencers and medical professionals¹²⁶⁻¹²⁸). However, media consumption
420 can also cause stress and anxiety and spread misinformation¹⁰². Since the media can play a critical role in

421 communicating and balancing information and influencing public sentiment and discussion during a
422 public health crisis^{129,130}, the WHO has developed guidance on how authorities can work with the
423 media^{131,132}. A combined approach that targets legacy platforms, audience-specific and local outlets and
424 social media may be the most efficient¹³³. Particular groups may use, trust or feel represented by certain
425 media¹²³—which can be critical in a potentially increasingly polarised debate¹³⁴—and behavioural studies
426 stress the impact of communicating behavioural norms at a local level¹²⁵. Thus, governments can continue
427 to proactively reach out to a variety of media during the transition while respecting their independence
428 and highlighting their role and potential influence¹³⁵. Even if measures have not been implemented,
429 journalists and media can frame shared understandings and prime their audiences for the future using
430 strategies such as introducing important terminology¹³⁶ (e.g. ‘new normal’, ‘gradual changes’,
431 ‘adjustments’, ‘need for cooperation’). The following key messages may be employed: this is an
432 unprecedented situation; there may be changes to the strategy as we learn more; this is a solvable
433 situation; and greater restrictions may become necessary again in the event of a second or third wave.
434 Journalists and the media can support the framing of the transition phase as an all-of-society approach and
435 responsibly perform their important role by avoiding actions such as feeding confusion and blame and
436 reporting inconsistent messages, controversies, rumours, misinformation and speculation^{137,138}.

437

438 **Inform and qualify action with evidence from behavioural and cultural research**

439 To effectively manage the transition phase, the considerations outlined above should be adapted to
440 individual contexts¹³⁹. Thus, the process should be informed by a situation analysis and current evidence
441 from behavioural, social and cultural sciences applicable to the specific context (examples are provided in
442 Table 1) and be supported by engagement with communities. Continued cultural adjustment of the
443 response strategy fosters spaces for listening to the voices of diverse communities during the development
444 of behavioural strategies and the creation of support processes for sustaining behaviours^{72,79,140,141}. These
445 data can help us understand how people are experiencing, interpreting, responding to and accepting the
446 COVID-19 response and can inform the development of interventions and support the tailoring of
447 measures to subgroups of the population.

448

449 **Limitations**

450 Although we sought experts from different global regions and drew on research from around the globe,
451 we are aware that all of the experts except one expert live in high-income countries. Inevitably, their
452 fields of study and lived experiences have shaped the final report. Furthermore, some aspects may be
453 missing from one scientific perspective and over-emphasised from another perspective. However, these
454 limitations were weighed against the need to provide decision-makers with evidence in a very short time.

455 We also acknowledge that the considerations described in this paper are based on evidence from various
456 sources of literature, some of which relates to outbreaks, crises and pandemic situations and some that is
457 unrelated to these situations. The validity and reliability of the evidence from psychology (and other
458 fields) may be challenged as some studies have not been replicated^{142,143}. Moreover, most published
459 research in the field of ‘behavioural insights’ originates in Western, educated, industrialised, rich and
460 democratic countries¹⁴⁴, which makes generalising the results to other contexts difficult¹⁴⁵. These
461 limitations have caused some scholars to argue that this type of science should not inform crisis
462 response^{143,146} (146: preprint without peer-review). In this paper, however, we propose complementing
463 existing evidence (summarised here) with real-time data collected in specific situations and countries³².
464 This combination helps to interpret the newly generated evidence based on existing evidence and to
465 generate and select relevant questions and variables to perform ad-hoc crisis research. In no case should
466 scientific evidence provide decision-makers with a false sense of certainty as all evidence is surrounded
467 by the uncertainty inherent in every scientific process. However, the evidence will help guide thinking
468 and decision-making in a systematic way.

469

470 **Conclusion**

471 In sum, evidence from multiple sources allows us to better understand population perspectives, gauge
472 emotional responses and subjective experiences, anticipate unwanted scenarios, introduce mitigation
473 measures and plan for the most effective actions to improve public understanding and compliance.
474 Understanding how the pandemic and the restrictions imposed are impacting people’s everyday lives,
475 their social and mental health and their motivation and intentions to follow recommended practices is
476 critical for the sustained success of the pandemic response during the transition^{3,31} and will be a valuable
477 source for ensuring our preparedness for future pandemics.

478

479 **Acknowledgements**

480 The authors are grateful to Molly J. Crockett of Yale University and Lena Lerner of the University of
481 Erfurt for their valuable input. The authors are responsible for the views expressed in this article, which
482 do not necessarily represent the views, decisions or policies of the institutions with which they are
483 affiliated.

484

485 **Figure captions**

486

487 **Figure 1: Ten considerations for effectively managing the COVID-19 transition.** *Note:* The
488 considerations substantiate the WHO/Euro principle #6 ‘Communities have a voice, are informed,
489 engaged and participate in the transition’³ and were derived from an online expert consultation. The
490 considerations do not imply a temporal sequence and are interrelated just as listening to communities,
491 engaging with them and informing them are interlinked. The ten considerations are aimed at providing
492 suggestions to governments. The awareness that there will be no going back to normal but a stepwise
493 adaptation to a ‘new normal’ is in the centre of the transition process (#1). Giving communities a voice
494 (#2-4), engaging them in the transition (#5-7), and informing them in the best possible way (#8-10)³ can
495 help effectively manage the transition.

496

497

498

499 **Table 1: Examples of how to enrich the ten considerations with real-time data and further evidence**
 500 **and how to apply the evidence obtained to inform the transition phase**

Consideration	How behavioural and cultural research can be applied*	Action examples Action should always be informed by an analysis of the situation**
1) Implement a phased approach to a ‘new normal’	Conduct research to understand population acceptance and barriers to measures implemented or planned and employ this research in planning and communication	<ul style="list-style-type: none"> ● Plan a detailed transition: set goals for each phase with red, yellow and green signs for pandemic response adjustment scenarios and transparently communicate these goals ● Anticipate unwanted scenarios based on social, behavioural and cultural literature and previous crises in the country and prepare prevention and mitigation measures for these scenarios ● Provide tailored guidance to priority population groups as needed following segmentation
2) Balance individual rights with the social good	Use evidence from regular surveys, hotline monitoring, social media monitoring and qualitative ethnographic studies to understand prevailing norms and values and acceptability of implemented and planned measures and to detect shifts in acceptance or barriers to measures and be guided by this evidence in planning	<ul style="list-style-type: none"> ● Use existing research to identify elements of culture and history, social norms, beliefs and values and gather multi-disciplinary expert panels to provide input and insight; panels could include anthropologists, historians, social scientists and cultural studies specialists ● Focus messages on identified prevailing norms and values; for example, emphasise the substantial impact of measures on protecting the community, individual families and/or workers ● Consider fundamental issues regarding the individual versus the social good, privacy and protection of individual rights
3) Prioritise people at highest risk of negative consequences	Conduct research to understand implications for people at highest risk, their mental and physical health needs and possible emerging discrimination and stigma and apply this insight to inform action	<ul style="list-style-type: none"> ● Address basic needs and fundamental human rights, such as access to employment, education, housing, food and health care ● Prioritise people who are most severely affected, either mentally, physically or financially ● Ensure that prioritising certain groups will not increase stigma or discrimination and take action to prevent and/or decrease these effects ● Coordinate closely and engage in reciprocal communication with traditional and social media outlets, influencers and mediators who work with these groups
4) Provide special support for healthcare and caring staff	Conduct research to identify specific needs of healthcare and caring staff (e.g. related to working hours, childcare, stress and protective equipment) and respond to these needs	<ul style="list-style-type: none"> ● Express the gratitude of leadership and foster community support ● Provide guidance on the rights and entitlements of healthcare and caring workers ● Provide guidance on organising primary care and long-term care homes and supporting users in accessing them safely ● Support working from home and video-conferencing where possible ● Engage staff in protecting themselves and providing trusted public health advice to patients and the public ● Start planning for inclusion of epidemic management basics and communication with patients in core curricula of medical/nursing schools
5) Build, strengthen, and maintain trust	Conduct research to understand trust in specific institutions, spokespersons and influencers and to detect possible shifts in this area and how such shifts may be related to new events or new	<ul style="list-style-type: none"> ● Organise daily media briefings where trusted spokespersons, identified through population surveys, are clear, humble and empathetic and people feel part of the process instead of feeling as if they are being lectured ● Explain how insights from population surveys are being considered as the voices of populations

	restrictions; use this research to inform planning	<ul style="list-style-type: none"> • Acknowledge uncertainty, be transparent about unanswered questions and balance the need for clarity with acknowledgement of uncertainty about the evolution of the outbreak • Respect all voices and respond to all questions
6) Enlist existing social norms and foster healthy new norms	Conduct research to understand social norms and expectations related to COVID-19 and to detect shifts in these expectations and possible new emerging issues (e.g. stigma, misperceptions and conspiracy theories) and leverage this insight in communication and planning of the most socially acceptable measures	<ul style="list-style-type: none"> • Ensure that risk communication and community engagement occur to establish that measures are both scientifically accurate and acceptable by people • Engage citizens by providing community leaders with opportunities to co-create transition plans • Engage grassroots activists, local communities, university students, and volunteers in measures such as psychosocial support, helplines, support for infected people, phone-based contact tracing and message development • Work with influencers to amplify messages about the transition aimed at different population groups • Engage influencers and community leaders in sharing guidance on how to cope with competing interests • Coordinate across sectors; activities could include working with the arts and culture sector to fund or support COVID19-specific arts activities
7) Increase resilience and self-efficacy	Conduct research to understand the population's capability to continue to adhere to restrictions and recommendations, which may signal the need for adjustment to restrictions	<ul style="list-style-type: none"> • Continue to focus on public health advice regarding COVID-19, including hand and respiratory hygiene, and adjust messages in accordance with transition phase stages • Produce proactive advice about the importance of self-care, stress management, healthy habits, social interactions and prioritising rest, sleep and exercise, taking into account diversity in health literacy • Communicate the availability of individual and family support (e.g. education and schooling support, return to work support and guidelines related to alcohol/substance use, tobacco, weight/sedentary time, nutrition, stress, and safely accessing primary care) provided at national level or by the WHO • Engage with and support communities and organisations who work in the areas of domestic violence, child protection, temporary home offers, social isolation and other areas • Strengthen coping strategies for navigating competing interests (e.g. guidance on how to respond to expectations of friends and family regarding social interactions)
8) Use clear and positive language	Conduct research to understand general perceptions related to COVID-19 and trust in spokespersons and base strategies on these findings	<ul style="list-style-type: none"> • Communicate clearly and focus on the benefits and gains • Seek to communicate risk based on scientific evidence to prevent both under- and over-cautiousness among the public • Avoid using war language (e.g. war against COVID-19, the frontline response), which may increase stigma and undermine people's sense of collective support and care and lead to individualistic behaviours such as hoarding • Positive wording may include progress, advance, community, cohesion, improve, perspective, reasonable, resourceful, optimistic and generous • Refer to 'people who have been infected with COVID-19' rather than 'cases'
9) Anticipate and manage mis-information	Conduct research to identify general perceptions related to COVID-19 and misperceptions and myths	<ul style="list-style-type: none"> • Anticipate unwanted scenarios and gain insights from social, behavioural and cultural literature, including lessons that can be learned from previous pandemics and crises in the country • Advise people that they are likely to receive misinformation and inform them where they can access trustworthy facts

		<ul style="list-style-type: none"> • Communicate proactively regarding potential future waves of transmission and what these scenarios might entail
10) Engage with media outlets	Conduct research to understand and detect shifts in trust in spokespersons and the use of various media outlets within the population and sub-segments of the population; use this insight to plan interactions with the media	<ul style="list-style-type: none"> • Proactively reach out to media outlets to engage them as partners in the response, respect their independence and highlight their role and potential influence • Use the power of the media to alleviate discomfort from the pandemic; appeal to the media to avoid feeding fear, stress, confusion, polarisation and stigmatisation • Appeal to the media to present authoritative information and avoid confusion with speculations and misinformation

501 *Note:* The table provides examples and is not intended to be read as prescriptive guidance. The examples
502 in columns 2 and 3 were generated by applying the considerations to potential country contexts. Input was
503 suggested and preselected mainly by WHO/Euro staff and reviewed by all authors. * Various
504 opportunities to monitor and understand public sentiments, responses, behaviours and physical and
505 mental health reactions to the pandemic can be drawn upon, such as regular behavioural insight
506 surveys^{32,100,147-154} (148-154: preprints of study protocols without peer review), (social) media
507 monitoring¹⁵⁵, COVID-19 hotline monitoring, qualitative ethnographic studies, rapid assessments of
508 priority population groups, diary projects¹⁵⁶, virtual interviews and group discussions, ‘big data’ such as
509 individual location data (e.g. from mobile phones^{157,158}), data on consumer trends and data on use of
510 primary care. ** Examples of sources to be analysed include epidemiological, structural, cultural,
511 financial, political, health systems capacity-related data.

512
513
514
515

516 **References**

- 517 1. Brooks, S. K. et al. The psychological impact of quarantine and how to reduce it: rapid
518 review of the evidence. *Lancet* **395**, 912-920 (2020).
- 519 2. World Health Organization. *Pandemic Influenza Risk Management: A WHO guide to*
520 *inform and harmonize national and international pandemic preparedness and response* (World
521 Health Organization, 2017).
- 522 3. World Health Organization, Regional Office for Europe. Strengthening and adjusting
523 public health measures throughout the COVID-19 transition phases. Policy considerations for the
524 WHO European Region, 24 April 2020. [http://www.euro.who.int/en/health-topics/health-](http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020)
525 [emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-](http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020)
526 [guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/strengthening-and-](http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020)
527 [adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-](http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020)
528 [considerations-for-the-who-european-region,-24-april-2020](http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance/coronavirus-disease-covid-19-outbreak-technical-guidance-europe/strengthening-and-adjusting-public-health-measures-throughout-the-covid-19-transition-phases.-policy-considerations-for-the-who-european-region,-24-april-2020) (2020).
- 529 4. Anderson, R. M., Heesterbeek, H., Klinkenberg, D. & Hollingsworth, T. D. How will
530 country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* **395**,
531 931–934 (2020).
- 532 5. Atkeson, A. *What Will Be the Economic Impact of COVID-19 in the US? Rough*
533 *Estimates of Disease Scenarios*. <http://www.nber.org/papers/w26867.pdf> (2020)
534 doi:10.3386/w26867.
- 535 6. McKibbin, W. J. & Fernando, R. The global macroeconomic impacts of COVID-19:
536 seven scenarios. *SSRN* <http://dx.doi.org/10.2139/ssrn.3547729> (2020).
- 537 7. Radusin, M. The Spanish flu, part II: the second and third wave. *Vojnosanit. Pregl.* **69**,
538 917–927 (2012).
- 539 8. Tognotti, E. Influenza pandemics: a historical retrospect. *J. Infect. Dev. Countr.* **3**, 331–
540 334 (2009).
- 541 9. Betsch, C. et al. German COVID-19 Snapshot Monitoring (COSMO) - Welle 8
542 (21.04.2020). <http://dx.doi.org/10.23668/psycharchives.2883> (2020).
- 543 10. Okruszek, L., Aniszewska-Stańczuk, A., Piejka, A., Wiśniewska, M. & Żurek, K. Safe
544 but lonely? Loneliness, mental health symptoms and COVID-19. Preprint at:
545 <https://psyarxiv.com/9njps/> (2020).
- 546 11. WHO Europe. *Vaccination and Trust - How Concerns Arise and the Role of*
547 *Communication in Mitigating Crises* (World Health Organization, 2017).
- 548 12. Fairhead, J. *Vaccine Anxieties: Global Science, Child Health and Society*. (Routledge,
549 2012).
- 550 13. MacDonald, N. E. & SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy:
551 definition, scope and determinants. *Vaccine* **33**, 4161–4164 (2015).
- 552 14. Paakkari, L. & Okan, O. COVID-19: health literacy is an underestimated problem.
553 *Lancet Public Health* **5**, e249-e250 (2020).
- 554 15. McCarthy-Larzelere, M. et al. Psychometric properties and factor structure of the Worry
555 Domains Questionnaire. *Assessment* **8**, 177–191 (2001).
- 556 16. Sunstein, C. *Laws of Fear: Beyond the Precautionary Principle (The Seeley Lectures)*
557 (Cambridge University Press, 2005).
- 558 17. Gelfand, M. J. et al. Differences between tight and loose cultures: a 33-nation study.
559 *Science* **332**, 1100–1104 (2011).
- 560 18. Gelfand, M. et al. Cultural and institutional factors predicting the infection rate and
561 mortality likelihood of the COVID-19 pandemic. Preprint at <https://psyarxiv.com/m7f8a/> (2020).

- 562 19. Sah, S. Policy solutions to conflicts of interest: the value of professional norms. *Behav.*
563 *Public Policy* **1**, 177–189 (2017).
- 564 20. Sah, S. Why you find it so hard to resist taking bad advice. *The Los Angeles Times*
565 [https://www.latimes.com/opinion/story/2019-10-29/advice-neuroscience-psychology-social-
566 pressure-research](https://www.latimes.com/opinion/story/2019-10-29/advice-neuroscience-psychology-social-
566 pressure-research) (25 May 2020).
- 567 21. Stern, P. C. Contributions of psychology to limiting climate change. *Am. Psychol.* **66**,
568 303–314 (2011).
- 569 22. Jaramillo, E. Tuberculosis and stigma: predictors of prejudice against people with
570 tuberculosis. *J. Health Psychol.* **4**, 71–79 (1999).
- 571 23. Golden, J., Conroy, R. M., O’Dwyer, A. M., Golden, D. & Hardouin, J.-B. Illness-related
572 stigma, mood and adjustment to illness in persons with hepatitis C. *Soc. Sci. Med.* **63**, 3188–3198
573 (2006).
- 574 24. Leavitt, J. W. *Typhoid Mary: captive to the public’s health*. (Beacon Press, 2014).
- 575 25. Berridge, V. & Strong, P. *AIDS and contemporary history*. (Cambridge University Press,
576 2002).
- 577 26. Budhwani, H. & Sun, R. Creating COVID-19 stigma by referencing the novel
578 coronavirus as the ‘Chinese virus’ on Twitter: quantitative analysis of social media data. *J. Med.*
579 *Internet Res.* **22**, e19301 (2020).
- 580 27. Devakumar, D., Shannon, G., Bhopal, S. S. & Abubakar, I. Racism and discrimination in
581 COVID-19 responses. *Lancet* **395**, 1194 (2020).
- 582 28. Adom, D. & Adu Mensah, J. The psychological distress and mental health disorders from
583 COVID-19 stigmatization in Ghana. Preprint at <https://ssrn.com/abstract=3599756> (2020).
- 584 29. Fox, A. B., Earnshaw, V. A., Taverna, E. & Vogt, D. Conceptualizing and measuring
585 mental illness stigma: the mental illness stigma framework and critical review of measures.
586 *Stigma Health* **3**, 348–376 (2018).
- 587 30. Bavel, J. J. V. et al. Using social and behavioural science to support COVID-19
588 pandemic response. *Nat. Hum. Behav.* <https://doi.org/10.1038/s41562-020-0884-z> (2020).
- 589 31. Michie, S., van Stralen, M. M. & West, R. The behaviour change wheel: a new method
590 for characterising and designing behaviour change interventions. *Implement. Sci.*
591 <https://doi.org/10.1186/1748-5908-6-42> (2011).
- 592 32. Betsch, C., Wieler, L. H. & Habersaat, K. Monitoring behavioural insights related to
593 COVID-19. *Lancet* **395**, 1255–1256 (2020).
- 594 33. Abe, J., Talbot, D. M. & Gellhoed, R. Effects of a peer program on international student
595 adjustment. *J. Coll. Stud. Dev.* **39**, 539–547 (1998).
- 596 34. Smith, R. A. & Khawaja, N. G. A review of the acculturation experiences of international
597 students. *Int. J. Intercult. Relat.* **35**, 699–713 (2011).
- 598 35. Baker, J. E. Preparing prisoners for their return to the community. *Fed. Probation* **30**, 43
599 (1966).
- 600 36. Schulting, A. B., Malone, P. S. & Dodge, K. A. The effect of school-based kindergarten
601 transition policies and practices on child academic outcomes. *Dev. Psychol.* **41**, 860–871 (2005).
- 602 37. Södersten, P., Bergh, C., Leon, M., Brodin, U. & Zandian, M. Cognitive behavior therapy
603 for eating disorders versus normalization of eating behavior. *Physiol. Behav.* **174**, 178–190
604 (2017).
- 605 38. Wood, W. & Neal, D. T. A new look at habits and the habit-goal interface. *Psychol. Rev.*
606 **114**, 843 (2007).
- 607 39. Wood, W. & Rüniger, D. Psychology of habit. *Annu. Rev. Psychol.* **67**, 289–314 (2016).

- 608 40. Ouellette, J. A. & Wood, W. Habit and intention in everyday life: the multiple processes
609 by which past behavior predicts future behavior. *Psychol. Bull.* **124**, 54–74 (1998).
- 610 41. Gostin, L. O. & Powers, M. What does social justice require for the public’s health?
611 Public health ethics and policy imperatives. *Health Aff.* **25**, 1053–1060 (2006).
- 612 42. Kitayama, S. et al. The dopamine D4 receptor gene (DRD4) moderates cultural
613 difference in independent versus interdependent social orientation. *Psychol. Sci.* **25**, 1169–1177
614 (2014).
- 615 43. Kitayama, S. & Uskul, A. K. Culture, mind, and the brain: current evidence and future
616 directions. *Annu. Rev. Psychol.* **62**, 419–449 (2011).
- 617 44. Upshur, R. The ethics of quarantine. *AMA J. Ethics* **5**, 393–395 (2003).
- 618 45. Lewnard, J. A. & Lo, N. C. Scientific and ethical basis for social-distancing interventions
619 against COVID-19. *Lancet Infect. Dis.* [https://doi.org/10.1016/S1473-3099\(20\)30190-0](https://doi.org/10.1016/S1473-3099(20)30190-0) (2020).
- 620 46. Barbisch, D., Koenig, K. L. & Shih, F.-Y. Is there a case for quarantine? Perspectives
621 from SARS to Ebola. *Disaster Med. Public* **9**, 547–553 (2015).
- 622 47. Renn, O. Risk communication: insights and requirements for designing successful
623 communication programs on health and environmental hazards. in *Handbook Of Risk And Crisis*
624 *Communication* (eds. Heath, R.L., O’Hair H.D.) 80-98 (Routledge, 2008).
- 625 48. Degeling, C. et al. Community perspectives on the benefits and risks of technologically
626 enhanced communicable disease surveillance systems: a report on four community juries. *BMC*
627 *Med. Ethics* **21**, 31 (2020).
- 628 49. Yancy, C. W. COVID-19 and African Americans. *JAMA* **323**, 1891-1892 (2020).
- 629 50. Boyce, T. Towards equity in immunisation. *Euro Surveill.*
630 <https://dx.doi.org/10.2807%2F1560-7917.ES.2019.24.2.1800204> (2017).
- 631 51. Basu, A. & Dutta, M. J. Sex workers and HIV/AIDS: analyzing participatory culture-
632 centered health communication strategies. *Hum. Commun. Res.* **35**, 86–114 (2009).
- 633 52. Basu, A. & Dutta, M. J. ‘We are mothers first’: localocentric articulation of sex worker
634 identity as a key in HIV/AIDS communication. *Women Health* **51**, 106–123 (2011).
- 635 53. Dutta, M. J. et al. Critical health communication method as embodied practice of
636 resistance: culturally centering structural transformation through struggle for voice. *Front.*
637 *Commun.* **4**, 67 (2019).
- 638 54. Sastry, S., Stephenson, M., Dillon, P. & Carter, A. A meta-theoretical systematic review
639 of the culture-centered approach to health communication: toward a refined, ‘nested’ model.
640 *Commun. Theory* <https://doi.org/10.1093/ct/qtz02> (2019).
- 641 55. Oswald, A. J. & Powdthavee, N. The Case for Releasing the Young from Lockdown: A
642 Briefing Paper for Policymakers. Preprint at <https://ssrn.com/abstract=3573283> (2020).
- 643 56. Carrieri, D. et al. ‘Care under pressure’: a realist review of interventions to tackle
644 doctors’ mental ill-health and its impacts on the clinical workforce and patient care. *BMJ Open*
645 **8**, e021273 (2018).
- 646 57. Seale, H., Leask, J., Po, K. & MacIntyre, C. R. ‘Will they just pack up and leave?’–
647 attitudes and intended behaviour of hospital health care workers during an influenza pandemic.
648 *BMC Health Serv. Res.* **9**, 30 (2009).
- 649 58. Liu, S. et al. Online mental health services in China during the COVID-19 outbreak.
650 *Lancet Psychiat.* **7**, e17–e18 (2020).
- 651 59. Kosfeld, M. & Neckermann, S. Getting more work for nothing? Symbolic awards and
652 worker performance. *Am. Econ. J. Microecon.* **3**, 86–99 (2011).
- 653 60. Lacetera, N., Macis, M. & Slonim, R. Economic rewards to motivate blood donations.

- 654 *Science* **340**, 927–928 (2013).
- 655 61. Harrison, M. Pandemics. in *The Routledge History Of Disease* (ed. Jackson, M.) 128–146
656 (2016).
- 657 62. Dryhurst, S. Risk perceptions of COVID-19 around the world. *J. Risk Res.*
658 <https://doi.org/10.1080/13669877.2020.1758193> (2020).
- 659 63. Bennett, P., Calman, K., Curtis, S. & Fischbacher-Smith, D. *Risk Communication and*
660 *Public Health*. (Oxford University Press, 2010).
- 661 64. Giddens, A. *The Consequences of Modernity* (John Wiley & Sons, 2013).
- 662 65. Luhmann, N. *Trust and Power* (John Wiley & Sons, 2018).
- 663 66. Reynolds, B. & W. Seeger, M. Crisis and emergency risk communication as an
664 integrative model. *J. Health Commun.* **10**, 43–55 (2005).
- 665 67. Salvi, C. et al. Emergency risk communication—early lessons learned during the pilot
666 phase of a five-step capacity-building package. *Public Health Panorama* **4**, 51–57 (2018).
- 667 68. Renn, O. & Levine, D. Credibility and trust in risk communication. in *Communicating*
668 *Risks to the Public* (eds. Kasperson, R. E., Stallen, P. J. M.) 175–217 (Springer Netherlands,
669 1991).
- 670 69. Bles, D. The effects of communicating uncertainty on public trust in facts and numbers.
671 *P. Natl. Acad. Sci. USA* **117**, 7672–7683 (2020).
- 672 70. Chalofsky, N. & Krishna, V. meaningfulness, commitment, and engagement: the
673 intersection of a deeper level of intrinsic motivation. *Adv. Dev. Hum. Resour.* **11**, 189–203
674 (2009).
- 675 71. Ulbig, S. G. Voice is not enough. *Public Opin. Q.* **72**, 523–539 (2008).
- 676 72. Ledingham, K., Hinchliffe, S., Jackson, M., Thomas, F. & Tomson, G. *Antibiotic*
677 *Resistance: Using a Cultural Contexts of Health Approach to Address a Global Health*
678 *Challenge* (World Health Organization, 2019).
- 679 73. Toppenberg-Pejcic, D. et al. Emergency risk communication: lessons learned from a
680 rapid review of recent gray literature on Ebola, Zika, and yellow fever. *J. Health Commun.* **34**,
681 437–455 (2019).
- 682 74. World Health Organization. *Communicating Risk in Public Health Emergencies: A WHO*
683 *Guideline for Emergency Risk Communication (ERC) Policy And Practice* (World Health
684 Organization, 2017).
- 685 75. Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J. & Griskevicius, V. The
686 constructive, destructive, and reconstructive power of social norms. *Psychol. Sci.* **18**, 429–434
687 (2007).
- 688 76. Sheeran, P. et al. The impact of changing attitudes, norms, and self-efficacy on health-
689 related intentions and behavior: a meta-analysis. *Health Psychol.* **35**, 1178 (2016).
- 690 77. Tankard, M. E. & Paluck, E. L. Norm perception as a vehicle for social change. *Soc.*
691 *Issues Policy Rev.* **10**, 181–211 (2016).
- 692 78. Tankard, M. E. & Paluck, E. L. The effect of a supreme court decision regarding gay
693 marriage on social norms and personal attitudes. *Psychol. Sci.* **28**, 1334–1344 (2017).
- 694 79. Wilkinson, A., Parker, M., Martineau, F. & Leach, M. Engaging ‘communities’:
695 anthropological insights from the West African Ebola epidemic. *Philos. T. R. Soc. B.*
696 <https://doi.org/10.1098/rstb.2016.0305> (2017).
- 697 80. Burchell, K., Rettie, R. & Patel, K. Marketing social norms: social marketing and the
698 ‘social norm approach’. *J. Consum. Behav.* **12**, 1–9 (2013).
- 699 81. Andrews, J. L., Foulkes, L. & Blakemore, S. J. Peer influence in adolescence: public-

- 700 health implications for COVID-19. *Trends Cogn. Sci.* <https://doi.org/10.1016/j.tics.2020.05.001>
701 (2020).
- 702 82. Fischer, P., Greitemeyer, T., Kastenmüller, A., Vogrincic, C. & Sauer, A. The effects of
703 risk-glorifying media exposure on risk-positive cognitions, emotions, and behaviors: a meta-
704 analytic review. *Psychol. Bull.* **137**, 367 (2011).
- 705 83. Sunstein, C. R. Lapidation and Apology. *SSRN* <http://dx.doi.org/10.2139/ssrn.3407390>
706 (2019).
- 707 84. Valente, T. W. & Pumpuang, P. Identifying opinion leaders to promote behavior change.
708 *Health Educ. Behav.* **34**, 881–896 (2007).
- 709 85. Roos, P., Gelfand, M., Nau, D. & Lun, J. Societal threat and cultural variation in the
710 strength of social norms: an evolutionary basis. *Organ. Behav. Human Decis. Process.* **129**, 14–
711 23 (2015).
- 712 86. Bierhoff, H. W. & Küpper, B. Social psychology of solidarity. in *Solidarity* (ed. Bayertz,
713 K.) 133–156 (Springer, 1999).
- 714 87. Pfattheicher, S., Nockur, L., Böhm, R., Sassenrath, C. & Petersen, M. B. The emotional
715 path to action: Empathy promotes physical distancing during the COVID-19 pandemic. Preprint
716 at <https://psyarxiv.com/y2cg5/> (2020).
- 717 88. Carver, C. S. Resilience and thriving: issues, models, and linkages. *J. Soc. Issues* **54**,
718 245–266 (2010).
- 719 89. García-Mira, R., Real, J. E., Uzzell, D. L., San Juan, C. & Pol, E. Coping with a threat to
720 quality of life: the case of the Prestige disaster. *Eu. Rev. Appl. Psychol.* **56**, 53–60 (2006).
- 721 90. Joseph, S. & Linley, P. A. *Trauma, Recovery, and Growth: Positive Psychological*
722 *Perspectives on Posttraumatic Stress* (John Wiley & Sons, 2008).
- 723 91. Richardson, G. E., Neiger, B. L., Jensen, S. & Kumpfer, K. L. The resiliency model.
724 *Health Educ. J.* **21**, 33–39 (1990).
- 725 92. Chmitorz, A. et al. Intervention studies to foster resilience – a systematic review and
726 proposal for a resilience framework in future intervention studies. *Clin. Psychol. Rev.* **59**, 78–100
727 (2018).
- 728 93. Mistretta, E. G. et al. Resilience training for work-related stress among health care
729 workers: results of a randomized clinical trial comparing in-person and smartphone-delivered
730 interventions. *J. Occup. Environ. Med.* **60**, 559–568 (2018).
- 731 94. Witte, K. Fear control and danger control: a test of the extended parallel process model
732 (EPPM). *Commun. Monogr.* **61**, 113–134 (1994).
- 733 95. Tannenbaum, M. B. et al. Appealing to fear: a meta-analysis of fear appeal effectiveness
734 and theories. *Psychol. Bull.* **141**, 1178–1204 (2015).
- 735 96. Bandura, A. Self-efficacy mechanism in human agency. *Am Psychol.* **37**, 122–147
736 (1982).
- 737 97. Bish, A. & Michie, S. Demographic and attitudinal determinants of protective behaviours
738 during a pandemic: a review. *Br. J. Health Psychol.* **15**, 797–824 (2010).
- 739 98. Stewart, J. E., Wolfe, G. R., Maeder, L. & Hartz, G. W. Changes in dental knowledge
740 and self-efficacy scores following interventions to change oral hygiene behavior. *Patient Educ.*
741 *Couns.* **27**, 269–277 (1996).
- 742 99. Ashford, S., Edmunds, J. & French, D. P. What is the best way to change self-efficacy to
743 promote lifestyle and recreational physical activity? A systematic review with meta-analysis. *Br.*
744 *J. Health Psychol.* **15**, 265–288 (2010).
- 745 100. Betsch, C. et al. Germany COVID-19 Snapshot MOonitoring (COSMO Germany):

- 746 monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current
747 coronavirus outbreak in Germany. Preprint at
748 <https://www.psycharchives.org/handle/20.500.12034/2386> (2020).
- 749 101. Loewenstein, G., Sunstein, C. R. & Golman, R. Disclosure: psychology changes
750 everything. *Annu. Rev. Econ.* **6**, 391–419 (2014).
- 751 102. Van Bavel, J. J. et al. Using social and behavioural science to support COVID-19
752 pandemic response. *Nat. Hum. Behav.* **4**, 460–471 (2020).
- 753 103. Sandman, P. M. *Responding to Community Outrage: Strategies for Effective Risk*
754 *Communication* (AIHA, 1993).
- 755 104. Gallagher, K. M. & Updegraff, J. A. Health message framing effects on attitudes,
756 intentions, and behavior: a meta-analytic review. *Ann. Behav. Med.* **43**, 101–116 (2012).
- 757 105. Dannenberg, A., Lösschel, A., Paolacci, G., Reif, C. & Tavoni, A. On the provision of
758 public goods with probabilistic and ambiguous thresholds. *Environ. Resour. Econ.* **61**, 365–383
759 (2015).
- 760 106. Kahneman, D., Knetsch, J. L. & Thaler, R. H. Experimental tests of the endowment
761 effect and the coase theorem. *J. Political Econ.* **98**, 1325–1348 (1990).
- 762 107. Lindenberg, S. & Steg, L. Normative, gain and hedonic goal frames guiding
763 environmental behavior. *J. Soc. Issues* **63**, 117–137 (2007).
- 764 108. Crockett, M. J., Siegel, J. Z., Kurth-Nelson, Z., Dayan, P. & Dolan, R. J. Moral
765 transgressions corrupt neural representations of value. *Nat. Neurosci.* **20**, 879–885 (2017).
- 766 109. Zarocostas, J. How to fight an infodemic. *Lancet* **395**, 676 (2020).
- 767 110. Pennycook, G., McPhetres, J., Zhang, Y. & Rand, D. Fighting COVID-19
768 misinformation on social media: Experimental evidence for a scalable accuracy nudge
769 intervention. Preprint at <https://psyarxiv.com/uwbk9/> (2020).
- 770 111. van der Linden, S., Maibach, E., Cook, J., Leiserowitz, A. & Lewandowsky, S.
771 Inoculating against misinformation. *Science* **358**, 1141–1142 (2017).
- 772 112. van der Linden, S., Leiserowitz, A., Rosenthal, S. & Maibach, E. Inoculating the public
773 against misinformation about climate change. *Glob. Challenges*
774 <https://doi.org/10.1002/gch2.201600008> (2017).
- 775 113. Roozenbeek, J. & Linden, S. Fake news game confers psychological resistance against
776 online misinformation. *Palgrave Commun.* **5**, 65 (2019).
- 777 114. McGuire, W. J. Public communication as a strategy for inducing health-promoting
778 behavioral change. *Prev. Med.* [https://doi.org/10.1016/0091-7435\(84\)90086-0](https://doi.org/10.1016/0091-7435(84)90086-0) (1984).
- 779 115. McGuire, W. Inducing resistance to persuasion. in *Advances in Experimental Social*
780 *Psychology* (Academic Press, 1964).
- 781 116. Banas, J. A. & Rains, S. A. A meta-analysis of research on inoculation theory. *Commun.*
782 *Monogr.* **77**, 281–311 (2010).
- 783 117. Chan, M. S., Jones, C. R., Hall Jamieson, K. & Albarracín, D. Debunking: a meta-
784 analysis of the psychological efficacy of messages countering misinformation. *Psychol. Sci.* **28**,
785 1531–1546 (2017).
- 786 118. Schmid, P. & Betsch, C. Effective strategies for rebutting science denialism in public
787 discussions. *Nat. Hum. Behav.* **3**, 931–939 (2019).
- 788 119. Lewandowsky, S., Ecker, U. K., Seifert, C. M., Schwarz, N. & Cook, J. Misinformation
789 and its correction continued influence and successful debiasing. *Psychol. Sci.* **13**, 106–131
790 (2012).
- 791 120. Cook, J. & Lewandowsky, S. *The Debunking Handbook*. (University of Queensland,

- 792 2012).
- 793 121. Strzelecki, A. The second worldwide wave of interest in coronavirus since the COVID-19
794 outbreaks in South Korea, Italy and Iran: a Google Trends study. Preprint at
795 <https://arxiv.org/abs/2003.10998> (2020).
- 796 122. Liao, Q., Cowling, B. J., Lam, W. W. T. & Fielding, R. Factors affecting intention to
797 receive and self-reported receipt of 2009 pandemic (H1N1) vaccine in Hong Kong: a
798 longitudinal study. *PLoS One* **6**, e17713 (2011).
- 799 123. Chan, M. S. et al. Legacy and social media respectively influence risk perceptions and
800 protective behaviors during emerging health threats: a multi-wave analysis of communications
801 on Zika virus cases. *Soc. Sci. Med.* **212**, 50–59 (2018).
- 802 124. Lieberoth, A., Čepulić, D.-B., Rasmussen, J. COVIDiSTRESS global survey. Preprint at
803 <https://osf.io/z39us/> (2020).
- 804 125. Service, O. et al. EAST Four Simple Ways to Apply Behavioural Insights. (Behavioural
805 Insights Team, 2014).
- 806 126. Hovland, C. I. & Weiss, W. The influence of source credibility on communication
807 effectiveness. *Public Opin. Q.* **15**, 635–650 (1951).
- 808 127. Brinol, P. & Petty, R. E. Source factors in persuasion: a self-validation approach. *Eu.*
809 *Rev. Soc. Psychol.* **20**, 49–96 (2009).
- 810 128. Griffin, R. J. & Dunwoody, S. The relation of communication to risk judgment and
811 preventive behavior related to lead in tap water. *Health Commun.* **12**, 81–107 (2000).
- 812 129. Niederdeppe, J. et al. Content and effects of news stories about uncertain cancer causes
813 and preventive behaviors. *Health Commun.* **29**, 332–346 (2014).
- 814 130. King, C. L., Chow, M. Y., Wiley, K. E. & Leask, J. Much ado about flu: a mixed
815 methods study of parental perceptions, trust and information seeking in a pandemic. *Influenza*
816 *Other Resp.* **12**, 514–521 (2018).
- 817 131. Pan American Health Organization/World Health Organization. *COVID-19 An*
818 *informative guide. Advice for journalists* (Pan American Health Organization, 2020)
- 819 132. World Health Organization. *Effective Media Communication during Public Health*
820 *Emergencies. A WHO Handbook* (World Health Organization, 2005).
- 821 133. Mullen, P. D. et al. A meta-analysis of trials evaluating patient education and counseling
822 for three groups of preventive health behaviors. *Patient Educ. Couns.* **32**, 157–173 (1997).
- 823 134. Mesch, G. S. & Schwirian, K. P. Confidence in government and vaccination willingness
824 in the USA. *Health Promot. Int.* **30**, 213–221 (2015).
- 825 135. Hooker, C., King, C. & Leask, J. Journalists' views about reporting avian influenza and a
826 potential pandemic: a qualitative study. *Influenza Other Resp.* **6**, 224–229 (2012).
- 827 136. Kelleher, C. A. & Wolak, J. Priming presidential approval: the conditionality of issue
828 effects. *Political Behav.* **28**, 193–210 (2006).
- 829 137. Kogen, L. & Dilliplane, S. How media portrayals of suffering influence willingness to
830 help: the role of solvability frames. *J. Media Psychol.* **31**, 92–102 (2019).
- 831 138. Staniland, K. & Smith, G. Flu frames. *Sociol. Health Illn.* **35**, 309–324 (2013).
- 832 139. Means, A. R. et al. Evaluating and optimizing the consolidated framework for
833 implementation research (CFIR) for use in low-and middle-income countries: a systematic
834 review. *Implement. Sci.* **15**, 1–19 (2020).
- 835 140. Dutta, M. J. Culture-centered approach in addressing health disparities: communication
836 infrastructures for subaltern voices. *Commun. Methods Meas.* **12**, 239–259 (2018).
- 837 141. Napier, D. et al. *Culture Matters: Using a Cultural Contexts of Health Approach to*

838 *Enhance Policy-Making*. (World Health Organization Regional Office for Europe, 2017).

839 142. Camerer, C. F. et al. Evaluating replicability of laboratory experiments in economics.

840 *Science* **351**, 1433–1436 (2016).

841 143. Ioannidis, J. P. A. Why most published research findings are false. *PLoS Med.* **2**, e124

842 (2005).

843 144. Henrich, J., Heine, S. J. & Norenzayan, A. The weirdest people in the world? *Behav.*

844 *Brain Sci.* **33**, 61–83 (2010).

845 145. Klein, R. A. et al. Many Labs 2: investigating variation in replicability across samples

846 and settings. *Adv. Methods Pract. Psychol. Sci.* **1**, 443–490 (2018).

847 146. IJzerman, H. et al. Psychological Science is Not Yet a Crisis-Ready Discipline. Preprint

848 at: <https://psyarxiv.com/whds4/> (2020).

849 147. Betsch, C. How behavioural science data helps mitigate the COVID-19 crisis. *Nat. Hum.*

850 *Behav.* <https://doi.org/10.1038/s41562-020-0866-1> (2020).

851 148. WHO Regional Office For Europe. COVID-19 Snapshot MOnitoring (COSMO

852 Standard): monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the

853 current coronavirus outbreak - WHO standard protocol.

854 <https://doi.org/10.23668/PSYCHARCHIVES.2782> (2020).

855 149. Privy Council Office Of Canada. Canada COVID-19 Snapshot MOnitoring (COSMO

856 Canada): monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the

857 current coronavirus outbreak in Canada <http://dx.doi.org/10.23668/psycharchives.2868> (2020).

858 150. Saletti-Cuesta, L., Berra, S., Tumas, N., Johnson, C. & Carbonetti, A. Argentina COVID-

859 19 Snapshot MOnitoring (COSMO Argentina): monitoring knowledge, risk perceptions,

860 preventive behaviours, and public trust in the current coronavirus outbreak in Argentina

861 <http://dx.doi.org/10.23668/psycharchives.2788> (2020).

862 151. Böhm, R., Lilleholt, L., Zettler, I. & COSMO Denmark Group. Denmark COVID-19

863 Snapshot MOnitoring (COSMO Denmark): monitoring knowledge, risk perceptions, preventive

864 behaviours, and public trust in the current coronavirus outbreak in Denmark

865 <http://dx.doi.org/10.23668/psycharchives.2795> (2020).

866 152. Abera, N., Alemayehu, A., Belayneh, F. & Jember, D. Ethiopia COVID-19 Snapshot

867 MOnitoring (COSMO Ethiopia): monitoring knowledge, risk perceptions, preventive behaviours,

868 and public trust in the current coronavirus outbreak in Ethiopia

869 <http://dx.doi.org/10.23668/psycharchives.2877> (2020).

870 153. Aharonson-Daniel, L., Davidovitch, N., Fuchs, G., Dopelt, K. & Shibli, H. Israel

871 COVID-19 Snapshot MOnitoring (COSMO Israel): monitoring knowledge, risk perceptions,

872 preventive behaviours, and public trust in the current coronavirus outbreak in Israel

873 <http://dx.doi.org/10.23668/psycharchives.2866> (2020).

874 154. Alamro, N. et al. Saudi Arabia COVID-19 Snapshot MOnitoring (COSMO Saudi):

875 monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current

876 coronavirus outbreak in Saudi Arabia <http://dx.doi.org/10.23668/psycharchives.2878> (2020).

877 155. Hadi, T. A. & Fleshler, K. Integrating social media monitoring into public health

878 emergency response operations. *Disaster Med. Public* **10**, 775–780 (2016).

879 156. Lischetzke, T. Daily Diary Methodology. in *Encyclopedia of Quality of Life and Well-*

880 *Being Research* (ed. Michalos, A. C.) 1413–1419 (Springer Netherlands, 2014).

881 157. Ferretti, L. et al. Quantifying SARS-CoV-2 transmission suggests epidemic control with

882 digital contact tracing. *Science* **368**, eabb6936 (2020).

883 158. Wang, C. J., Ng, C. Y. & Brook, R. H. Response to COVID-19 in Taiwan: big data

884 analytics, new technology, and proactive testing. *JAMA* **323**, 1341 (2020).
885

886 **Competing interests**

887 The authors declare no competing interests.

