

# Impacts of social isolation among disadvantaged and vulnerable groups during public health crises

## Authors

Charlotte Gayer-Anderson, Rachel Latham, Catherine El Zerbi, Lucy Strang, Vivienne Moxham Hall, Gemma Knowles, Sally Marlow, Mauricio Avendano, Nick Manning, Jayati Das-Munshi, Helen Fisher, Diana Rose, Louise Arseneault, Hanna Kienzler, Nikolas Rose, Stephani Hatch, Charlotte Woodhead, Craig Morgan, Ben Wilkinson

*ESRC Centre for Society & Mental Health, King's College London*

## Introduction

Throughout history, infectious disease epidemics (ie, affecting many people in a community or region) and pandemics (ie, affecting many people in multiple communities or regions) have periodically devastated populations, causing widespread morbidity, massively increased mortality, and profound fear and anxiety. Examples include severe acute respiratory syndrome (SARS; 2003), Ebola (2004), Swine Flu (H1N1 subtype; 2009), and Middle East respiratory syndrome (MERS; 2012). Strategies to ensure physical and social distancing have been prominent among efforts by societies to contain the spread of disease. These strategies have varied, ranging from isolating those with the disease, to quarantining those suspected of being exposed to infection (eg, during the H1N1 pandemic), to community- and society-wide restrictions, such as those imposed during the SARS and the Ebola outbreaks. Since the outbreak in December 2019 of the novel coronavirus disease (COVID-19) in Wuhan, China and its subsequent spread globally, various social distancing strategies have been implemented by governments, including closure of workplaces and schools, cancellation of mass gatherings, and restrictions on movement. These all involve substantial changes in behaviour and daily routines, with profound economic and social costs.

The social restrictions imposed by many governments have reduced rates of new infections and of virus-related deaths. However, society-wide social distancing has transformed, more or less overnight, our social worlds, with far reaching effects on education, jobs, incomes, housing, and relationships, and on physical and mental health. We know in general, from extensive work in the social and psychological sciences, that positive social connections and relationships are fundamental for our well-being and sense of selves; we are social beings. The loss of these connections can have profound mental and physical effects. For example, in their recent rapid review, Brooks et al (2020) [1] found strong evidence of several adverse mental health consequences of quarantine, including low mood, depression, stress, difficulty sleeping, irritability, and anger. In relation to the COVID-19 pandemic, several reports have already been

published that document the profound economic, social, and personal costs of the pandemic and related social restrictions implemented by governments. Societies, therefore, face the major challenge of how to minimise the effects of these far reaching social changes – including consequent social isolation – on people's lives in the short, medium, and long term.

Pandemics and consequent enforced social distancing affect whole populations. However, they do not affect all equally. The COVID-19 pandemic is likely to have a disproportionate impact on the most disadvantaged, marginalised, and vulnerable – as we have seen in previous epidemics and pandemics. This includes those in insecure jobs, on low incomes, and in overcrowded housing; those in marginalised communities, including minority ethnic communities, migrants, and refugees; women and children in violent and abusive households; older people who are already isolated and lonely; and those with existing mental health problems. These disadvantages cluster and are further amplified by the pandemic and related social restrictions. There is already evidence of differential effects. Mortality is higher among health care workers, in black and minority ethnic groups, and in poor and disadvantaged populations. In other words, the impacts of COVID-19 and associated restrictions are socially structured. In developing effective responses, we need to know what existing research tells us about the effects of social isolation and distancing in the context of public health crises, how these pattern by social group, the mechanisms involved, and what can be done to mitigate adverse effects.

The purpose of this review is to address the question: What does the social science and other literature tell us about the impacts of social isolation on disadvantaged, marginalised, and vulnerable populations in the context of pandemics and other public health crises? This will provide a synthesis of existing evidence that can both (1) identify gaps and priorities for further research and (2) inform the development of strategies and policies to mitigate the impact of social distancing and isolation on mental and physical health and on social outcomes.

## Method

Using a set of predefined search terms (see Annex 1), we searched MEDLINE, PsycINFO, Embase, Cochrane Library, Campbell Reviews, Applied Social Sciences Index and Abstracts (ASSIA), International Bibliography of the Social Sciences (IBSS), Educational Resources Information Centre (ERIC), and grey literature sources (MedRxiv, SocArxiv and PsyArxiv (for pre-prints/working papers), ProQuest, OpenGrey, Bielefeld Academic Search Engine (BASE), the British Library E-thesis online service (EThOS), and the World Health Organization website). In brief, we used a combination of terms relating to quarantine (eg, “quarantine” or “social isolation” or “social distancing”) and examples of pandemic infections or other public health crisis that may have resulted in enforced isolation (eg, “COVID-19” or “SARS” or “Ebola” or “MERS”, or “HIV/AIDS” or “chemical spill” or “industrial accident” or nuclear radiation”). We did not limit our search by outcome or populations of interest. Studies were included if they reported on primary research, were in English, and examined the influence of any level of social distancing on physical or mental health or any social outcome. Quantitative observational, qualitative, and intervention studies were included.

## Findings

Our search yielded 13,272 papers. It is notable that our searches returned many more editorials and opinion pieces commenting on pandemics and public health crises – and proposing responses – than empirical papers providing relevant evidence. From the 13,272 papers returned, we identified 50 empirical papers that met our inclusion criteria (see Annex 1 for full details on the screening process and the characteristics of included studies). We identified papers relevant to health care workers (n, 16), children and adolescents (n, 16), older people (n, 3), people with pre-existing conditions (n, 10), and disadvantaged and marginalised groups (n, 7). We found no papers relevant to refugees, the homeless, or women in abusive relationships. Further, we found no studies of social practices, policies, or interventions designed to mitigate the impact of isolation measures during public health crises among vulnerable and disadvantaged groups. The studies included were methodologically varied and spanned several countries and pandemics, making comparisons and overall synthesis challenging.

### Health Care Workers

In any epidemic or pandemic, front line health care workers are among the most exposed and therefore vulnerable to infection and related responses, including quarantine and social isolation. Rates of mortality, for example, are high among health care workers, as is sadly evident in the current COVID-19 pandemic. We identified 16 studies (9 quantitative, 6 qualitative, 1 mixed methods) that explored the impacts of being quarantined among health care workers in the context of several public health crises (ie, SARS [n, 11], Ebola [n, 3], MERS [n, 1], COVID-19 [n, 1]). All focussed primarily on mental

health outcomes (n, 9) and/or social consequences (n, 10) during and after quarantine.

In relation to mental health and stress-related outcomes, findings were broadly consistent but with occasional conflicting reports. Four studies reported a higher prevalence of mental health problems and negative stress responses among quarantined staff compared with non-quarantined staff [2-5]. For example, a cross-sectional study of 549 hospital staff in China, conducted three years after the SARS outbreak, found evidence of the negative long-term effects of quarantine among health care staff. Those who were quarantined reported more symptoms of depression [5], alcohol abuse [3], and post-traumatic stress disorder [4], after controlling for factors such as age, sex, marital status, family income, and prior exposure to traumatic events. Further, Reynolds et al (2008) [6], in a study in Canada comparing health care workers (n, 269) and people from the general population (n, 788), all of whom had been quarantined, found higher levels of post-traumatic stress among health care workers. Further, there was some evidence from 2 studies that longer duration of quarantine was associated with poorer mental health [6,7]. However, 2 papers report no differences between quarantined and non-quarantined staff [8,9] and between quarantined staff and members of the public who had experienced some time in quarantine [9].

We identified several qualitative studies (with samples ranging from 9 to 35 individuals, conducted using semi-structured interviews [n, 5] or unstructured interviews [n, 1]) that provide insights into the social processes that may underlie the increased mental distress observed in most studies among health care staff who have experienced periods of quarantine. Across these studies, a number of common themes were evident - despite different samples, settings, and countries. Prominent among these were: concerns about personal safety [10], fears about transmitting the disease to family members [10-12], loss of intimacy and social contact, resulting in physical and psychological isolation from loved ones [12-14], perceived stigma from others [10-15], and fear of returning to work [12].

### Children and Adolescents

We identified 16 studies that examined the impacts of social distancing, quarantine, and social isolation in the context of public health crises on children and adolescents. Of these, 8 explored impacts on mental health, 5 on physical health and mortality, 2 on risk of violence, and 1 on education.

In relation to mental health outcomes, as for health care workers, findings were broadly consistent but with occasional conflicting reports. In the main, among children and adolescents who experienced periods of quarantine or social isolation, mental distress was common. Aside from the study by Koller et al. (2006a and b) [16, 17], which was a qualitative study involving 5 quarantined children, their parents, and eight paediatric health care providers, these studies were all cross-sectional surveys, with samples ranging between 233

[18] and 2,111 participants [19]. The majority, with the exception of YoungMinds (2020) [19] and Oosterhoff et al., (2020) [20], measured outcomes based on parental reports. Several studies report more worry [21-23], fear [23], and loneliness - and sadness attributed to this [16, 17, 23]. This noted, 2 studies reported minimal or no impact on children's mental health and wellbeing [18, 20]. In addition, Sprang and Silman (2009) [24] compared parent-reported symptoms of post-traumatic stress in children quarantined and not quarantined during the SARS and H1N1 outbreak. They found that mean post-traumatic stress scores were four times higher in children who had been quarantined compared with children who had not.

Two studies specifically examined more vulnerable groups of young people during quarantine, ie, young people with pre-existing mental health problems [19] and children with Special Educational Needs and Disabilities (SENDs) [21]. The Young Minds (2020) survey of 2,111 adolescents and young adults (aged 13 to 25) found evidence of a worsening of pre-existing mental health problems during the early stages of the COVID-19 lockdown in the UK, including increased anxiety, sleep problems, panic attacks, and urges to self-harm among those with a history of self-harming [19]. In a UK study of 241 parents of children aged between 5 and 18 years (mean age 9 years) with SENDs, Asbury et al (2020) found that parents reported changes in emotions, mood, and behaviour in their children 2 to 3 weeks into the COVID-19 lockdown in the UK [21]. Both studies highlighted concerns about the loss of specialist input and support networks. The collective body of research on young people suggests adverse effects on mental health, particularly among those with pre-existing vulnerabilities. However, these studies are all cross-sectional surveys, with no comparison group (with the exception of [24]) or pre-social distancing measures of mental health. In addition, given most of these studies were in relation to COVID-19, we have almost no information on long-term consequences in these age groups.

There is some limited evidence, from five studies specific to the context of the Ebola outbreak in Sierra Leone and Liberia, on the impact of isolation and quarantine on physical health and mortality among children and adolescents. These studies suggest strict quarantine measures can have adverse effects on physical health and increase mortality. For example, in Sierra Leone around a quarter of children were unable to receive their normal vaccinations [25] and many families had less access to nutritious food. This disproportionately affected infants and young children [26]. One study, involving interviews with community leaders in Liberia, reported substantial increases in infant and child mortality as a consequence of community quarantine following hospitalisation or death of parents infected with Ebola. It seems that no one was willing to care for the children for fear of contracting the virus [27].

Two further studies reported a heightened risk for – and difficulty reporting – abuse and violence among quarantined girls during the Ebola crisis in West Africa

[25, 29]. For example, women and girls in quarantined households often needed to negotiate with the military and police who guarded their homes to fetch water, food, or firewood. This negotiation typically included providing payments, food, valuables, and sex, and thus exposed girls to manipulation, violence, and sexual exploitation [25].

The remaining studies, which considered broader impacts of isolation and quarantine during public health crises, provide evidence that children and their families experience more stigma from peers and their local community after being quarantined (eg, for SARS [15] and Ebola [29]), a loss of social connections with friends, with impacts on wellbeing [19, 30], and reduced access to education [31]. This latter cross-sectional survey of 768 parents conducted during the COVID-19 lockdown in the Netherlands, found that children with more advantaged parents received more support and had more resources (eg their own computer) available to help them continue with their school work at home. This suggests that inequalities in support for children's learning during sustained periods of community quarantine may exacerbate social inequalities.

### **Older People**

In general, social isolation among older people is a well-recognised and serious public health issue [32]. There is widespread concern that social restrictions to limit the spread of COVID-19 will disproportionately affect older people [33], particularly those who live alone [34]. We found no studies that specifically sought to examine the short- and long-term health and social impacts of social isolation in the context of public health crises in older people. However, 3 papers provided some indicative findings of the relative impacts among older people. These studies of general population samples disaggregated findings by age group. Two relate to COVID-19 and impacts on mental health, and one relates to MERS and impacts on employment.

Both studies that disaggregated impacts on mental health by age group suggested, perhaps surprisingly, fewer mental health problems in the older compared with younger groups. Singhal & Viayaraghavan (2020) [35], in a sample of 231 respondents in India, reported lower levels of health anxiety in those aged 69 years and above, compared with those aged 18 to 24 years. Similarly, in a more methodologically robust study of 2,025 people, Shevlin et al (2020) [36] found that those aged 64 years and above reported much lower levels of general anxiety, depression, and symptoms of traumatic stress, compared with those aged 18 to 24 (ie, 80% to 90% lower). This noted, the older group was more likely to report anxiety specifically related to COVID-19 (ie, OR 2.5). However, the data presented in these papers are cross-sectional and they do not tell us specifically whether experiences of mass social restrictions in the context of COVID-19 disproportionately increased levels of anxiety and depression among particular age groups. The only other study that we identified that provided data on the impact of social isolation and quarantine during

health crises on social outcomes among older people focused on employment following the MERS outbreak in South Korea [37]. In a sample of approximately 33,000 households, Lee & Cho (2007) found that, in areas most affected by strict quarantine, there was an increase in unemployment for those aged 50 and above, compared with those under 50. This difference was not evident in areas less affected by quarantine, which tentatively suggests the impacts of quarantine on employment disproportionately affected older people [37].

### People with Pre-existing Conditions

There is a small body of research on the impacts of social distancing in the context of public health crises among groups with pre-existing health conditions. We identified 7 related to physical health [38-44], and 1 to pregnant women and new mothers [45]. In the 7 papers identified, all focused primarily on mental health outcomes, eg depression, anxiety, and PTSD.

Findings were broadly consistent. Irrespective of condition or public health crisis, those who were quarantined or isolated (compared with those not) reported higher levels of anxiety, depression, PTSD, and other behavioural outcomes (eg anger). For example, Tarzi et al (2001) [40], in a study of 42 older adults receiving rehabilitation care who were admitted to hospital, found that those who were quarantined (n, 22) because they contracted MRSA were more likely to report higher rates of depression and anxiety than a control group without MRSA (ie not quarantined). Further, there is some evidence from two studies of general population convenience samples that those with existing mental health problems who were isolated as a consequence of measures to contain COVID-19 reported more experiences of depression, anxiety, stress, and post-traumatic stress disorder [44, 46]. However, several methodological limitations mean these findings – and others from this body research – should be interpreted cautiously. Overall, studies were cross-sectional and involved small and/or convenience samples. This noted, a qualitative study of pregnant women during the SARS outbreak in Hong Kong provides some insights into how isolation in the context of pandemics can have particular effects in vulnerable groups. Participants talked about increased worry and anxiety, in addition to that already associated with pregnancy and childbirth, because of greater uncertainty, fear of going out, and concerns about hygiene.

### Disadvantaged and Marginalised Groups

We did not identify any papers that specifically sought to examine the impacts of social isolation by economic, social, or ethnic group. However, 7 general papers did disaggregate findings and therefore provide some evidence on differential impacts in disadvantaged and marginalised groups. Four of these relate to COVID-19 [36, 47-49].

Again, all focused primarily on mental health outcomes and, despite differences in study design, pandemic, and setting, findings were broadly consistent: those in disadvantaged groups reported higher levels of mental

health problems. For example, 3 studies of general population samples in relation to COVID-19 – 2 in China, 1 in the UK – reported elevated levels of depression and anxiety among those on lower incomes. In the most methodologically robust study of 2,025 participants selected to be representative of the UK population, Shevlin et al (2020) found – against high overall levels of mental health problems following lockdown – that the odds of depression and anxiety were around two and a half times higher among those on low incomes compared with those in the highest income bracket. However, although data were collected during widespread home quarantine, this cross-sectional study did not explicitly examine the effect of quarantine on mental health [36].

Several studies in low income countries provide relevant data on why effects are especially pronounced in disadvantaged and minority groups. In analyses of data from several African countries collected using multiple methods, the Partnership for Evidence Based Response to COVID-19 [49] reported widespread concerns about lack of money and food, particularly among lower income participants, with hunger leading some in urban areas to violate quarantine measures to search for food. In addition to possible effects on mental health, analysis of incident data over time indicated a rise in violent incidents (including those in which protests sparked violent responses from authorities), since the implementation of various levels of social distancing in different countries. Two further studies provide ethnographic and qualitative data on the impacts of state-enforced social distancing. For example, an ethnographic study in Liberia in the context of the Ebola epidemic [50] suggested widespread concerns about disruption to 'social solidarity' and difficulties obeying quarantine measures as a result of intermittent provision of food, water, and other items. Participants also reported stigmatisation of quarantine-affected people or households, as well as increased fear, panic, suspicion, mistrust, and disenfranchisement of minority groups.

### Summary

Overall, there is a relatively small amount of research that has considered the impacts of social isolation on vulnerable, disadvantaged, and marginalised populations in the context of pandemics and other public health crises. Most of this research concerns health care workers and children and adolescents. For some groups, eg refugees, the homeless, and women in abusive relationships, we found no or few (eg minority ethnic groups) relevant studies. This noted, several observations can be made, albeit these need to be considered in light of notable limitations (see below):

- Across all groups on which there was data, the balance of evidence is that mental health problems are more common in vulnerable and disadvantaged groups, compared with others, following periods of social isolation and distancing in the context of public health crises.
- This disparity may be especially pronounced at

the intersections of multiple vulnerabilities and disadvantages, as indicated by findings that suggest young people with pre-existing conditions may be particularly affected.

- The disproportionate impacts extend to other – no doubt interrelated – outcomes and risks, including income, employment, access to food, access to health care, and discrimination.
- Social restrictions that confine people to their homes for extended periods increase risk of abuse and exploitation, particularly among girls and women.
- There are further inequalities in people's capacity to comply with social distancing measures, particularly for those on low incomes, in insecure employment, and living in overcrowded homes. Such groups are therefore both more likely to be exposed to infection and more likely to be sanctioned for violating regulations.

## Limitations

These general observations need to be considered in light of several important limitations that characterise much of the research reviewed.

To begin, there are notable methodological limitations that limit what can be inferred from the majority of the included studies. For example, most studies have relied on convenience samples, with consequent problems of selection bias; most are cross-sectional, which means it is impossible to determine the direction of associations; and few have included appropriate comparison groups that enable consideration of whether quarantine and other social distancing measures disproportionately affect vulnerable and disadvantaged groups. An exception to this latter limitation is general population studies that have disaggregated samples by social group. Further, the use of cross-sectional surveys, often during or shortly after periods of quarantine, mean that we have little data on the medium- and long-term impacts of social isolation, and that we rarely have 'benchmark' or pre-public health crisis data to discern whether mental health problems are increased from baseline levels.

Further, the research included is disparate and varied, limiting comparability and what can be inferred for any national or local policies. For example, there is substantial heterogeneity of outcome measures, which means direct comparisons and syntheses of findings are not possible. The studies were conducted in a range of contexts, varying by place, time, and by pandemic, and considered a range of quarantine and social distancing measures from individual isolation, to community wide social distancing, to police- and militarily-enforced quarantine. We therefore need to be cautious before applying international research to a UK context and before applying what is known in relation to other epidemics and pandemics to COVID-19. The type and duration of social restrictions imposed in previous outbreaks are very different to the unprecedented country-wide restrictions that characterise many responses to COVID-19. For example, the impacts of

community level social restrictions will be very different from effects of the individual or household quarantines that have been implemented in previous outbreaks of infectious diseases.

Finally, the research included only rarely drew from or engaged with relevant social science methods, theories, concepts, and evidence. This is a notable limitation. For example, no reports used an explicit theoretical model to articulate potential mechanisms linking exposure to different types of quarantine and outcomes, limiting the practical value of findings. This is despite a huge literature base relevant to the reported experiences and the mitigation of adverse effects (eg in relation to concepts of social isolation, social cohesion, social networks, social capital, minority stress, discrimination, allostatic load, and so on). Indeed, social science is particularly relevant to understanding how micro, meso, and macro-level structures and social processes interact to contribute to inequitable outcomes. It provides a set of theories and methods for examining contextual contingencies, how differences in social, political, economic, cultural, and historical factors affect how individuals, communities and populations are affected by and respond to the imposition of distancing measures. This includes understanding how public health responses to pandemics and other public health crises can lead to the exacerbation of existing inequalities (eg increasing stigmatisation of minority groups).

## Gaps in the evidence and priorities for research

Our review and synthesis highlight several substantial gaps in the evidence base. These need to be urgently addressed to inform evidence-based responses to mitigate the impacts of enforced social isolation, in the context of COVID-19 and subsequent pandemics, on the most vulnerable and disadvantaged in societies. Here we highlight 5 priorities for social science research:

- (1) Longitudinal studies, based on pre-existing cohorts with data on relevant outcomes before public health crises and the introduction of social restrictions, to directly examine the impact of social restrictions over the short, medium, and long term.
- (2) Targeted and localised studies explicitly taking an equity-informed or intersectional lens of impacts among vulnerable and disadvantaged groups, including – but not limited to – older people, black and minority ethnic groups, asylum seekers and refugees, those with a severe and enduring mental illness, women and children in violent and abusive households, and those on low incomes, in precarious employment, and insecure, unsafe, and overcrowded housing.
- (3) In-depth studies of lived experiences of social isolation and distancing, particularly among vulnerable and disadvantaged groups, using a range of creative methods (eg, photovoice, video diaries, journaling, longitudinal qualitative studies) to provide richer insights into how enforced social restrictions have transformed social lives and how individuals,

families, and social groups have responded and managed.

- (4) Studies on key topics on which there is currently no data, eg on the positive and negative impacts of social media and virtual social connections during 'lockdown'; on the effects of specific restrictions and policies (eg, school closures, shielding, job retention schemes).
- (5) Studies developing, implementing, and evaluating social practices (eg, mutual aid groups), policies, and interventions (at community, family, and individual levels) to mitigate the impact of isolation measures during public health crises among vulnerable and disadvantaged groups.

In this research, particular consideration should be given to capturing different lengths, types, and experiences of social distancing. Comparisons over time - as policies change - and between countries - as governments pursue different strategies - will be especially informative. Further, the limitations of previous studies highlight the importance of research that is methodologically robust. Several commentaries in relation to the upsurge of COVID-19 related research have cautioned against prioritising speed over quality in establishing research programmes. Our review reinforces this view and highlights the importance of robust sampling strategies (eg, to include underrepresented groups), of comparable and valid measures of relevant constructs, and of social science methods, theory, concepts, and evidence to frame and contextualise research, enabling more meaningful and impactful interpretations of collected data.

Social science therefore must have a central place in research to identify groups most at risk of adverse outcomes - and the mechanisms involved (at micro to macro levels) - and to inform the development of policies and (multi-level) interventions.

## Policy implications

The limitations and gaps in existing research noted, there are several policy implications of our review relevant to social isolation in disadvantaged, marginalised, and vulnerable populations in the context of public health crises.

- (1) Given that front line health care workers experience more mental distress, in addition to and in part because of the threats to physical health, health providers should prioritise establishing (a) channels of communication to minimise isolation and worry about colleagues and (b) personal health programmes to monitor workers' well-being during and after public health crises, when mental health problems may emerge
- (2) In light of evidence of particularly adverse impacts on children and adolescents, especially those with pre-existing mental health and other needs, several strategies and policies should be prioritised: (a) programmes to mitigate financial uncertainties and reduce food poverty in low income families (see point 3 below); (b) resources to enable schools to identify, monitor, and provide support for children and adolescents experiencing mental distress; (c) scaling up of and streamlined access to child and adolescent mental health services, both statutory and voluntary; and (d) provision of free high speed broadband for all disadvantaged households with school aged children (eg, all in receipt of free school meals), at the very least during periods of lockdown, on the basis that there is a prima facie case that internet access is critical to maintaining social connections, preventing disruption to school work, and accessing supports
- (3) Evidence on the impacts among older people is sparse and there is an urgent need for more research to inform policy in this area. In the meantime, in light of suggestive evidence that job losses are more common among those over age 50 in the context of pandemic social restrictions, policies that protect jobs for older employees may mitigate adverse effects.
- (4) In light of evidence of disproportionate effects on those with pre-existing conditions, policies should prioritise providing tailored public health messages and ensuring adequate service capacity to meet the needs of those in high risk groups, including those with pre-existing conditions.
- (5) Given that social restrictions particularly increase mental distress – and other outcomes – in socially and economically disadvantaged groups, probably because of the greater uncertainties around work, income, housing, and food, policies that alleviate these uncertainties should be prioritised. These include job retention schemes, income guarantee programmes, debt deferral plans, rent and mortgage holidays, and provision of food and other necessities. These policies may also ensure greater compliance with social distancing, given the evidence that lack of money, food, and other necessities make adherence to social restrictions impossible for some
- (6) Finally, there are several areas where there is a prima facie case for policies and resources to mitigate risks among the most vulnerable. That is, there are areas where we do not need to wait for (more) evidence to act. These include additional resources to support charities and organisations to provide services for victims of domestic violence and abuse.

## References

1. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, Rubin GJ. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*. 2020 Feb 26.
2. Bai Y, Lin CC, Lin CY, Chen JY, Chue CM, Chou P. Survey of stress reactions among health care workers involved with the SARS outbreak. *Psychiatric Services*. 2004 Sep;55(9):1055-7.
3. Wu P, Liu X, Fang Y, Fan B, Fuller CJ, Guan Z, Yao Z, Kong J, Lu J, Litvak IJ. Alcohol abuse/dependence symptoms among hospital employees exposed to a SARS outbreak. *Alcohol & Alcoholism*. 2008 Nov 1;43(6):706-12.
4. Wu P, Fang Y, Guan Z, Fan B, Kong J, Yao Z, Liu X, Fuller CJ, Susser E, Lu J, Hoven CW. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *The Canadian Journal of Psychiatry*. 2009 May;54(5):302-11.
5. Liu X, Kakade M, Fuller CJ, Fan B, Fang Y, Kong J, Guan Z, Wu P. Depression after exposure to stressful events: lessons learned from the severe acute respiratory syndrome epidemic. *Comprehensive psychiatry*. 2012 Jan 1;53(1):15-23.
6. Reynolds DL, Garay JR, Deamond SL, Moran MK, Gold W, Styra R. Understanding, compliance and psychological impact of the SARS quarantine experience. *Epidemiology & Infection*. 2008 Jul;136(7):997-1007.
7. Marjanovic Z, Greenglass ER, Coffey S. The relevance of psychosocial variables and working conditions in predicting nurses' coping strategies during the SARS crisis: an online questionnaire survey. *International journal of nursing studies*. 2007 Aug 1;44(6):991-8.
8. Lee SM, Kang WS, Cho AR, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Comprehensive psychiatry*. 2018 Nov 1;87:123-7.
9. Zhu S, Wu Y, Zhu CY, Hong WC, Yu ZX, Chen ZK, Chen ZL, Jiang DG, Wang YG. The immediate mental health impacts of the COVID-19 pandemic among people with or without quarantine managements. *Brain, Behavior, and Immunity*. 2020 Apr 18.
10. Maunder R, Hunter J, Vincent L, Bennett J, Peladeau N, Leszcz M, Sadavoy J, Verhaeghe LM, Steinberg R, Mazzulli T. The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Cmaj*. 2003 May 13;168(10):1245-51.
11. Desclaux A, Badji D, Ndione AG, Sow K. Accepted monitoring or endured quarantine? Ebola contacts' perceptions in Senegal. *Social Science & Medicine*. 2017 Apr 1;178:38-45.
12. Robertson E, Hershenfield K, Grace SL, Stewart DE. The psychosocial effects of being quarantined following exposure to SARS: a qualitative study of Toronto health care workers. *The Canadian Journal of Psychiatry*. 2004 Jun;49(6):403-7.
13. Gershon R, Dernehl LA, Nwankwo E, Zhi Q, Qureshi K. Experiences and psychosocial impact of West Africa Ebola deployment on US health care volunteers. *PLoS currents*. 2016 Sep 21;8.
14. McMahon SA, Ho LS, Brown H, Miller L, Ansumana R, Kennedy CE. Healthcare providers on the frontlines: a qualitative investigation of the social and emotional impact of delivering health services during Sierra Leone's Ebola epidemic. *Health Policy and Planning*. 2016 Nov 1;31(9):1232-9.
15. DiGiovanni C, Conley J, Chiu D, Zaborski J. Factors influencing compliance with quarantine in Toronto during the 2003 SARS outbreak. *Biosecurity and bioterrorism: biodefense strategy, practice, and science*. 2004 Dec 1;2(4):265-72.
16. Koller DF, Nicholas DB, Golder RS, Gearing R, Selkirk EK. Bowlby and Robertson revisited: the impact of isolation on hospitalized children during SARS. *Journal of Developmental & Behavioral Pediatrics*. 2006 Apr 1;27(2):134-40.
17. Koller DF, Nicholas DB, Goldie RS, Gearing R, Selkirk EK. When family-centered care is challenged by infectious disease: pediatric health care delivery during the SARS outbreaks. *Qualitative health research*. 2006 Jan;16(1):47-60.
18. Effler PV, Carcione D, Giele C, Dowse GK, Goggin L, Mak DB. Household responses to pandemic (H1N1) 2009-related school closures, Perth, Western Australia. *Emerging infectious diseases*. 2010 Feb;16(2):205.
19. YoungMinds. Coronavirus: Impact on young people with mental health needs. 2020. Accessed 7th May 2020. [https://youngminds.org.uk/media/3708/coronavirus-report\\_march2020.pdf](https://youngminds.org.uk/media/3708/coronavirus-report_march2020.pdf)
20. Oosterhoff B, Palmer C, Wilson J, Shook N. Adolescents' Motivations to Engage in Social Distancing during the COVID-19 Pandemic: Associations with Mental and Social Health 2020. doi:10.31234/osf.io/jd2kq.
21. Asbury K, Fox L, Deniz E, Code A, Toseeb U. How is COVID-19 affecting the mental health of children with Special Educational Needs and Disabilities and their families? 2020. doi:10.31234/osf.io/sevyd.
22. Di Giorgio E, Di Riso D, Mioni G, Cellini N. The interplay between mothers' and children behavioral and psychological factors during COVID-19: An Italian study. 2020. doi:10.31234/osf.io/dqk7h.
23. Orgilés M, Morales A, Delvecchio E, Mazzeschi C, Espada JP. Immediate psychological effects of the COVID-19 quarantine in youth from Italy and Spain. 2020. doi: 10.31234/osf.io/5bpzf.
24. Sprang G, Silman M. Posttraumatic stress disorder in parents and youth after health-related disasters. *Disaster medicine and public health preparedness*. 2013 Feb;7(1):105-10.
25. Ministry of Social Welfare, Sierra Leone. Report of the Multisector Impact Assessment of Gender Dimensions of the Ebola Virus Disease (EVD) in Sierra Leone. Ministry of Social Welfare, Gender and Children's Affairs Sierra Leone; 2014. Accessed 7th May 2020. [https://awdf.org/wp-content/uploads/FINAL-REPORT-OF-THE-Multi-Sectoral-GENDER-Impact-Assessment-Launchedon\\_24th-Feb-2015\\_Family\\_kingdom\\_Resort.pdf](https://awdf.org/wp-content/uploads/FINAL-REPORT-OF-THE-Multi-Sectoral-GENDER-Impact-Assessment-Launchedon_24th-Feb-2015_Family_kingdom_Resort.pdf)

26. Kodish SR, Bio F, Oemcke R, Conteh J, Beauliere JM, Pyne-Bailey S, Rohner F, Ngnie-Teta I, Jalloh MB, Wirth JP. A qualitative study to understand how Ebola Virus Disease affected nutrition in Sierra Leone—A food value-chain framework for improving future response strategies. *PLoS neglected tropical diseases*. 2019 Sep;13(9)
27. Abramowitz SA, McLean KE, McKune SL, Bardosh KL, Fallah M, Monger J, Tehoungue K, Omidian PA. Community-centered responses to Ebola in urban Liberia: the view from below. *PLoS neglected tropical diseases*. 2015 Apr;9(4)
28. IrishAid and UNDP. Assessing Sexual and Gender Based Violence during the Ebola Crisis in Sierra Leone. 2015. Accessed 7th May 2020. [https://www.sl.undp.org/content/sierraleone/en/home/library/crisis\\_prevention\\_and\\_recovery/assessing-sexual-and-gender-based-violence-during-the-ebola-cris.html](https://www.sl.undp.org/content/sierraleone/en/home/library/crisis_prevention_and_recovery/assessing-sexual-and-gender-based-violence-during-the-ebola-cris.html)
29. Denis-Ramirez E, Sørensen KH, Skovdal M. In the midst of a 'perfect storm': Unpacking the causes and consequences of Ebola-related stigma for children orphaned by Ebola in Sierra Leone. *Children and Youth Services Review*. 2017 Feb 1;73:445-53
30. Griffiths AL, Armstrong D, Carzino R, Robinson P. Cystic fibrosis patients and families support cross-infection measures. *European Respiratory Journal*. 2004 Sep 1;24(3):449-52
31. Bol T. Inequality in homeschooling during the Corona crisis in the Netherlands. First results from the LISS Panel. doi: 10.31235/osf.io/hf32q
32. Nicholson NR. A review of social isolation: an important but underassessed condition in older adults. *The journal of primary prevention*. 2012 Jun 1;33(2-3):137-52
33. Arseneault L. Priorities for mental health science in a time of crisis and loss. Accessed 14th May, 2020. <http://mentalhealthresearchmatters.org.uk/priorities-for-mental-health-science-in-a-time-of-crisis-and-loss/>
34. Armitage R, Nellums LB. COVID-19 and the consequences of isolating the elderly. *The Lancet Public Health*. 2020 Mar 19.
35. Vijayaraghavan P, Singhal D. A Descriptive Study of Indian General Public's Psychological responses during COVID-19 Pandemic Lockdown Period in India. doi:10.31234/osf.io/jeksn
36. Shevlin M, McBride O, Murphy J, Miller JG, Hartman TK, Levita L, Mason L, Martinez AP, McKay R, Stocks TV, Bennett KM. Anxiety, Depression, Traumatic Stress, and COVID-19 Related Anxiety in the UK General Population During the COVID-19 Pandemic.
37. Lee A, Cho J. The impact of epidemics on labor market: identifying victims of the Middle East Respiratory Syndrome in the Korean labor market. *International journal for equity in health*. 2016 Dec;15(1):196.
38. Kennedy P, Hamilton LR. Psychological impact of the management of methicillin-resistant *Staphylococcus aureus* (MRSA) in patients with spinal cord injury. *Spinal Cord*. 1997 Sep;35(9):617-9.
39. Newton JT, Constable D, Senior V. Patients' perceptions of methicillin-resistant *Staphylococcus aureus* and source isolation: a qualitative analysis of source-isolated patients. *Journal of Hospital Infection*. 2001 Aug 1;48(4):275-80
40. Tarzi S, Kennedy P, Stone S, Evans M. Methicillin-resistant *Staphylococcus aureus*: psychological impact of hospitalization and isolation in an older adult population. *Journal of Hospital Infection*. 2001 Dec 1;49(4):250-4
41. Catalano G, Houston SH, Catalano MC, Butera AS, Jennings SM, Hakala SM, Burrows SL, Hickey MG, Duss CV, Skelton DN, Laliotis GJ. Anxiety and depression in hospitalized patients in resistant organism isolation. *Southern medical journal*. 2003 Feb 1;96(2):141-6
42. Bükki J, Klein J, But L, Montag T, Wenchel HM, Voltz R, Ostgathe C. Methicillin-resistant *Staphylococcus aureus* (MRSA) management in palliative care units and hospices in Germany: a nationwide survey on patient isolation policies and quality of life. *Palliative medicine*. 2013 Jan;27(1):84-90
43. Lee SM, Kang WS, Cho AR, Kim T, Park JK. Psychological impact of the 2015 MERS outbreak on hospital workers and quarantined hemodialysis patients. *Comprehensive psychiatry*. 2018 Nov 1;87:123-7
44. Cho AJ, Lee HS, Lee YK, Jeon HJ, Park HC, Jeong DW, Kim YG, Lee SH, Lee CH, Yoo KD, Wong AK. Post-traumatic stress symptoms in hemodialysis patients with MERS-CoV exposure. *BioPsychoSocial Medicine*. 2020 Dec;14(1):1-6
45. Dodgson JE, Tarrant M, Chee YO, Watkins A. New mothers' experiences of social disruption and isolation during the severe acute respiratory syndrome outbreak in Hong Kong. *Nursing & health sciences*. 2010 Jun;12(2):198-204
46. Odriozola-González P, Planchuelo-Gómez Á, Iruñtia-Muñiz MJ, de Luis-García R. Psychological symptoms of the outbreak of the COVID-19 crisis and confinement in the population of Spain. doi: 10.31234/osf.io/mq4fg
47. Lei L, Huang X, Zhang S, Yang J, Yang L, Xu M. Comparison of Prevalence and Associated Factors of Anxiety and Depression Among People Affected by versus People Unaffected by Quarantine During the COVID-19 Epidemic in Southwestern China. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*. 2020;26:e924609-1.
48. Lu H, Nie P, Qian L. Do Quarantine Experiences and Attitudes Towards COVID-19 Affect the Distribution of Psychological Outcomes in China? A Quantile Regression Analysis. *GLO Discussion Paper*; 2020.
49. Partnership for Evidence Based Response to COVID-19. 2020. Accessed 7th May 2020. <https://africacdc.org/news-item/new-report-provides-african-governments-real-time-information-and-guidance-to-find-the-balance-in-covid-19-response/>
50. Pellecchia U, Crestani R, Decroo T, Van den Bergh R, Al-Kourdi Y. Social consequences of Ebola containment measures in Liberia. *PLoS One*. 2015;10(12)
51. Chen NH, Wang PC, Hsieh MJ, Huang CC, Kao KC, Chen YH, Tsai YH. Impact of severe acute respiratory syndrome care on the general health status of healthcare workers in Taiwan. *Infection Control & Hospital Epidemiology*. 2007 Jan;28(1):75-9
52. Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styra R. SARS control and psychological effects of quarantine, Toronto, Canada. *Emerging Infectious Diseases*. 2004 Jul;10(7):1206

53. Lor JC, Barrett DH, Ortmann LW, Guibert DJ. Key ethical issues discussed at CDC-sponsored international, regional meetings to explore cultural perspectives and contexts on pandemic influenza preparedness and response. *International journal of health policy and management*. 2016 Nov;5(11):653
54. Straus SE, Wilson K, Rambaldini G, Rath D, Lin Y, Gold WL, Kapral MK. Severe acute respiratory syndrome and its impact on professionalism: qualitative study of physicians' behaviour during an emerging healthcare crisis. *Bmj*. 2004 Jul 8;329(7457):83
55. Veer IM, Riepenhausen A, Zerban M, Wackerhagen C, Engen H, Puhlmann L, Köber G, Bögemann S, Weermeijer J, Ušciško A, Mor N. Mental resilience in the Corona lockdown: First empirical insights from Europe. doi:10.31234/osf.io/4z62t

## Annex 1: Method

### Data sources

We conducted a systematic database search of PubMed/MedLine, PsycINFO, Embase, Cochrane Library, Campbell Reviews, Applied Social Sciences Index and Abstracts (ASSIA), International Bibliography of the Social Sciences (IBSS), and Educational Resources Information Center (ERIC) for articles written in English and published from database inception to 29 April 2020. The following search terms were used:

"social isolation" OR "social distancing" OR quarantin\*) AND ("disease outbreak" OR pandemic OR epidemic OR Coronaviridae OR Coronavirus OR COVID-19 OR SARS OR "severe acute respiratory syndrome" OR ebola OR "influenza virus" OR h1n1 OR "swine flu" OR h5n1 OR "avian influenza" OR "bird flu" OR MERS OR "middle east respiratory syndrome" OR "HIV/AIDS" OR MERS OR MRSA OR "health crisis" OR "emergency crisis" OR emergenc\* OR disaster\* OR "chemical spill" OR Chernobyl OR explosion OR Fukushima OR "industrial accident" OR "nuclear radiation" OR radiological OR "Three Mile Island"

To identify grey literature, we also searched the pre-print archives SoArXiv and PsyArXiv; Bielefeld Academic Search Engine (BASE); ProQuest, British Library Electronic Thesis Online Service; OpenGrey; Science.gov; and the World Health Organisation.

The search terms used and date the search was performed for each of these grey literature sources were as follows:

**SocArXiv (6 May 2020):** ("social isolation" OR "social distanc\*" OR quarantin\*) AND ("disease outbreak" OR pandemic OR epidemic OR Coronaviridae OR Coronavirus OR COVID\* OR SARS OR "severe acute respiratory syndrome" OR ebola OR "influenza virus" OR h1n1 OR "swine flu" OR h5n1 OR "avian influenza" OR "bird flu" OR MERS OR "middle east respiratory syndrome" OR MERS OR MRSA OR "health crisis" OR "emergency crisis" OR emergenc\* OR disaster\* OR "chemical spill" OR Chernobyl OR explosion OR Fukushima OR "industrial accident" OR "nuclear radiation" OR radiological OR "Three Mile Island")

**PsyArXiv (6 May 2020):** ("social isolation" OR "social distanc\*" OR quarantin\*) AND ("disease outbreak" OR pandemic OR epidemic OR Coronaviridae OR Coronavirus OR COVID\* OR SARS OR "severe acute respiratory syndrome" OR ebola OR "influenza virus" OR h1n1 OR "swine flu" OR h5n1 OR "avian influenza" OR "bird flu" OR MERS OR "middle east respiratory syndrome" OR MERS OR MRSA OR "health crisis" OR "emergency crisis" OR emergenc\* OR disaster\* OR "chemical spill" OR Chernobyl OR explosion OR Fukushima OR "industrial accident" OR "nuclear radiation" OR radiological OR "Three Mile Island")

**BASE (7 May 2020):** ab("social isolation" OR "social distanc\*" OR quarantin\*) AND ("disease outbreak" OR pandemic OR epidemic OR Coronaviridae OR Coronavirus OR COVID\* OR SARS OR "severe acute respiratory syndrome" OR ebola OR "influenza virus" OR h1n1 OR "swine flu" OR h5n1 OR "avian influenza" OR "bird flu" OR MERS OR "middle east respiratory syndrome" OR MERS OR MRSA OR "health crisis" OR "emergency crisis" OR emergenc\* OR disaster\* OR "chemical spill" OR Chernobyl OR explosion OR Fukushima OR "industrial accident" OR "nuclear radiation" OR radiological OR "Three Mile Island")

**ProQuest (7 May):** ("social isolation" OR ("social distance") OR quarantin\*) AND ("disease outbreak" OR pandemic OR epidemic OR Coronaviridae OR Coronavirus OR COVID\* OR SARS OR "severe acute respiratory syndrome" OR ebola OR "influenza virus" OR h1n1 OR "swine flu" OR h5n1 OR "avian influenza" OR "bird flu" OR MERS OR "middle east respiratory syndrome" OR MERS OR MRSA OR "health crisis")

**British Library Electronic Theses Online Service (6 May):** SARS OR MERS OR pandemic OR epidemic OR ebola OR influenza OR coronavirus

**OpenGrey (7 May 2020):** ("social isolation" OR "social distanc\*" OR uarantine\*) AND ("disease outbreak" OR pandemic OR epidemic OR Coronaviridae OR Coronavirus OR COVID\* OR SARS OR "severe acute respiratory syndrome" OR ebola OR "influenza virus" OR h1n1 OR "swine flu" OR h5n1 OR "avian influenza" OR "bird flu" OR MERS OR "middle east respiratory syndrome" OR MERS OR MRSA OR "health crisis" OR "emergency crisis" OR emergenc\* OR disaster\* OR "chemical spill" OR Chernobyl OR explosion OR Fukushima OR "industrial accident" OR "nuclear radiation" OR radiological OR "Three Mile Island")

**Science.gov (7 May 2020):** ((quarantine or social isolat\* or social distanc\*) and disease outbreak or pandemic or epidemic or Coronaviridae or Coronavirus or COVID\* or SARS or severe acute respiratory syndrome or ebola or influenza virus or h1n1 or avian influenza or h5n1 or bird flu) OR MERS or middle east respiratory syndrome or MRSA or health crisis)

**World Health Organisation (3 May 2020):** quarantine AND disease outbreaks; social distancing AND disease outbreaks; social isolation AND disease outbreaks

### Study selection

The screening of titles and abstracts of all published articles was shared by two authors (CGA and RL). Excluded studies were then additionally screened (by CW and CE) before reviewing the full text of potentially eligible studies. Table 1 describes the inclusion and exclusion criteria used.

### Data extraction

Four authors (CGA, CW, CE, RL) extracted data from included studies. Extracted information included lead author; date; title; country; pandemic / disaster; aims; study design; study population and baseline characteristics; sample size; recruitment method; exposure (type of quarantine, setting, duration); outcomes measured; key findings; limitations; implications for clinical practice.

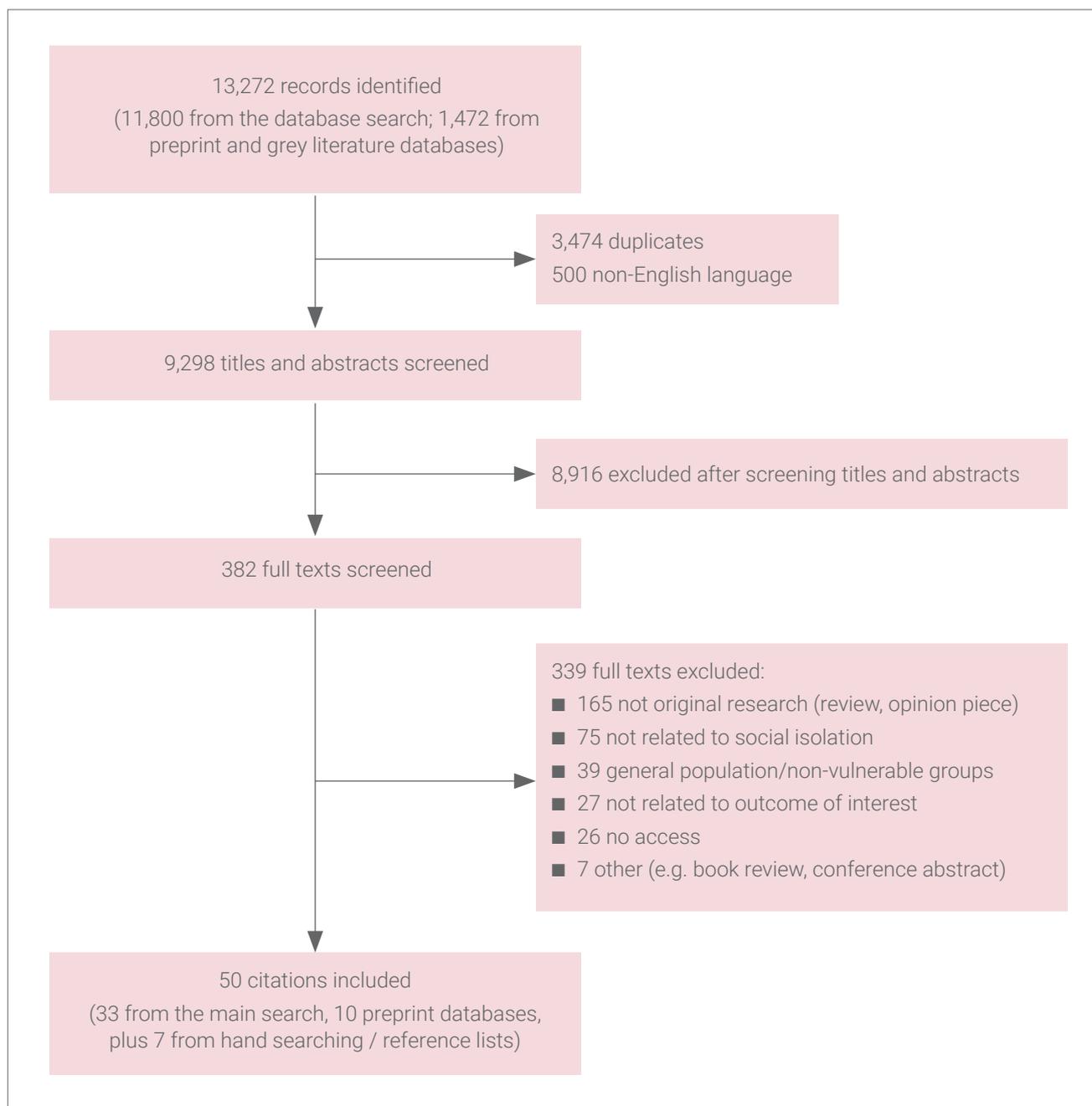
### Results

Figure 1 shows the flow of the literature screening and selection, which results in identification of 50 studies eligible for inclusion in the review.

**Table 1: Inclusion and Exclusion Criteria**

	Inclusion criteria	Exclusion criteria
Population	All individuals who might be regarded as belonging to a socially disadvantaged / vulnerable group, who are living in community or non-community settings (e.g. nursing homes, assisted living facilities)	Individuals who would not be considered as belonging to a socially disadvantaged / vulnerable group and/or those living in hospital or prison settings
Study design	Quantitative observational studies, qualitative studies, intervention studies	Conference abstracts, reviews, commentaries, editorials, letters
Exposure / intervention	Social isolation / social distancing / quarantine (i.e. prolonged and enforced lack of all physical contact with people outside of one's own household) in the context of epidemics, pandemics, and other public health crises (e.g. industrial accidents). This includes, but not limited to, COVID-19, other coronavirus infections, SARS virus, Ebola / haemorrhagic fever, Avian flu (H5N1 subtype), Swine Flu (H1N1 subtype), MRSA, MERS virus, HIV/AIDS, as well as industrial accidents such as Chernobyl, Fukushima, Three Mile Island.  Intervention studies: Studies that investigate the impacts of interventions that aim to improve / mitigate the effects of social isolation / social distancing measures.	Social isolation that is due to reasons other than public health containment measures (e.g. isolation resulting from stigma)
Outcomes	Health outcomes: mental health, loneliness, physical health, mortality Social outcomes: education, work, income, relationships. For quantitative observational studies and qualitative studies, the impact of the exposure on the outcome is broadly defined and includes (but is not limited to) prevalence, severity, perceived impact / burden. For intervention studies, impact is defined as changes in outcomes using appropriate measurement instrument, between the start and end of an intervention / between intervention and control groups.	

**Figure 1. Flowchart of literature identification and selection**



## Annex 2: Results table

Author (Year)	Country	Pandemic/ Disaster	Study design	Participants	Quarantine description	Quarantine duration	Methods/Outcome measures	Key findings
Abramowitz et al (2015) [27]	Liberia	Ebola	Qualitative	n, 368 community leaders in 15 communities in Monrovia and Montserrat County (epicentre of Ebola outbreak)	Enforced home quarantine of individuals suspected of being in contact with a positive case	21 days	Focus groups and field notes to explore the effectiveness of virus containment methods	Community leaders reported that after parents infected with Ebola had been removed to hospital or had died, their children were placed under community quarantine for 21 days. During this time many babies and children didn't survive the quarantine periods, as no one was able/ willing to provide care to them for fear of contracting the virus. Respondents reported that community health messaging failed to provide the kinds of 'higher order' practical information and training that communities were desperate for during the outbreak, e.g. "How do I manage a family of children, including infants and toddlers, in quarantine?"
Asbury et al (2020) [21]	UK	COVID-19	Qualitative	n, 241 parents or carers of school-aged children with special educational needs and disabilities (SEND)	Community 'stay at home' recommendations and school closures	Data collected during quarantine, 2-3 weeks after lockdown	Content analysis of free text for question: "Please describe in your own words how the coronavirus outbreak is affecting your mental health and your child's mental health"	Large proportion of families reported that COVID-19 has affected their mental health, often leading to increases in anxiety/fear. Some also reported increases in distress, low mood and stress. Six themes were apparent from answers: Worry (for self, others, and general worry); Loss (of routine, support network and structures, specialist input, financial loss); Mood, Emotions & Behaviour (low mood, acting out, behaviour change); Knowing what is going on (awareness/understanding among children); Overwhelmed (stress at being able to meet demands on them); Minimal or Positive Impact (particularly for families with SEND children who feel safer/prefer to be at home).
Bai et al (2004) [2]	Taiwan	SARS	Cross-sectional survey	n, 338 hospital staff in a 2,500 bed psychiatric teaching hospital, of whom 41 (12%) were quarantined.	Individual home quarantine for staff who had come in contact with a suspected SARS case	9 days	Stress reactions: Study specific survey composed of acute stress disorder criteria (DSM-IV), and related emotional and behavioural changes	Differences between quarantined and non-quarantined staff were found for exhaustion (32% vs 13%), detachment from others (22% vs 8%), anxiety when dealing with febrile patients (33% vs 14%), irritability (15% vs 4%), insomnia (22% vs 9%), poor concentration and indecisiveness (18% vs 6%), afraid to go home in case infect family (34% vs 13%), deteriorating work performance (20% vs 5%), reluctant to work or considered resignation (24% vs 5%); stigmatisation in neighbourhood (34% vs 17%), met criteria for acute stress disorder (17% vs 4%). Quarantine was the strongest factor related to acute stress reactions.
Bol (2020) [31]	Netherlands	COVID-19	Cross-sectional online survey	n, 768 parents providing info on n, 1318 children	Community 'stay at home' recommendations and school closures	8 weeks	Study specific survey to assess parents' perceived level of support from schools for children to do work at home; how they support their children; extent of support required	All parents reported it was important for their children to keep up with schoolwork but social inequalities exist; children with more advantaged parents receive more support and have more material resource to help them at home (e.g. their own computer). Differences driven by parental ability to help, parents with higher education levels feel more able to help with schoolwork. Schools supporting children in vocational track offer less distant support than schools supporting children in academic track. Parents feel more able to support daughters than sons.
Bükki et al., (2013) [42]	Germany	MRSA	Cross sectional survey	n, 229 representatives at palliative care units (PCU) and hospices	Patient isolation in palliative care units and hospices of patients with known or suspected MRSA infection	Unclear	Study specific survey; 23-item questionnaires (infrastructural data: 6 items; management process: 14 items; clinical significance: 3 items)	Adherence to an existing MRSA protocol was reported to be stricter by the responding PCUs than the hospices (46% vs 27%). Negative impact of these protocols on the quality of life of the affected patients was estimated higher by PCU staff than by hospice staff (83% vs 55%); in particular, social deprivation and emotional barriers were reported as effects of isolation.

Catalano et al. (2003) [41]	USA	MRSA	Longitudinal survey	n, 27 hospitalised patients, isolated because of MRSA, and 24 non-isolated control patients (at baseline)	Hospital patient isolation of individuals with MRSA infection	Data collected within 48 hours of being isolated, and at 1 week and 2 weeks of isolation	Anxiety: HAM; Depression: HAD	For isolated cases, depression and anxiety scores increased from baseline across the two weeks, whilst for the controls (non-isolated patients), scores decreased across the two follow up time points.
Chen et al (2007) [51]	Taiwan	SARS	Longitudinal survey	n, 90 healthcare workers	Individual home quarantine following period of on-duty care with hospitalised SARS patients	2 weeks	General health status: MOS-SF-36 [collected at baseline, immediately after care of SARS patients, and 4 weeks later (following quarantine, and 2 weeks of off-duty shifts)]	Differences between baseline and 4 week follow-up: improved social functioning, and increases in scores on role limitations due to emotional problems, and role limitations due to physical problems. Non-significant minor decrease in physical functioning over the four week time period. No difference before and after quarantine / off-duty care in scores on bodily pain, vitality, general health, or mental health.
Cho et al (2020) [44]	South Korea	MERS	Cross-sectional survey	n, 89 hospitalised haemodialysis patients who were exposed to MERS infected patients and isolated	Hospital quarantine: Single room isolation, cohort isolation in hospital, self-quarantine	Mean 14.8 days	Post-traumatic stress symptoms: IES-R Korean version	17.9% participants reported IES-R-K scores $\geq 18$ (22.5% of those were in a single-room isolation group, 15.8% in a cohort-isolation group and none of the subjects in the self-imposed quarantine group). Women and patients who had a shorter duration of isolation were more likely to have IES-R-K $\geq 18$ . Avoidance, sleep disturbance, emotional numbing, and dissociation subscale scores were higher in participants who had been isolated for less than 16 days, compared to those isolated for 16 days or more.
Denis Ramirez et al (2017) [29]	Sierra Leone	Ebola	Qualitative	n, 24 children; n, 4 key stakeholders working with children orphaned by Ebola	Individual home quarantine for individuals who had contact with a suspected Ebola case	Up to 21 days	"Draw and write" method to examine children's social representations of peers orphaned by Ebola. Semi-structured interviews with key informants covering the psychosocial impact of the epidemic, community and family support, and stigma of children orphaned by Ebola	The 'need to contain' Ebola, was a prominent feature in much of the data, and in children's conceptualisations of how Ebola affects children. Quarantining suspected Ebola cases and stigma secondary to this carried significant signal value for children. Awareness of the 'no touching' policy had a strong presence in both the children's drawings and captions as well as interviews with non-governmental organisation (NGO) representatives.
Desclaux et al (2017) [11]	Senegal	Ebola	Qualitative	n, 43 'contact cases' quarantined for coming into contact with suspected Ebola case; n, 27 community volunteers who 'monitored' the contact cases on a daily basis	Individual home quarantine for individuals who had contact with a suspected Ebola case	21 days	Semi-structured interviews to examine the experience of being quarantined, and monitoring those quarantined	Four themes arose: 1) a biosafety precaution: all contact cases reported anxiety induced insomnia, constantly monitoring themselves. Health care workers (HCWs) were particularly concerned about spreading illness to unaffected household members. 2) Interruptions to professional activity: Among contact persons, 55 had to interrupt their professional activities with no advanced planning. Social effects of this suspension were economic and changes in roles and social status. Difficulties due to having very precarious employment. Many felt the amount of financial assistance received was insufficient/came too late. 23/30 HCWs didn't receive wages and got no compensation, so became dependent on families, which caused conflicts. 3) Stigma attached to Ebola: Due to stigma, 3 people were unable to resume jobs once surveillance ended, or if self-employed, there was a delay in their regular clientele returning. 4) An order and a social obligation: HCWs, especially those with greater knowledge of Ebola, felt that the quarantine measures weren't merited.

Di Giorgio (2020) [22]	Italy	COVID-19	Cross-sectional online survey	n, 245 parents of pre-school age children	Community 'stay at home' recommendations and school closures	Data collected during quarantine, 3 weeks after lockdown	Sleep Quality: PSQI, Sleep Disturbance Scale for Children; Time perception: STQ; Emotional and behavioural difficulties in children: SDQ	Mothers' sleep quality and timing markedly changed since lockdown. Children's sleep quality was less affected by lockdown, although their sleep timing strongly shifted. Compared to the period before quarantine, mothers perceived their children as more undisciplined and hyperactive, with a worsening inhibitory self-control capacity. The factor with greatest impact on both mothers' and children's psychological well-being was their sleep quality. For mothers who started working in smart modality, behavioural factors had a critical role in predicting their child's inhibitory self-control capacity. For mothers who had stopped working, their children's behaviours seemed to be strongly predicted by the mothers' worsening sleep quality and emotional symptoms. For mothers who did not work, behavioural factors related to COVID-19 restrictions did not influence mothers' subjective perception of their children's psychological outcome. Finally, mothers who continued to work regularly did not report marked changes in their children.
DiGiovanni et al (2004) [15]	Canada	SARS	Mixed methods	i. n, 35 public health officials, hospital physicians, administrators, business leaders, government officials, journalists, community members, school teachers; ii. n, 1,509 Toronto residents; iii. n, 195 quarantined healthcare workers (HCWs); iv. n, unknown (residents, hospital staff particularly affected by the quarantine measures)	Widespread individual home quarantine due to contact with possible SARS patient (estimates vary between 15,000 and 30,000 individuals being quarantined in the Greater Toronto Area). People were told to limit association with others in the household, to wear surgical masks when others were present, and not to leave their homes.	Difference between incubation period of SARS (10 days) and the time that had elapsed since their exposure to the SARS patient	i. Unstructured interviews ii. Telephone polls iii. Structured interviews iv. Focus groups Authors grouped results from all four methods into themes: 1) Why people complied; 2) obstacles to compliance	For HCWs: 5% reported high stress that they were tempted to break quarantine, 34% were "pretty stressed" but not tempted to break quarantine, 33% were "uncomfortable but not overly" stressed, 16% were mildly uncomfortable, 11% said stress wasn't a problem. Of 161 HCWs who shared household with others during quarantine, about equal number thought presence of others had been helpful or had no effect on stresses of quarantine. 19% reported presence of others had added to the stress. Emotional reactions to social distancing were reported as fear, isolation, loneliness, depression, insomnia, and anxiety. Boredom was cited as greatest emotional disincentive to compliance. 68% of 195 quarantined HCWs reported that stigma affected them or someone close to them. Focus group participants who were quarantined reported that they and their families often felt stigmatised, even after 10 day period ended. Reported unwanted attention, ridicule, avoidance, and withdrawn invitations from social events, e.g. children's birthday parties and family reunions. Their children were unwelcome in some day-care centres, and some spouses of quarantined HCWs were sent home from work.
Dodgson et al (2010) [45]	Hong Kong	SARS	Qualitative	n, 8 mothers who delivered healthy newborn infants during the SARS outbreak	Home quarantine. Residents warned against public activities unless absolutely necessary and then only with strict hygiene measures including wearing face masks, vigilant hand washing, and avoiding touching publicly used common areas	Unclear	Interviews to explore experiences of being pregnant and delivering baby during SARS epidemic	4 themes emerged: 1. Living with uncertainty: feelings of doubt, confusion about their physical, emotional, and financial wellbeing. All participants stated they received no recommendations from doctors about what they should do, not do, which was frustrating, and added to their high anxiety about safety of baby. Continuous financial burden, and decreases in income, and increases in costs due to changes in their daily lives. 2. Intense vigilance: confining feeling of living in a small apartment; in home hygiene measures that participants implemented helped to have some control over an unpredictable situation. 3. Forced social isolation: feeling paralyzed with fear about going out, not sleeping, cancelling social events, felt isolated from, and a lack of personal connection with, health care providers, both in and out of hospital. Less than optimal care during birthing. 4. Disrupted expectations: overwhelming disruption in their expectations about prenatal, intra-partum and post-partum experiences. Confusion, anxieties, fears were heightened by the multiple mixed and changing messages that were provided by public health officials.

Effler et al (2010) [18]	Australia	H1N1	Cross-sectional survey	n, 233 parents of students who were affected by school closures at three schools	Home quarantine for children during school closures	1 week	Study specific survey to describe the activities of students affected by school closure, the effect of school closure on families, and parental opinions regarding school closures implemented	74% students reported going outside the home during the school closure period. The number of out-of-home activities (e.g. sporting events, outdoor recreation, shopping, and parties) reported by individual students ranged from 0 to 24 (median 3 activities). 90% parents reported that school closure caused minimal or no anxiety for their child, but 55% reported that school closure caused moderate or severe disruption to family routines.
Gershon et al. (2016) [13]	Africa/US	Ebola	Qualitative	n, 16 healthcare workers returning home to the US after deployment to an Ebola outbreak in West Africa	Mandatory home quarantine after returning to the US	21 days	Semi-structured interviews to assess health care volunteers' experiences and psychosocial impacts associated with deployment to the West African Ebola epidemic	Participants felt a sense of isolation, depression, stigmatisation, interpersonal difficulties and extreme stress. One participant mentioned that the 21 day quarantine was "the most stressful part of the whole thing". Another mentioned losing friends during quarantine, and many had not had any physical contact for months, which was a problem for some participants. Another reported remaining alone after 21 days quarantine ended as they did not want to see anyone as they were 'so used to being alone'.
Griffiths et al. (2004) [30]	Australia	Pseudomonas aeruginosa (PA)	Cross-sectional postal survey	n, 190 children / parents of children who are under the care of a specific cystic fibrosis clinic where there was an outbreak of PA	Cohort segregation measures introduced in a particular cystic fibrosis unit at a hospital after a virulent epidemic strain of PA was isolated to prevent cross-infection. Doctors also strongly advised patients & families not to have any contact with other cystic fibrosis (CF) families in the community	Unclear	Unvalidated study specific survey to measure general feelings and attitudes (8 items)	Parents' overall response to segregation measures was positive in 85%, negative in 4% and unsure in 11% of cases. Positive comments: less stress from a parental view when attending clinics, a feeling that PA-negative children cough less and take less antibiotics than they used to, and requests for further infection control information and advice about measures to be taken in the community. Negative comments: emotional impact of their children not socialising with other CF children, inconclusive evidence about person-person spread of infection and feelings of alienation created in the clinics by the separation. Children's responses: Children were positive in 63%, negative in 12%, and unsure in 25% of cases. Children who gave free text responses predominantly reported missing their other CF friends, who they had been separated from during inpatient stays.
Hawryluck et al (2004) [52]	Canada	SARS	Cross-sectional mixed methods online survey	n, 129 Toronto residents, 88 (68%) of whom were healthcare workers	Widespread individual home quarantine due to contact with possible SARS patients. People were told to limit association with others in the household, to wear surgical masks when others were present, and not leave their homes.	10 days (median)	Post-traumatic stress: IES-R; Depression: CES-D; Thematic analysis of free text questions on most difficult aspects of quarantine	Scored above cut-offs: PTSD: 28.9%; Depression: 31.2%. Lowest income groups associated with higher PTSD scores, and higher depression scores. No association between depression / PTSD scores and age, level of education, healthcare worker status, living with other adult household members, having children. Duration of quarantine associated with increased PTSD and depression symptoms. Qualitative: sense of isolation, lack of contact with others, particularly family was most difficult. Confinement in the home, or between work and home, not being able to shop for basic necessities, or acquire prescribed medications, lead to enhanced sense of distance from outside world. Felt particularly stigmatised by close others following quarantine.

Irish Aid and UNDP (2015) [28]	Sierra Leone	Ebola	Qualitative	n, unclear; personnel working for organisations supporting women and girls, and young men and women	Social distancing measures and school closures	Unclear	Interviews and focus groups to explore how correlates of Ebola outbreak influenced sexual and gender- based violence against women and girls	Social distancing measures and school closures perceived to have contributed to increase in physical and sexual abuse of women and children at home, and to have increased difficulties in reporting instances of abuse.
Kennedy & Hamilton (1997) [38]	UK	MRSA	Cross-sectional matched control study of MRSA positive patients with MRSA negative patients	n, 16 patients with a traumatic spinal cord injury, isolated due to being MRSA positive at a specific UK hospital; Control group was matched for age, sex, level of injury, and time since admission or injury	Hospital isolation whilst they remain positive for MRSA, which may be for 2 to 3 months. Such patients have reduced access to a rehabilitation programme, and to other patients. All visitors and staff must be gloved and gowned before entering the isolation room and must adopt general infection control procedures	At least 2 weeks when the survey was administered	Depression: BDI; Anxiety: SAI; Mood: POM. Also a semi- structured interview schedule was used to collect information specific to patients' experiences of MRSA induced isolation	MRSA positive group scored higher than MRSA negative group in each questionnaire. Only significant difference between the two groups was that the MRSA group feel more angry. Semi structured interview: 69% believed their rehabilitation had been adversely affected. Isolation affected the mood of 50% of the group; one person reported being in a better mood, due to feeling more relaxed. 30% of the respondents thought that isolation helped their adjustment to the injury, whereas 10% found isolation detrimental to adjustment. Relationships were not affected for 60% of the group, and 20% found that the privacy as a result of isolation helped their relationships.
Kodish et al (2019) [26]	Sierra Leone	Ebola	Qualitative	n, 42 government stakeholders, managers from NGO and United Nations agencies, Ebola survivors, healthcare workers, community leaders	Individual home quarantine for individuals suspected of being in contact with an Ebola case; social distancing measures	21 days	In-depth semi-structured interviews to examine the impact of Ebola on the nutrition sector in Sierra Leone	Due to intense household and community quarantines, work in the country "came to a halt". As a consequence, food security and nutrition were negatively impacted: Great losses in harvest from reduced manpower, and people being quarantined unable to assist in cultivation. Quarantine was particularly difficult for rural community members because agricultural activities were described as largely communal in nature. Especially in quarantined household, participants explained that stored foods needed to last for longer periods than usual since food sharing and barter were not possible. Two most frequently mentioned coping strategies to feed young children included food substitutions with more affordable, yet less nutritious options, and food quantity reduction due to lack of food access.
Koller et al (2006a and b) [16, 17]	Canada	SARS	Qualitative	i. n, 5 hospitalised children with probable or suspected SARS; ii. n, 10 parents of hospitalised children; iii. n, 8 paediatric health care providers	Hospital quarantine / isolation	Unclear	Interview to examine the experiences and perspectives of children hospitalised because of SARS, their parents and paediatric health care providers	Children, parents, and health care providers all expressed various levels of emotional distress as a result of isolation procedures, describing sadness, loneliness, worry, and fear. For children, sadness was often experienced, attributed to feeling alone and missing and/or worrying about family members. For one health care provider, loneliness was experienced due to the segregation that resulted from being a health care provider during the SARS outbreak. Parents expressed anger and discomfort at not being able to care for their child as they normally would. Parents felt forced to relinquish both their parental role and their nurturing presence. Parents reported that child participants exhibited certain behaviours, even several months after discharge, e.g., showing signs of distress when parents left home to go to work (i.e., clinging to parents, crying). Some parents cited positive changes in their family life after the outbreaks (e.g. being more physically demonstrative with one another).

Lee & Cho (2017) [37]	Korea	MERS	Quantitative big data	n, approximately 33,000 households relating to Korean population of working age (aged 15-70)	Large scale home quarantine (roughly 17,000 individuals were quarantined across Korea during the outbreak)	14 days	Unemployment: data obtained from the Economically Active Population Survey (EAPS), the official monthly labour force survey of Korea	Urban areas (where majority of quarantined people were) showed an increase in unemployment among those aged 50+ years after the onset of MERS epidemic. Findings suggest in urban areas the vulnerable group (aged 50+) experience a direct impact of the contagious disease on employment whereas in rural areas, the impact was indirect, caused by a slowdown in demand for consumption.
Lee et al (2018) [43]	Korea	MERS	Cross-sectional survey	i. n, 359 hospital workers; ii. n, 73 hospital patients who require haemodialysis and were exposed to MERS	i. Individual home quarantine ii. Hospital quarantine	i. Unclear ii. Up to 28 days	i. Post traumatic stress symptoms: IES-R Korean version; ii. Depression and Anxiety: HAM, HAD and MINI	Hospital workers: No differences in IES-R scores between workers who experienced quarantine and those who did not, in the first survey. Patients: Anxiety (8+ score on HADS) = 11%; Depression (8+ score on HADS) = 15.1%; Major depressive disorder (5+ score on MINI) = 5.5%; general anxiety disorder (3+ score on MINI) = 11%; panic disorder (4+ score on MINI) = 0 patients; social anxiety disorder (4+ points on MINI) = 0 patients.
Lor et al (2016) [53]	Multiple	Pandemic influenza	Qualitative	Four regional meetings attended by government health officials, policy-makers, public health practitioners, scientists, epidemiologists, philosophers, ethicists, religious leaders, and representatives of international aid and health organizations	Home quarantine, school closures, social distancing measures	n/a	Documentary analysis of CDC (Centre for Disease Control) meetings worldwide to identify key ethical challenges for pandemic influenza response described in the World Health Organization's (WHO's) guidance	Noted difficulties of observing quarantine/social isolation for people living in slums and refugee camps, and of likelihood of need for military enforcement in Africa which may put people at risk of unnecessary force. Risk of stigmatization of patients and family members placed in isolation and quarantine. Poverty limits ability to isolate – difficult for patients to remain in isolation wards or for potentially exposed individuals to remain quarantined for long period of time unless compensation can be offered for lost wage. Risk of people monopolising on distancing/quarantine measures, using them as an excuse to discriminate against minority groups.
Lu et al (2020) [48]	China	COVID-19	Cross-sectional online survey	n, 1849 general population adults	Community quarantine, where village / community where respondent resides is blocked. Though many people also experienced home quarantine	Unclear	Depression, 9 items developed from the CES-D scale. Happiness, 1 item "all things considered, how happy are you with your life as a whole?"	Controlling for all other variables, self-reported good health was associated with lower depressive symptoms, poor family (low income) associated with higher depressive symptoms, no effect of age. Older age and low income associated with lower happiness levels, self-reported good health was associated with higher happiness.
Marjanovic et al (2007) [7]	Canada	SARS	Cross-sectional online survey	n, 333 nurses	Working in quarantine or 'full quarantine' due to SARS exposure'. No more details regarding setting.	Unclear	Emotional exhaustion: MBI-GS; State anger: STAXI-2. Six study specific questions to assess avoidance behaviour.	Time spent in quarantine significantly predicted state anger among nurses, but not emotional exhaustion, after controlling for nurses contact with SARS patients, level of vigour, trust in equipment/ infection control, and organisational support.

Maunder et al. (2003) [10]	Canada	SARS	Qualitative	n, 9 healthcare workers	Infection control measures: staff members were discouraged from interacting outside the hospital with colleagues, & staff meetings were discouraged. Eating/drinking which requires removing mask were done alone or outside. Quarantine (setting not clear) for hospital staff for potential contact with a SARS patient.	10 days	Unstructured interviews to explore the psychological and occupational impact on staff and hospital inpatients in a hospital in the first 4 weeks of the outbreak	Health care workers response: Quarantined staff expressed concerns about their personal safety, about transmitting the disease to family members, about stigmatization, and about inter-personal isolation. Patients with SARS: They often had to spend several hours alone between brief contacts with staff. Outside communication was available by telephone and, in some cases, by email. As a result, patients with mild symptoms complained of boredom and loneliness. Most expressed sadness about missing their loved ones.
McMahon et al (2016) [14]	Sierra Leone	Ebola	Qualitative	n, 35 frontline healthcare providers	2/8 facilities underwent quarantine, other measures included social and physical distancing	21 days	Semi-structured interviews to assess how frontline providers experienced and assessed the changes in their professional, personal and social lives during the Ebola outbreak	Healthcare workers reported quarantine and social distancing measures led to feelings of stigmatisation/being ostracised, feeling socially isolated due to separation from their communities, reduced social connectedness at work, stigma of them and their children (by association), feeling of loneliness, isolation and sadness.
Ministry of Social Welfare, Sierra Leone (2014) [25]	Sierra Leone	Ebola	Mixed methods	n, 2788 households within districts across Sierra Leone affected with Ebola; households had a total 16,520 persons	Post-quarantined households – Home quarantine militarily enforced	Unclear	Interviews, focus group discussion, surveys; Topic guide not described	Women reported that quarantine significantly reduced economic and livelihood activities, which in turn had reduced employment, boosted poverty rates, and increased food insecurity. Some girls, in their new role to provide care (e.g. sourcing food and fuel) caused breaches of the quarantine. Women and girls in quarantined homes had to negotiate with military/police guards to leave their homes to fetch water or firewood; negotiation included paying the guards with money or in kind (sexual favours or giving food or other valuables). More than 65% of female respondents reported manipulation by the guards stationed at their homes. In addition, due to abandoned health facilities, quarantine, and reduced use of conventional health services for fear of infection, pregnant women were more likely to give birth unattended and forego ante and post-natal care.
Newton et al. (2001) [39]	UK	MRSA	Qualitative	n, 19 patients with MRSA	Hospital quarantine – patients isolated in a side-room	At the time of the interview, participants had been isolated for between 3 and 77 days (mean=19; S.D=20).	Semi-structured interview to explore patient's perceptions of MRSA and their understanding and experience of source isolation and barrier nursing.	Isolation was perceived to have both positive and negative aspects by participants. The positive characteristics identified were greater freedom from routine (N=4), greater privacy and solitude (N=4), and the perception that visitors were given greater freedom (N=2). The negative characteristics were a lack of attention from nursing staff (N=4) and loneliness (N=3).

Odriozola-Gonz et al (2020) [46]	Spain	COVID-19	Cross-sectional online survey	n, 3550 general population adults	Lockdown, whole community home 'quarantine', social distancing	Data collected during quarantine, 2 weeks after lockdown	Depression and Anxiety: DASS; Post traumatic stress symptoms: IES	Symptomatic scores of anxiety, depression, stress were observed in 32.4%, 44.1% and 37.0% of respondents, respectively. Also, symptomatic scores indicating psychological stress were found in 88.6% of respondents. Increased prevalence of anxiety, depression and stress symptoms was associated with female sex, younger age, self-reported COVID-19 symptoms, previous psychological or psychiatric treatment, intake of psychoactive medication and negative effect on social relationships and relationships with people living in the same place. Higher scores related to symptoms of posttraumatic stress disorder was associated with most of those factors, and also with knowing a COVID-19 patient.
Oosterhoff et al (2020) [20]	USA	COVID-19	Cross-sectional online survey	n, 683 adolescents aged 13 to 18 years old	Social distancing measures	Data collected during quarantine, 2 weeks after COVID-19 was declared a national emergency in the United States	Social distancing and motivation for social distancing; Anxiety and depression: PROMIS; Belongingness and Burdensomeness: adapted from INQ	Engagement in social distancing was not associated with adolescents' mental or social health. However, specific motivations for social distancing were differentially associated with adolescents' anxiety symptoms, depressive symptoms, burdensomeness, and belongingness. Youth who were social distancing because they did not want to personally get sick or because they wanted to avoid judgment reported greater anxiety symptoms. Further, those who were social distancing because they would have otherwise preferred to stay home reported less anxiety symptoms. Youth who engaged in social distancing because a friend told them they should reported greater depressive symptoms. Those who were social distancing because they would have otherwise preferred to stay home reported lower depressive symptoms. Youth who were social distancing because they did not want get personally sick reported lower feelings of burdensomeness and those who were social distancing because their parents made them reported greater belongingness.
Orgilés et al (2020) [23]	Italy and Spain	COVID-19	Cross-sectional online survey	n, 1143 parents of children aged 3 to 18 years	Lockdown, whole community home 'quarantine', social distancing	Data collected during quarantine, unclear how long after lockdown	Study specific survey to examine emotional wellbeing (parent report) on how quarantine emotionally affects children through 31 symptoms ranging from 1 (much less compared to before quarantine) to 5 (much more compared to before quarantine)	85.7% of the parents reported changes in their children's emotional state and behaviours during the quarantine. The most frequent symptom was difficulty concentrating (76.6%). Spanish children were more affected than Italian children in most symptoms. 11.4% of the Italian and Spanish parents informed that family coexistence was difficult or very difficult. Parents' perception of COVID-19 seems to be related to their child's psychological symptoms during the quarantine. When family coexistence during the quarantine was more difficult, the situation was more serious, or the level of stress was higher, parents tended to report more emotional problems in their children; specifically, primary caregiver level of stress was related to 25 of the 31 child symptoms.

Partnership for Evidence Based Response to COVID-19 (PERC) (2020) [49]	Africa	COVID-19	Mixed methods	n, 20,990 adults	Multiple in different areas, ranging from social/physical distancing to stay-at-home quarantine	Unclear/variable; responses from states which had not yet initiated social distancing/quarantine measures also included	Survey data, documentary analysis of print and social media, mobility data from Google, epidemiological data, to assess ability to/compliance with social distancing/quarantine measures	50% respondents estimated they would run out of money and food in a week or less. The lowest-income households expected to run out sooner. In Nigeria and Kenya, social media users noted that hunger in urban centres was forcing them to violate stay-at-home orders in order to search for food. 59% reported they lack physical space to isolate sick people: in 12/20 Member States, fewer than half of respondents said they had a separate room to isolate someone who is ill. 20% of respondents opposed home isolation for infected people, though this varied by region. 16% opposed the requirement for those who came into contact with infected people to self-quarantine. As COVID-19 caseloads grew and restrictions were imposed, so did the number of related security incidents (e.g. violent/non-violent protests). The three most common motives for non-violent protests were to demand better protection for health workers, to call attention to the economic and food insecurity effects of public health and social measures, and to demand increased government support to mitigate them.
Pellechia et al (2015) [50]	Liberia	Ebola	Qualitative	i. n, 45 ii. N, 432 iii. N, 30 In all, individuals who were particularly affected by the epidemic (public transportation workers, market sellers, healthcare workers, political and religious leaders, Liberian secret society representatives)	State enforced home quarantine of affected areas and households	21 days	i. Participant observation; ii. Focus groups; iii. Semi-structured interviews Assessed 1) community's reaction to the epidemic; 2) funerary and burial practices before and during the epidemic, and opinions on cremation; and 3) health-seeking behaviours and perception of quarantine.	Concerns about a lack of communication and awareness raising, and concerns about burial. Quarantine broke social networks of solidarity and raised concerns about gaps in implementation as it was not imposed consistently. There was only intermittent distribution of food, water and other items which meant that people were forced to disobey the quarantine measures. Being quarantined led to increased stigmatisation, and being publically labelled. Being quarantined led to panic, fear and disenfranchisement of minority groups, increase in suspicion and mistrust, and also acted as a barrier to seeking help for health problems – people kept their illnesses a secret for fear of exacerbating stigma and alienation.
Reynolds et al (2008) [6]	Canada	SARS	Cross-sectional mailed survey	N, 1057 general population (including n, 269 healthcare workers (HCWs))	Home quarantine for potential SARS cases	Duration of quarantine was 8.3 days for general population. For health care workers specifically, mean duration of quarantine = 8.7 days	Post-traumatic stress symptoms: IES-R.	Compared with non-HCW, HCW felt greater stigmatization (i.e. people reacted differently), lost income and were consistently more impacted psychologically - they reported more anger, annoyance, fear, frustration, guilt, helplessness, isolation, loneliness, nervousness, sadness, worry, and less happiness. Health care workers also reported significantly more IES-R scores of 20+ (and higher means on subscales of avoidance, intrusion, hyper arousal, total IES-R score). They also had more SARS concerns than non-HCW (e.g. thought they had SARS, concerned about infecting others)

Robertson et al (2004) [12]	Canada	SARS	Qualitative	n, 10 healthcare workers	Due to exposure to SARS, individual home quarantine, or having to continually wear a mask in the presence of others, or attending work but having to travel in their own vehicle/by taxi, while wearing a mask.	10 days (home quarantine)	In-depth interviews to examine the quarantine experience and its psychological effect, perceptions of contracting and spreading SARS, and the effect of SARS on participants' work.	Three main themes identified: loss, duty and conflict. Theme of loss included loss of intimacy, social contact, psychological and physical isolation; difficulties in explaining situation to children without raising fear; isolation from partners; experience of stigma due to risk of exposure and psychological experiences of stress, lack of sleep and somatic problems. The theme of duty focused around fear and anxiety of infecting others while acknowledging duty to continue their role. The theme of conflict included concerns around a lack of communication and clear guidance around quarantine, and anxiety around returning to work for those quarantined at home.
Shevlin et al. (2020) [36]	UK	COVID-19	Cross sectional survey	n, 2025 general population adults with quota sampling, stratified by age, sex, household income.	Lockdown, whole community home 'quarantine', social distancing	Data collected during quarantine, within the first week of 'lockdown'	Depression: PHQ-9; Anxiety: GAD-7; Trauma symptoms relating to the pandemic	Scored above cut offs: depression 22.1%; anxiety 21.6%; either anxiety or depression, 27.8%; traumatic stress 16.8%; COVID-19 anxiety rate was 21.3%. Higher levels of COVID-19 anxiety was associated with being in an older age group, those in the lower income band, compared with the highest income band, and having pre-existing health conditions. No effect of living alone. There was a decrease of depression/anxiety as age increased. Substantially higher odds of depression / anxiety in those with lower income. Lost income because of COVID-19, and pre-existing health condition associated with high odds of anxiety / depression. There were decreases in levels of traumatic stress as age increased; Substantially higher odds of traumatic stress in those in the middle income bands. Lost income because of COVID-19 associated with high odds of traumatic stress.
Singhal & Vijayaraghavan (2020) [35]	India	COVID-19	Cross-sectional online survey	n, 231 general population adults	Lockdown, whole community home 'quarantine', social distancing	Data collected during quarantine, within the first week of 'lockdown'	Study specific survey: Health anxiety: 6 items adapted from the short health anxiety questionnaire (Abramowitz 2006); Internal locus of control (LOC): 4 items; External LOC: 3 items; Coping strategies: 9 items	No differences in health anxiety, Internal or External LOC, coping mechanisms. Difference between age groups and their health anxiety (F (8, 222)=2.772. p<.05). Respondents who were in the age group 18-24 had higher health anxiety (M=3.55, SD=.690) when compared to 69 and above age group (M=2.71, SD=.681). Difference between age groups and their external locus of control (F (8, 222)=3.470. p<.01). Respondents who were in the age group 59-63 had higher External LOC (M=3.52, SD=.603) when compared to lower age group respondents; for 18-24 it was significantly lower (M=2.18, SD=.670). This shows that respondents in higher age group gave more control to external factors.
Sprang & Silman (2013) [24]	USA, Mexico, Canada	H1N1 and SARS	Mixed methods	n, 398 parents, 20.9% reported that they were ordered into isolation, 3.8% reported being quarantined	Isolation or quarantine (no more details of these given & unclear if parents who reported being quarantined or isolated were away from their children or not)	Unclear	Online survey, focus groups, interviews to investigate rates of post-traumatic stress disorder (PTSD) symptoms in children and their parents exposed to pandemic disasters across varying disease-containment experiences; Parent reported PTSD symptoms in child: PTSD-RI	33.4% said that their child/children began using mental health services, either during or after the pandemic, related to their experience. Most common diagnoses were acute stress disorder (16.7%), adjustment disorder (16.7%), and grief (16.7%). Only 6.2% of these children were diagnosed with PTSD. Children who experienced isolation or quarantine were more likely to meet the clinical cut-off score for PTSD (30%) than those who had not been in isolation or quarantine (1.1%). Mean scores on PTSD of the isolated and quarantined groups (22.3) 4 times higher than that of the general group (5.5). Qualitative data from interviews highlights the perceived threat, confusion, disruption, and isolation imposed by this type of health-related crisis.

Straus et al.(2004) [54]	Canada	SARS	Qualitative	n, 14 hospital physicians	Individual home quarantine for having contact with SARS patient	Unclear	Semi-structured interviews to explore issues of medical professionalism in the context of SARS	Quarantined participants described anxiety about the wellbeing of ill colleagues and their frustration at not being able to elicit details about their condition. Such knowledge about their colleagues may have alleviated some of their stress but this must be balanced with the need to preserve confidentiality.
Tarzi et al. (2001) [40]	UK	MRSA	Cross-sectional online survey	n,42 hospital patients, aged 65 years or older, of whom 22 were isolated for contracting MRSA	Hospital isolation whilst MRSA-positive	Data collected 2 weeks into the isolation period	Depression: GDS; Mood (anxiety and anger): POM	Isolated group reported higher level of depressive and anxious symptoms, compared with the MRSA-negative (non-isolated) group. No correlation was found between the length of the isolation period and the outcome measures.
Veer et al (2020) [55]	Europe	COVID-19	Cross-sectional online survey	n, 4997 general population sample	Various, depending on country	Data collected during quarantine, unclear how long after lockdown	Mental health: GHQ; Stressors measured using a list of daily hassles (58 items) and life events (27 items), and a list of 29 COVID-19 specific stressors	An effect of the crisis on participants' mental health was suggested by high average mental health scores compared with available representative samples from Europe. Participants with a past or present mental health condition had a higher average score (16.7±6.4) than those without (14.4±5.4). Positive appraisal style was associated with higher levels of resilience in the sample.
Wu et al (2008) [3]	China	SARS	Cross-sectional survey	n, 549 hospital employees, of whom 104 (19%) had been quarantined	Home/work quarantine due to being diagnosed with SARS, suspected of having SARS, or having had direct contact with SARS patients.	Unclear	Alcohol abuse/dependence symptoms (in past year): 7 items adapted from the NHSDA.	Being quarantine during the SARS outbreak was significantly associated with higher alcohol symptom counts, after controlling for demographic variables, having a relative/friend who contracted SARS, other traumatic experiences, and accounting for working in a high-risk location. Association remained after adjusting for PTS symptoms (post exposure to SARS), and depression.
Wu et al (2009) [4]	China	SARS	Cross-sectional survey	n, 549 hospital employees, of whom 104 (19%) had been quarantined	Home or work quarantine due to being diagnosed with SARS, suspected of having SARS, or having had direct contact with SARS patients.	Unclear	Post-traumatic stress (PTS) symptoms: IES-R.	Being quarantined was associated with high levels of PTS symptoms, after accounting for work exposure, and a relative or friend having SARS. When models additionally included SARS-related perceptions during the outbreak (i.e. perceived risk level & altruistic acceptance), being quarantined was no longer associated with PTS symptoms, suggesting that perceptions may partially mediate the effects of being quarantined on PTS symptom levels. Being quarantined did not predict persistence of PTS symptoms (i.e. a high level of PTS reported at the interview for the month prior).

YoungMinds (2020) [19]	UK	COVID-19	Mixed methods: web based survey with free text questions	n, 2,111 young people (age 13 to 25 years old) with past or current mental health needs	Community quarantine / lockdown	Opened the day schools closed to most children. Survey open for a week (until 25th March, 2 days after lockdown began)	Study specific survey to explore the impacts of COVID-19 on mental health, and their ability to access support	32% agree that it made their mental health much worse, 51% a bit worse, 9% no difference, 6% a bit better, 1% much better. Many reported increased anxiety, problems with sleep, panic attacks or more frequent urges to self-harm among those who already self-harmed. Other themes: concerns about family's health, the impact of school and university closures (and the loss of a safe and stable environment), loss of routine, loss of social connection, mental health support (26% reported they were no longer able to access mental health support), coping activities.
Zhu et al (2020) [9]	China	COVID-19	Cross-sectional online survey	n 2,279 members of the public, frontline medical personnel, non-frontline medical personnel, & community support workers, of whom 1,443 (63%) were quarantined	Hospital isolation for COVID-19 patients. Hotel quarantine for close contacts & front-line medical personnel. Home quarantine for all members of community	Unclear, but at least 10 days	General psychological difficulties: SRQ-20; Anxiety: GAD-7; Depression: PHQ-9	No significant differences for screening positive on SRQ-20, GAD-7 or PHQ-9 between participants with and without quarantine. Relatively high prevalence of mental health problems in the sample; these were unrelated with the control measure of quarantine, but were associated with the impacts on daily life. Multiple comparisons of the rate of screening positive for SRQ-20, GAD-7, and PHQ-9 between participant groups found no significant differences between frontline medical personnel who had been quarantined and any other group who were (i.e. close contacts in hotel quarantine, public residents in home quarantine) or were not quarantined.

## Abbreviations

BDI	Beck Depression Inventory	MOS-SF	Medical Outcome Study Short-Form
CES-D	Centre for Epidemiologic Studies - Depression Scale	NHSDA	National Household Survey on Drug Abuse
COPE-NVI	Coping Orientation to the Problems Experienced	PHQ	Patient Health Questionnaire
DASS	Depression Anxiety Stress Scales	POM	Profile of Mood States
GAD	Generalised Anxiety Disorder Scale	PROMIS	Patient-Reported Outcomes Measurement Information System
GDS	Geriatric Depression Scale	PSQI	Pittsburgh Sleep Quality Index
GHQ	General Health Questionnaire	PTSD-RI	University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index
HAD	Hamilton Depression Rating Scale	SAI	State Anxiety Inventory
HAM	Hamilton Anxiety Rating Scale	SAS	Self-Rating Anxiety Scale
IES-R	Impact of Events Scale Revised	SDQ	Strengths and Difficulties Questionnaire
ILS	Italian Loneliness Scale;	SDS	Self-Rating Depression Scale
INQ	Interpersonal Needs Questionnaire	SRQ	Self-Report Questionnaire
IRI	Interpersonal Reactivity Index	STAXI	State-Trait Anger Expression Inventory
MBI-GS	Maslach Burnout Inventory-General Survey	STQ	Subjective Time Questionnaire
MINI	Mini International Neuropsychiatric Interview		