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Aggressive measures, rising inequalities, and mass formation during the COVID-19 crisis: An overview and proposed way forward

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A series of aggressive restrictive measures were adopted around the world in 2020–2022 to attempt to prevent SARS-CoV-2 from spreading. However, it has become increasingly clear the most aggressive (lockdown) response strategies may involve negative side-effects such as a steep increase in poverty, hunger, and inequalities. Several economic, educational, and health repercussions have fallen disproportionately on children, students, young workers, and especially on groups with pre-existing inequalities such as low-income families, ethnic minorities, and women. This has led to a vicious cycle of rising inequalities and health issues. For example, educational and financial security decreased along with rising unemployment and loss of life purpose. Domestic violence surged due to dysfunctional families being forced to spend more time with each other. In the current narrative and scoping review, we describe macro-dynamics that are taking place because of aggressive public health policies and psychological tactics to influence public behavior, such as mass formation and crowd behavior. Coupled with the effect of inequalities, we describe how these factors can interact toward aggravating ripple effects. In light of evidence regarding the health, economic and social costs, that likely far outweigh potential benefits, the authors suggest that, first, where applicable, aggressive lockdown policies should be reversed and their re-adoption in the future should be avoided. If measures are needed, these should be non-disruptive. Second, it is important to assess dispassionately the damage done by aggressive measures and offer ways to alleviate the burden and long-term effects. Third, the structures in place that have led to counterproductive policies should be assessed and ways should be sought to optimize decision-making, such as counteracting

groupthink and increasing the level of reflexivity. Finally, a package of scalable positive psychology interventions is suggested to counteract the damage done and improve humanity's prospects.

KEYWORDS

COVID-19, government response, mass formation, emergency management (EM), rising inequalities

Introduction

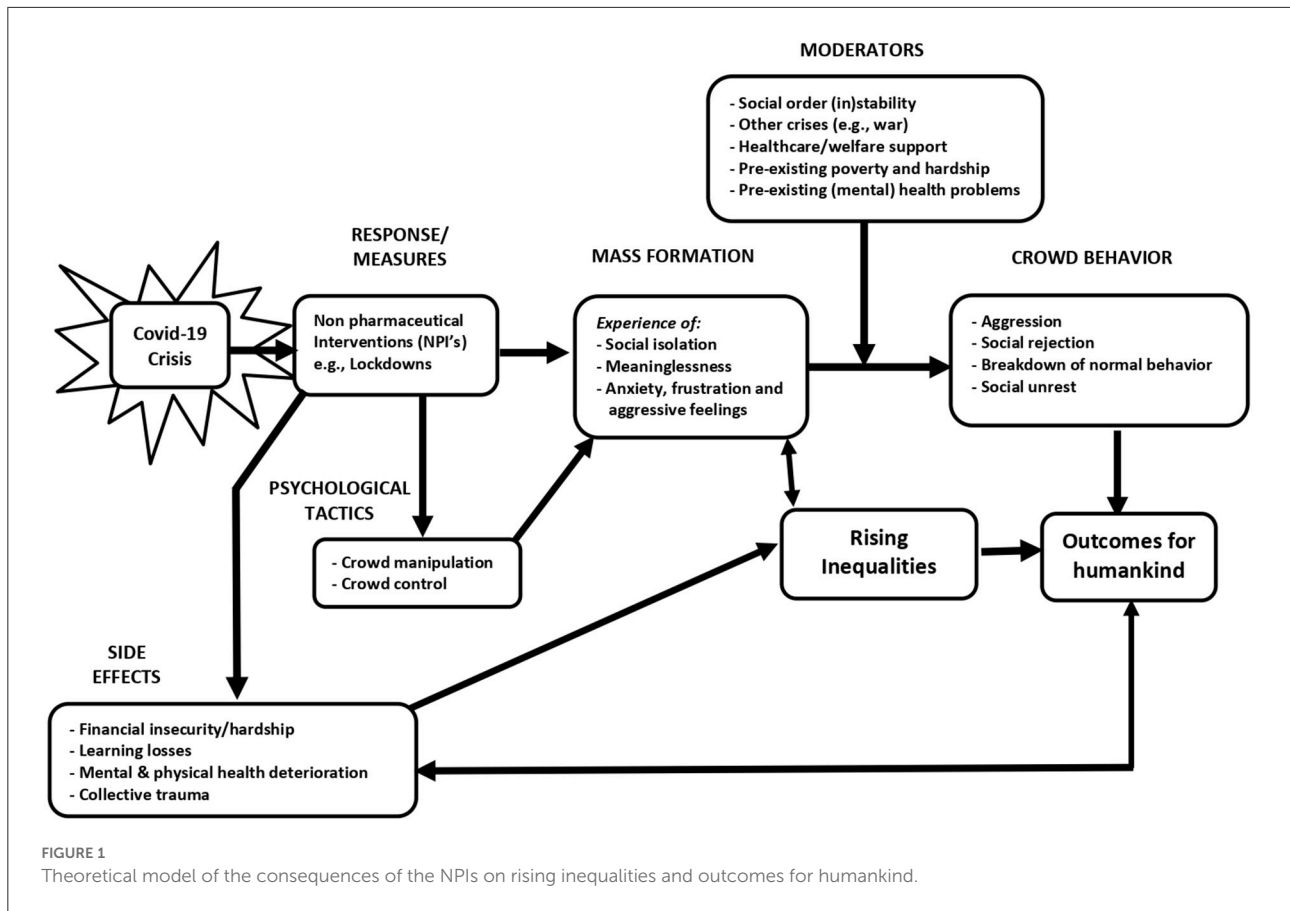
Historically, health crises have prompted governments and other authorities to act, with differing outcomes [cf. (1–3)]. Global and local health initiatives have long been in place [e.g., see (4)]. For the COVID-19 crisis, governments, and other authorities around the world (e.g., public health agencies, state and county leaders for their citizens, or businesses for their employees) adopted different ways of managing the pandemic. The response often included restrictive population-wide measures, summarized as non-pharmaceutical interventions (NPIs). Many countries opted for long-term strict and aggressive NPIs (5). However, there is little proof that most aggressive measures were more efficient than less disruptive, focused measures [e.g., (6–8)]. Some adopted measures may even have severe negative consequences [for reviews see e.g., (6, 9, 10)]. Furthermore, decision-makers have overly focused on one problem, COVID-19, instead of a more holistic approach (11–13). Together, this crisis management has led to rising inequalities and created new ones (14, 15).

Despite this, many countries opted for long-term strict and aggressive NPIs (5). A recent review and meta-analysis concluded that while lockdowns had little or no beneficial health effects, the economic and social costs were huge (16). Some scientists deem that lockdowns may be the “single biggest public health mistake in history” (17), worrying about long-term repercussions (10, 18). Measures such as closing businesses and disrupting global supply chains (19–21) have taken a toll on the world economy, and on physical and mental health (10, 22, 23). As early as November 2020, the World Bank estimated that the COVID-19 crisis would push 88–115 million people into extreme poverty (24), and a sharp increase in food insecurity worldwide led to hundreds of millions of additional people at risk of starving and food-insecurity (25–28). These macro-economic consequences can worsen mental health issues (29, 30) even cause fragmentation of society (31). Long-term negative economic and health consequences are exacerbated by increasing inequalities (32). Wealth distributions have become more skewed, worsening a pre-pandemic crisis. The top 10% of the global population owns 76% of the total wealth, while the bottom 50% share a mere 2% (33). In September 2021, 1% of the world's population held 45.8% of global wealth (34).

Prior research has shown that, both in the animal kingdom and within the human population, (extreme) levels of inequality often give rise to hierarchies and status dynamics that lead to negative health outcomes (35–39). The Whitehall studies investigating long-term social determinants of health found higher mortality rates in men and women of lower employment grades (40). Up to 20 years of difference in life expectancy has been observed between countries with a large status and economic differences vs. more well-off egalitarian countries (41). Some NPIs may have a large effect on increasing pre-existing inequalities and creating new ones, posing a threat to health and shortening longevity (15). Similarly, certain behavioral interventions along with NPIs used by governments to enforce compliance also worsened inequality. Concurrently, the COVID-19 crisis and the measures taken seem to have offered an opportunity to well-off people who profited from the transformation of life from physical to digital [e.g., (42)], and/or profited from the crisis (43). Many large companies profited, while many small companies crumbled, accelerating pre-existing trends (44).

The rising inequalities have consequences beyond mere financial insecurity, given the dynamism of extreme hierarchical differences (45). From a macro-dynamic perspective, aggressive health policies accompanied by psychological tactics to influence public behavior lead to mass formation and crowd behavior, and the breakdown of normal behavior [cf. (46, 47)]. The burden of financial and food insecurity and deterioration of mental and physical health fall disproportionately on already disadvantaged groups (48, 49), with predictable consequences for social capital and health (50–52). The general insecurity and trauma caused by the insecurity and uncontrollability of the events also contribute to mental health issues (46, 51, 53).

The current narrative and scoping review examines the consequences of aggressive NPIs on rising inequalities and adverse outcomes for humankind (see Figure 1). We describe how these NPIs impact mass formation and crowd behavior (Section Aggressive measures, mass formation and crowd behavior), *via* psychological tactics such as crowd manipulation and control (Section Psychological tactics). Section Centralized decision making and one narrative discusses the role of centralized decision making with one narrative and counter



movements. Section Collective trauma and conservation of resources addressed issues of collective trauma and offers perspectives from the conservation of resources theory. Section Rising inequalities offers an overview of the resulting increase in inequalities in multiple dimensions: socio-economic, gender, (mental and physical) health, and educational. Section Could we have done better? discusses whether we could have done better, and Section Discussion proposes ways forward. We end with a discussion and recommendations on ways to mitigate the negative effects resulting from aggressive measures.

Aggressive measures, mass formation, and crowd behavior

During the COVID-19 crisis, governments took the lead in managing the crisis for which they relied on NPIs. However, the 2007 and 2019 reports concluded that high-quality research on NPIs is lacking, and a list of NPIs was assessed in terms of effectiveness (54, 55). In the 2007 paper, it was commented that the scientific base of high quality studies

on NPIs is exceedingly small (54), and interventions that were explicitly not recommended were the general use of masks and other protective equipment and social distancing (54). Also, the experts surveyed for this research mentioned that forcibly limiting assembly or movement was legally and ethically problematic; they thought that mandatory long-term community restrictions and compulsory quarantine would lead to public opposition, and practical and logistical problems. It was concluded that voluntary measures and guidelines would be more acceptable and thus effective (54). The 2019 WHO report speaks of spreading cases over a longer period to reduce the height of the peak in “cases” but mentions NPIs such as community use of face masks, border closures, entry- and exit screening, and school closures as generally ineffective. Of the 18 NPIs mentioned in the report, measures such as ventilation and isolation of sick individuals were seen as effective (55). The quality of most studies in the report was rated as (very) low, making it hard to determine effective NPIs, and the possible harmful effects were not weighed. In 2020, a WHO report appeared with considerations on how to ease measures and this report also discussed the importance of human rights protection and the protection of

vulnerable populations (56). The extent to which governmental decision-making was flawed is still a matter of debate [e.g., (57)].

Several social psychological theories can explain what could have gone wrong in terms of these interactions. Group processes and crowd psychology predicts that especially in times of crisis people will be inclined to look at governments and authorities to guide their behavior [cf. (1, 3)]. As these authorities respond with guidelines for behavior and NPIs, this can lead to mass formation and crowd formation, similar to the way molecules behave or swarm, with ensuing collective behavior (47, 58, 59). Members of such groups often develop a high degree of emotional like-mindedness, and conventional inhibitions in such groups often decrease (60). In light of the crisis, experts were asked to advise governments, and these used behavioral interventions to steer public behavior in the desired direction and, simultaneously, the debate became highly polarized and politicized (61, 62). Indeed, the behavior of people changed quite radically in the early days of the crisis (63, 64), as psychologists advised governments on how to use psychological tactics to affect behavior change [e.g., (65, 66)]. A special journal issue described the many social group psychological aspects such as impact on societies, social connectedness, and new collective behaviors and inequalities (67). Within the social psychological field of crowd psychology, explanations are offered as to why the behavior of a crowd differs from that of the individuals within the crowd. These theories view the crowd as an entity, where individual responsibility is lost (68). In such a crowd, individuals tend to follow predominant ideas and emotions of the crowd, in a form of shared consciousness, or “collective mind.” Then it becomes relatively easy to violate personal and social norms and such crowds can become destructive (59). This theory may help explain deindividuation and aggression sometimes seen in large groups (69). In such groups, deindividuated people often show more sensitivity and conformance to situation-specific norms and support a social identity model of deindividuation (69).

In the early phase of a crisis, people are inclined to embrace a superordinate level of identity and look for (national) leaders for support and guidance (70). Strong responses toward group members who deviate from new norms are deemed legitimate by many (70, 71), although this may also be dependent on the status of the group member (72), and can change as the crisis progresses. Fluctuations or changes in group behaviors occur later on as people’s expectations of a return to normalcy are not met, or if they realize the downsides (70). Indeed, as discontent rises around the globe, citizens may engage in activism (73) and lawsuits against authorities for what they perceived as poor crisis management (74). In times of crisis, blame is often laid on minority groups, who are subsequently scapegoated and persecuted (3). This effect adds to minorities and the poorest already carrying the largest burden for the NPIs (10, 75, 76).

Psychological tactics

Crowd manipulation, propaganda, and crowd control

As people turn to leaders in times of crisis (77, 78), leaders have the responsibility to make important and consequential decisions (13). These leaders can choose to intervene in different ways. In general, and especially at the beginning of a crisis, people are inclined to ask for and accept strong leadership [cf. (79, 80)]. Leaders faced the choice between espousing voluntariness in policies or mandating rules and regulations to deal with the crisis (81–83). Although during a crisis leaders tend to enforce rules (84), some voluntariness may be key to trust in government (85). There is some evidence that voluntary measures are more supported than the enforced ones (85), and that voluntariness may offset the experienced disadvantages of policies (5, 83). In general, citizen engagement has many advantages (86). Moreover, it seems that many assumptions on which the NPIs are founded, seem to be biased at best (10, 13, 57). A review of over 100 studies about the COVID-19 crisis handling revealed that overall, the net effects of the policies were negative (87). Studies that suggest substantial benefits of lockdown, typically have flaws or limitations that seriously question the validity, e.g., their counterfactual is based on tenuous assumptions in forecasting models (88), they use interrupted time-series designs without a stable long-term period before and after intervention and without controlling for confounders (89, 90), and/or have no control non-intervention group (i.e., not a difference-in-difference approach) (89, 90), and other flaws (16). Furthermore, it was shown that lockdowns were very costly economically, but probably did not save lives (6, 91). Despite this, citizens generally believed many unfounded COVID-19 scientific claims leading to strong support of NPIs (92). Other options such as involving communities in responses to collective threats, may have avoided many if not all of the negative side effects (63), and voluntary measures may have been better in terms of ethics and human rights (5, 93).

Crowd manipulation, or the use of behavior change techniques based on crowd psychology, could have both intended and unintended consequences (47). While the theory of mass formation has been criticized for being too general (94), it is a meta-theory that seems to be supported by more micro- and middle-range theories on the social psychology of group dynamics and group behavior. These include theories such as group cohesion and intergroup conflict (47). For instance, large increases in perceived threat to a group were significantly related to diminished problem-solving effectiveness (95). A meta-analysis studying 335 effect sizes from 83 samples across 31 countries found that under conditions of strong population norms, norm-behavior associations were also stronger (i.e. people acting according to their norms), and the level of

collectivism strengthened these norm effects (96). Governments around the world have strongly communicated a high level of threat and called on norms of collectivism, obedience, and solidarity to excuse NPIs and accompanying harms (10). Overamplifying the harms of COVID-19 leads to citizens becoming more acceptant of the lifestyle changes (97). While these manipulations can in theory benefit the public, the required behaviors have had harmful consequences, especially for vulnerable groups (10, 13, 16, 98). Note that one does not need to invoke some nefarious totalitarianism (99). There can be extreme bonding among people to defeat a real or imagined enemy, in this case, a virus (70). A meta-analysis showed that there is a tendency of ingroup bonding (closing the ranks) combined with a tendency to focus on the outgroup as the source of the threat (100). Even when external threats are not related to a specific outgroup, hostility, prejudice, and discrimination are aimed at outgroups, and detrimental intergroup outcomes occur (1). Dehumanization or the “act of denying outgroup members human-like attributes” [(1), p. 110] may be a mediating factor between a perceived threat and negative behaviors and attitudes toward that group (101). This is strengthened by the moralization of the COVID-19 response which led citizens to believe it is better to impose restrictions than to take no action (102). For the COVID-19 crisis, the superimposed economic crisis contributes to higher levels of hostility and discrimination (and dehumanization) of outgroups to which the cause of the crisis is attributed (1, 103–105). Interestingly, this prejudice against outgroups was not apparent when a system-level explanation for a crisis, i.e. the economic system, was made salient (103). Also, the status of the outgroup moderates this effect: the prejudice is lower when the status of the outgroup is higher (100).

Mass formation concerning reacting to an external threat combined with the resulting extreme inequality can potentially be very harmful [cf. (103, 105)]. Citizen behavior may be unfortunately steered in a direction of societal damage. Mass formation can make people adopt ideas that are incompatible with their previous beliefs. For instance, many people with supposedly progressive ideologies supported harsh measures against unvaccinated people, such as requiring unvaccinated individuals to always remain confined to their homes. Some thought governments should even imprison individuals who publicly questioned vaccine risk-benefit. Moreover, they also thought that unvaccinated individuals should have a tracking device, or be locked up in designated facilities or locations until they are vaccinated (106). These beliefs have nothing to do with improving the uptake of effective vaccines (a most welcome outcome) but delve into other priorities where aggression is the main theme. This kind of dehumanization of a large group could create a whole new kind of inequality: a privileged group of people religiously following governmental response vs. a scapegoated group questioning official policies.

The divide between those groups may have many consequences, from not being willing to work with a co-worker who fails to conform to condoning the violation of basic human rights for such a group with exclusion from society (61). A bias seems to work in the direction of the government responses: a study using a representative sample from 10,270 respondents from 21 countries showed that vaccinated people have a high antipathy against unvaccinated people, 2.5 times more than a more traditional target such as immigrants from the Middle East (61). Interestingly, the antipathy is larger in countries with higher social trust and fewer COVID-19 deaths. In the study, no bias from the unvaccinated toward the vaccinated was detected (61). Why would agreeable and average people hold such beliefs? The answer may be that redirecting the blame toward a scapegoat may help people restore a sense of control, easing feelings of uncertainty (107). For instance, participants “were especially likely to attribute influence over life events to an enemy when the broader social system appeared disordered” [(107); Study 3]. The consequences of crowd behaviors like dehumanization and scapegoating may be quite severe, and it would be advised to work toward reducing intergroup tensions instead of fueling them (1). However, many government responses may have increased these effects rather than reduced them. For political reasons, sometimes governments chose to attribute the blame to some “enemy” while presenting themselves as the savior (3, 108). For the general public, in addition to a social and economic divide, these NPIs and such framing of the message can lead to feelings of social isolation, loss of meaning in life, anxiety, and aggressive feelings (47).

Experience of social isolation, meaninglessness, anxiety, frustration, and aggressive feelings

The COVID-19 crisis, as with any crisis, spurs feelings of anxiety, frustration, and aggression (109). Social safety theory would predict that social threat greatly impacts human health and behavior (109). Social isolation has led to the experience of meaninglessness, although the role of mindsets about the COVID-19 situation has been important (110). Three mindsets that people formed early in the pandemic, namely considering the pandemic as a catastrophe, as manageable, or as an opportunity, had a self-fulfilling impact on emotions, health behaviors, and well-being (110). In general, the heightened level of mortality salience has been related to heightened frustration and aggression in society [cf. (109)] and especially aggression toward those with opposing world views (111). Human aggression refers to intentional harmful behaviors directed at other individuals, and violence is aggression that has extreme harm as a goal. Hostile aggression is seen as

a form of aggression that is rather impulsive or unplanned, while instrumental aggression is premeditated and a proactive form of aggression that is used as a means to an end [for a review see (112)]. Aggressive thoughts and feelings are probably even more common, as many situations and interactions with others can give rise to frustration and aggression. While pre-existing biological and learned tendencies may play a role, the current situation gives rise to a spike in aggressiveness, both verbal (e.g., people blaming certain groups for the current situation and thinking aloud about what should happen to such groups) and actual aggression. There is some evidence that interpersonal aggression and violence increased with aggressive NPIs, especially in places with lockdowns and stay-at-home orders (113, 114). As the crisis continued for much longer than initially expected, aggression and frustration could accumulate, without people having many chances to vent, e.g., by going to the gym.

Excitation transfer theory can explain why anger may be extended over longer periods, and this often happens when two or more arousing events are close in terms of time (115). When people are in a survival mode for prolonged periods, they become more fearful, distrustful, irritable, and aggressive (116). Although a survival mode can be an adaptive response to an immediate threat of existential danger, in the long-run over-exposure to stress-response hormones harms mental health and relationships and leads to intergenerational trauma (116, 117). Displaced aggression directed at another person or target, which is not the source of the arousing frustration, can also occur. A meta-analysis showed that the magnitude of the displaced aggression was bigger in a negative setting (e.g., the current crisis). Also, if the provocateur and target were more similar to each other e.g., in terms of gender, race, and/or values, displaced aggression was higher (118).

A study among 2,799 Chinese college students (119) showed that the relationship between fear of COVID-19 and relational online aggressive behavior is mediated by moral disengagement (i.e., the process by which people convince themselves that ethical standards do not apply to them in a certain context, by reframing their behavior as morally acceptable). High mortality salience can also increase aggression, often directed at others who threaten one's worldview (120). Note that terror management can also lead to a more positive way of coping, such as reflecting on the meaning of life (111), and this may be a more effective way of dealing with a crisis (46). However, a study among 1,374 participants in seven Arab countries showed that traumatic stress coupled with collective identity trauma increased death anxiety. This was in turn related to reduced well-being, post-traumatic stress syndrome, anxiety, and depression (45). The authors speak of a vicious cycle of inequalities increasing infection and death from COVID-19 and the COVID-19 crisis increasing inequalities further (45). As many of the behaviors aimed at reducing the spread of the virus, such as hand-washing or masking, can be seen as group rituals

(i.e., acts that people regularly repeat together in the same way), symbolizing important group values (e.g., health and safety) people deviating from such rituals provoke anger and moral outrage (10, 121). Individuals more worried about contracting the disease made harsher moral judgments than less worried individuals, even after controlling for political orientation (122). Also, people that were high on health anxiety before the crisis may be more vulnerable to excessive anxiety about COVID-19 (123), and would need therapeutic interventions (124).

There is also evidence that the COVID-19 crisis has increased psychological distress that could be related to proximal and distal defenses against death-related thoughts (45). The crisis has increased anxiety and fear for personal and loved one's physical well-being (125). Conversely, physical activity could act as a buffer (126) but anxiety-buffering outlets such as social networks and sports were inaccessible for many, leaving people vulnerable to experiencing even higher levels of death anxiety (45, 111). A "perfect storm" ensued, whereby stress and anxiety increased and pathways for releasing stress were cut off for many.

Furthermore, all of the social determinants of health were affected; none of these was equally distributed even before the crisis started, but the crisis has accelerated this uneven distribution (127, 128). According to Broadbent and Streicher (129), many of these effects were foreseeable, especially the effects of lockdowns on the Global Poor. During the COVID-19 crisis, commitments to reducing health inequalities were lost from view, or not very salient for wealthy countries, foreseeable health costs were large on deprivation of livelihood, disruption of health services for other conditions, and disruption of education and foreseeable health benefits were minimal (reduction of social contact to the extent modeled was impossible due to overcrowding and non-compliance necessary to sustain a livelihood, the much younger average age while severe COVID affects mostly older people) (129). Much of these effects have been a result of the government's response to the crisis and the choices made in this respect (128). In many countries, decisions were made unilaterally and an official narrative was supported and defended (130).

Centralized decision making and one narrative

Decision making during a health crisis is difficult as many issues need to be considered concurrently while data may be lacking or massive but still flawed (13, 131). Collective decision-making and intelligence are key to effective decision-making (132). However, sometimes it is falsely assumed that centralized decision making is the only method that may work. Another potential bias may be that a small group of experts is listened to, at the expense of experts that advocate a different route (133). An official narrative approach was followed (130, 134)

with counter narratives routinely labeled as misinformation (135). Sometimes the experts in control acquire so much power that they take over even the role of the opposition and dissenters are ostracized (136–138). Authorities have used media and public communication to impose their narrative (134). People and groups challenging the narrative often face dire consequences, from social exclusion to arrest and molestation at demonstrations, in both authoritarian and democratic countries (134). Concurrently, the question has been raised if coercive measures are desirable policy responses, as these have been seen as ineffective and counterproductive in the past (139), leading to distrust in institutions, alienation, and avoidance of care (139–141). The combination of coercive measures and a cancel culture to preserve an official narrative may backfire (139, 142). Public persuasive communication may lead to the opposite effect or behavior than intended (143, 144).

Historically, mixing political ideology with science, when the state regulates science, has led to disastrous outcomes. For instance, a Soviet geneticist favored by Stalin, dominated biology and agricultural science, rejecting Mendelian genetics. The careers and lives of geneticists who opposed him were destroyed, and many were arrested or killed (145, 146). When the Chinese Communists adopted the same approach, starvation killed 30 million people (145). Favoring one ideology at the expense of other views can lead to unwanted outcomes (10, 11, 13, 147), for example, using free speech to shut down free speech (148, 149). The resulting “cancel culture” may frighten other academics who will then be careful in speaking out and/or publishing on certain topics (147). Extremely centralized decision making has other disadvantages, including diminishing democracy, diminished freedoms, and threats to human rights (150–154). Trust in government may diminish, and support for the NPIs may waver (85). While COVID-19 was a major problem, tackling it should never be done to the exclusion of all other problems we face as humanity (57). Decision making should serve most humans, and science can aid here, but it should not be pretended that “science” is perfect and error-free [cf. (155)]. Concurrently, journalism and science should avoid propaganda (154).

Countermovements

Grassroots movements and countermovements have gained more research attention lately (156–161). As the distribution of power has been unequal throughout history and is typically held by an elite minority, enabling people to use collective power is an important aim of those movements (162). Self-serving (or apparently self-serving) actions of the elite may cause a sharp decrease in trust in institutions for some people, while others keep being trustful. With the COVID-19 crisis, trust in governments and scientific institutions oscillated but mostly decreased (163). People may join countermovements because they give meaning and the opportunity to reinstate

dearly held values and beliefs (164). Many citizen activists feel they contribute to a better world in this way; especially the younger generation may be driven more by moral issues rather than political ones (165). However, such groups often face stigmatization and criminalization, undermining of group identity, and institutionalized social subordination (165, 166).

The effectiveness of countermovements

In terms of mass formation, possible countermovements have received far less scientific attention (167, 168). Many people may realize that the direction society is moving in does not match with core values, such as humanness (e.g., consideration, empathy), critical thinking, and freedom [cf. (169, 170)]. Indeed, during the COVID-19 crisis, there has been a global wave of social justice movements that draw attention to the negative effects of a multi-dimensional crisis (134). While most of these movements have a strictly non-violent character, the tactics used by these movements range from civil disobedience and (strict) nonviolence to anti-authoritarian strategies and self-defense, and even guerrilla warfare (164). Whether or not these movements are effective and what methods are most effective remains a matter of debate (160). While the authors of this article do not approve of any violence, some writers even argue that violence against a state that has a violence monopoly is sometimes justified and necessary (171). However, recent historical research shows that non-violent approaches are much more effective than violent ones (172). Regardless, the righteousness of such movements can be debated (173). Several authors have claimed that these movements in current times are misinformed and hence see the rise of these movements as dangerous (174). However, simply claiming that those movements are misinformed and labeling all information, not in line with official guidelines as “conspiracy theories” [e.g., (175)] may be too naïve. Some countermovements may be strongly motivated to be well informed. Effectiveness may depend on whether such groups can create space for new social relations, spread awareness, show resilience, have elite support/permission such as that they are shielded from police and military suppression, and are able to improve people’s lives (164, 176). A causal relationship between pressure on authorities and change in policies is difficult to determine, but possible (157).

Historical research from 1900 to 2006 comparing the effectiveness of 323 violent vs. non-violent resistance campaigns showed that non-violent civil resistance was more effective in producing change (177). Violent campaigns were successful in 26% of the cases, whereas non-violent campaigns were successful in 50%. In the last 10 years of the research, this effectiveness was reduced to only 6% for violent campaigns vs. 34% for non-violent ones (178–180). Countries in which there were non-violent campaigns were 10 times more likely to transition to democracies within 5 years after those campaigns, than countries

with violent campaigns. Interestingly, this was independent of whether the campaign succeeded or failed (178). Effectiveness was bigger under conditions of large, diverse, and sustained participation when the movement was able to elicit loyalty shifts among power elites (e.g., army, police, media, business elites), with campaigns entailing more than protests, with variation in methods used, and when campaigns did not descend into chaos or opt for violent methods despite repression (178). Preparation seems crucial for successful campaigns, for instance in South Africa the anti-apartheid movement organized a boycott of white businesses after preparing for months to become self-sufficient first (181).

The recent decline in the effectiveness of non-violent movements might reflect the smaller size of such campaigns, reliance on more symbolic displays of resistance and mass non-cooperation (such as street demonstrations rather than strikes) that do not weaken the opponent's sources of power, and less disciplined non-violent actions (182). Sometimes even one person can make a difference (183, 184). Della Porta (185) argues that three kinds of ruptures can be brought about by countermovements, often successively: cracking, or sudden ruptures; vibrating, contingently reproducing those ruptures; and sedimenting, stabilization of consequences of the rupture. If these historical lessons apply, perhaps effective countermovements could help in turning around the decisions of implementing non-effective and harmful NPIs, thereby buffering negative long-term effects.

Collective trauma and conservation of resources

Aggressive measures adversely impact physical and mental health (10, 13, 186). We will focus here on the result of collective trauma or the “psychological reactions to a traumatic event that affects an entire society” [(187), p. 1]. This trauma can affect the collective memory of an entire group and often invokes sense making (188, 189). COVID-19 collective trauma may be large (190). Four mental models seem to be associated with the current collective trauma, namely uncertainty, danger, grotesque, and misery, as well as four primary emotions, namely grief, disgust, anger, and fear (190). Although people have a propensity to hide negative emotions and trauma, the expression of emotions can yield both individual and collective benefits; sharing may alleviate emotional distress and aid in garnering social support (191).

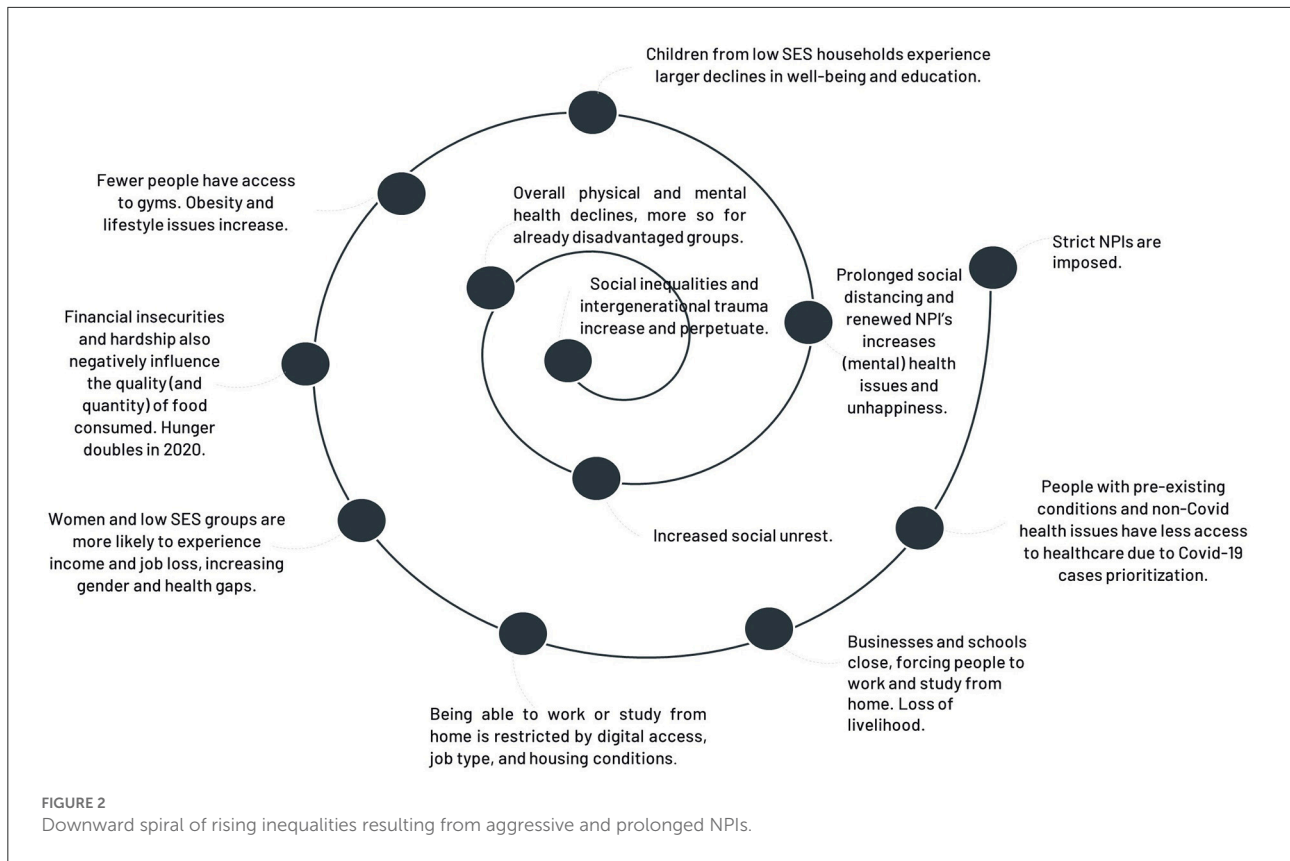
A strong indication of collective hardship is the steep increase in mortality rates among adults under the age of 45, who are largely spared from COVID-19 deaths. Some additional deaths were caused by self-destructive behavior such as substance abuse, homicides, and traffic accidents (98).

Conservation of Resources theory (COR) can serve as an integrative theoretical lens for understanding how people gain

and conserve resources (192–194). People differ in the extent to which they are good at gaining tangible resources (e.g., money and property) and intangible resources (e.g., strategic relationships to gain power) (195). According to COR, both individuals and groups, and even societies as a whole strive to obtain and maintain valuable resources (194). There may be an evolutionary need to acquire and conserve resources for survival (194). COR has been used to explain stress outcomes in various contexts, including organizational settings, following traumatic stress and for everyday stressors (192, 196).

Hobfoll speaks of “resource caravan passage ways,” meaning that the ecological conditions often determine the extent to which people can create and sustain resources (194). E.g., women were already on a resource loss before the crisis, but the crisis has exacerbated it, and a resource loss spiral can jeopardize progress toward gender equality (197). For instance, as women work predominantly in service sectors, the shutdown of many such sectors has disproportionately affected them, leading to the largest gender-unemployment gap ever recorded [(198), see also (197)]. This, combined with the increased number of stressors at home, to do more household chores and care tasks, leads to increased stress, less leisure time, and increased burn-out (197). People became more socially conservative during the crisis regarding gender role conformity and gender stereotypes, while political ideology remained constant (199). Stress occurs when resources are lost. In Western contexts, 74 common and important resources are described, including sense of pride, goal accomplishment, hope, personal health, food, help with household chores and childcare, and stable employment (192, 196). The concurrent loss of so many resources during the COVID-19 crisis has been unprecedented [cf. (46), see Figure 2 for a downward spiral in resources].

This can be traumatic for many people, especially given the unpredictability of the duration and intensity of the situation (200). Fear has been identified as a strong predictor of posttraumatic stress disorder, often accompanied by negative thoughts about the self, others, and the world (200). This is compounded by a worldwide sense of insecurity, and loss of personal and social security (201), leading to psychological symptoms of grief (200). Also, job loss has been associated with symptoms of grief and loss of meaning in life (202). Staying-at-home orders are associated with loss of freedom and autonomy as well as loneliness (203), especially when measures were perceived as coercive (204). This may also lead to a fear of coercive policies being enforced over a longer or perhaps indefinite time (139). Fear- and anxiety-related disorders have spiked since 2020 (22). Overall, both tangible and intangible resources were lost during the crisis, thwarting physical and mental health [cf. (200, 205)]. People experiencing extreme resource loss (e.g., losing their income, going through a divorce, losing access to proper health care and ways to cope) may fall prey to the *desperation principle*. This understudied tenet of COR predicts that when people's resources are overstretched or



exhausted, they may enter a defensive self-preservation mode in which they behave increasingly aggressive and seemingly irrational (194, 206). They may defensively try to conserve the remaining resources (192). When people are subject to an increased number of stressful events, depression symptoms also increase (207), and major depression is a leading cause of suicide (208). An impact on suicide rates may take years to document. Current research indicates that suicide rates may indeed have increased (186), sometimes after an initial decline in suicides (209). People with more resources before the pandemic may be better suited for resource gain (200) ushering in psychological well-being, health, and functioning (210).

Groups that had fewer resources from the start included minority groups, youngsters, females, and individuals with a mental health history, and economic insecurity (211, 212). Harms induced by NPIs may also be exacerbated by pre-existing or induced lack of stability of the social order in a country or region and in case of pre-existing mental health issues (10, 213). During the crisis, those with pre-existing mental and physical health conditions reported the highest level of emotional distress, although mental health deterioration was population-wide (213). Also, poverty increase in already vulnerable regions made things worse. Additional, extreme events, such as riots and wars may add an extra layer of multiplicative harm (214).

People in comparable circumstances may differ in how resilient they are in dealing with those circumstances (215), and some may experience post-traumatic growth (216). Research by Yi-Feng Chen et al. (217) stresses the role of proactive personality and organizational support in coping with disruptions during COVID-19.

Rising inequalities

Social inequalities occur when resources within society are distributed unequally, e.g., income, goods, access to information, etc. (218). In the last decades, economic inequality increased in most countries, stabilizing in the 1990s (219), but increasing dramatically since 2020, prompting some authors to refer to this as the “second pandemic” (220). While the focus on making profits has created wealth for large groups of people, resources have become unevenly divided among the total population. There is evidence that economic inequality increased (15). Although this trend was already visible before the crisis started [for a review see (219)], this seems to have accelerated after the start of the crisis (221). While in the last 25 years, 1.1 billion people were lifted from poverty through economic growth (222), during the COVID-19 crisis global extreme poverty rose sharply and in October 2021 it was estimated that 100

million additional people were living in poverty (223). Very early on in the pandemic, warnings were expressed that the negative effects may outweigh possible positive ones (10–12, 57) and ways to optimize decision-making (13) and alternative ways forward were offered (6, 224). Note that other authors disagree and argue that the NPIs are proportional and have substantial benefits [e.g., (225, 226)]. There has indeed been substantial debate on whether lockdowns offer some benefits in reducing at least COVID-19 deaths and many studies have tried to answer this question. In general, these studies have limitations given that no randomized trial has assessed this question and modeling, or observational studies leave substantial uncertainties and are subject to selective reporting and interpretation (227). A meta-analysis has found very small benefits of lockdowns on COVID-19 mortality rates (16), and cost-benefit analyses find that the costs of lockdowns (including what we outline above) far outweigh any potential benefit that may occur (6, 228). Debate and disagreement will likely continue, given that assessments on the relative benefits of lockdown are based largely of weak observational data under very complex circumstances.

Inequalities have several consequences for health, well-being and happiness, and longevity (218, 229). Countries that let inequality increase have lower happiness rates than countries with higher equality (230, 231). Population well-being, consisting of physical, emotional, and social health, explains variation in life expectancy. Communities with high well-being are characterized by engaging in healthy behaviors, strong social connections and support systems (229), and happy people who live longer (232), even though the causal mechanisms can be debated. Several meta-analyses have shown a favorable association between psychological well-being and survival (233), and well-being partially mediates the associations of race, poverty, and education with life expectancy (229). Importantly, life satisfaction and optimism about the future, access to housing, healthcare, and perceptions of safety, were also significantly associated with life expectancy (229). Poor housing conditions were related to greater stress and reduced well-being during the COVID-19 crisis (234). As psychological well-being is affected both directly and indirectly *via* the pandemic and the NPIs (i.e., losing one's job and housing, getting a divorce because of the aforementioned, or because of being quarantined for months), this may lead to more inequalities in terms of income, but also well-being [cf. (46, 235)]. General health and well-being during the crisis have been lowered [for a review see (236)], especially so for vulnerable groups and disadvantaged countries (237, 238). Below we first discuss the various inequalities affected by the pandemic and the adopted NPIs. We should caution that it is often difficult to disentangle how much of these effects were due to the pandemic vs. the measures taken. Occasionally the interaction of the pandemic with the measures taken may have had multiplicative negative effects. Then, we discuss options that may help in breaking this

trend. In Table 1, we give a non-exhaustive overview of literature and findings regarding inequalities during the COVID-19 crisis.

Vulnerable populations

Many authorities responding to the pandemic often stated they aimed to protect the vulnerable. However, several adopted measures seem to have especially hurt this group instead of helping. Several measures disrupted and contracted the social networks of older adults during the crisis. Pre-pandemic racial/ethnic network disparities were exacerbated, with negative consequences for the physical and mental health outcomes of these groups (211). As networks are important not only in daily life, but especially in times of crisis, social distancing led to a limited ability to weather the crisis, especially for vulnerable populations (211). Many countries have chosen to put vulnerable elderly people in complete isolation. This forced social and physical isolation is a serious stressor (313). Resilience may have been further compromised (314, 315), creating paradoxical effects (10). Both regular and routine health care for non-COVID-19 disease was disrupted, posing a threat to health outcomes for many diseases (243, 292). The long-term consequences of the relative neglect of the public health care system, and that people were hesitant to visit their physician for the non-COVID-19 problems (279, 316–319), remain unfathomed. E.g., it was estimated originally that about 28.5 million operations worldwide were postponed during the initial 12-week peak of the crisis (320). Once more, vulnerable populations were hit hardest, increasing pre-existing inequalities (321).

Economic inequality: The rich got richer and the poor poorer

Economic inequality has hugely increased exacerbating pre-existing inequalities and this seems a self-reinforcing process as lockdown measures continue or keep being imposed (15, 49, 322–324). Hundreds of millions of people were driven into poverty, while others, individuals and corporations, gained (325). This has led to the paradoxical situation that in some countries people were more worried about starvation than becoming ill from COVID-19 (49). Almost 4 billion people, half of the world population, live on <6.70 dollars a day. A review across four continents showed that restrictive NPIs are especially hard on the poor as they unevenly impact the livelihood and socio-economic activities of those groups (326). A World Bank report concluded: “Taken together, COVID-19 has directly offset the reduction in the [poverty] gap between countries observed from 2013 to 2017” (324). Income loss was steepest for the poorest 20% of the world, resulting in the

TABLE 1 Non-exhaustive overview of the effects on inequality resulting from the non-pharmaceutical interventions enforced in response to the SARS-CoV-2 pandemic.

Effect on inequalities	References
Socio-economic status (SES) and ethnic groups	
Estimates that the side effects of attempting to fully mitigate the COVID-19 pandemic will negatively impact life expectancy. Over 10 years, the negative life expectancy from socio-economic inequalities alone will be around the equivalent of six unmitigated COVID-19 pandemics. This is not considering the negative effects on life expectancy due to increased mental health problems, suicides, and drug abuse	(239)
The effect of the COVID-19 pandemic and lockdowns differed across SES groups, e.g., groups or counties with lower SES had higher infection incidence and mortality	(32, 42, 240, 241)
Racial minorities (Black, Indigenous, and Hispanic) were more at risk of getting infected and had worse COVID-19 health outcomes during the pandemic. Existing inequalities were exacerbated	(42, 128, 242–248)
Children with low SES experienced worse health outcomes during the pandemic due to increased exposure to adverse health determinants (e.g., tobacco, unsuitable food, changes in physical activity, spending more time in front of the screen, less social contact, and more noise)	(242, 245, 249–255)
People living in areas with higher levels of pre-existing inequalities experienced more adverse effects during the pandemic	(32, 240, 241, 244, 246, 255–259)
Healthy behaviors (e.g., physical activity, healthy eating) were lower, especially for low SES families	(241, 260)
Geographical economic effects of the crisis. Uneven economic effects uncorrelated to the epidemiological pattern. Lower educational levels related to higher mortality for working-aged women and people between 65 and 79 years old during the crisis. The rise in social inequality because of the burden of the disease and the measures have fallen disproportionately on already disadvantaged groups challenges solidarity and social justice	(32, 240, 246, 255–259, 261, 262)
The pre-existing inequalities of refugee teenagers compounded due to the response to the pandemic, with worse (mental) health outcomes, due to severe economic and service disruptions, as well as low social connectedness	(263)
Ethnic minorities had a lower COVID-19 vaccine uptake, higher mortality rates and larger decreases in life expectancy	(248, 264)
Food insecurities arise for low SES groups due to the rise in poverty, unemployment and food prices. In addition to the economic barriers, people living in rural areas also experienced insecurities due to decreased psychological access to food	(265–268)
Food insecurities lead to an increase in unhealthy eating behaviors (e.g., consuming high caloric products)	(260)
Digital inequalities led to disparate possibilities during the pandemic such as access to COVID-19 vaccinations, the ability to work or study from home and to maintain social connections with friends and family	(258, 269–273)
Gender inequalities	
Women experienced higher rates of mental health issues and psychological deterioration than men	(260, 274–277)
Women experienced a higher increase in suicide rates than men	(278, 279)
Women also more often experienced job loss and/or loss of income than men	(247, 276, 277, 280–283)
Gender gaps and unequal distribution of household chores increased during the pandemic. Women reported increased household chores and childcare and decreased leisure time. The propensity to work from home did not differ across genders. In Spain, by May 2020, women from middle-income households with kids experienced 3% larger income loss than men	(274, 277, 280, 283, 284)
Reinforcement of existing gender inequality in academic work. Women were underrepresented as (senior) authors of academic papers during the pandemic, deepening pre-existing inequality. While the quantity of women authored publications seemed to have been on par, quality seemed lower	(285–287)
Women were more exposed to the COVID-19 virus than men due to representing most frontline workers. In Spain, the cumulative incidence rate was higher for women than men	(244, 251, 288)
Males experienced higher COVID-19 mortality rates than females	(242, 244)
The COVID-19 pandemic caused serious setbacks in advancements in solving problems such as child marriages, gender-based violence, and female genital mutilation. Estimates show that 6 months of lockdown led to an additional two million more cases of female genital mutilation, 31 million cases of gender-based violence, and 13 million more child marriages over the next 10 years that wouldn't have occurred otherwise	(289)
Age group inequalities	
The risks of mortality from COVID-19 for people aged 60 and above are significantly higher than for younger people. This led to a life expectancy decrease in 27 out of 29 countries included in the study	(245, 251, 290):
Children subjected to school closure and other lockdown measures reported adverse mental health symptoms	(291)

(Continued)

TABLE 1 (Continued)

Effect on inequalities	References
Health inequalities	
Patients with non-COVID 19 conditions had less access to treatment and preventive measures during the crisis Taken together with other trends, such as privatization of healthcare, already marginalized sections of society were hit harder, leading to worsening existing and creating new health inequalities	(244, 292)
Physical activity health inequality was increased due to differences in access and availability to engage in physical activities during lockdowns	(293)
The switch to remote consultations especially impacted older people, unemployed, people with low SESs, migrants, and men, as these groups were less likely to use remote consultation	(250)
People with pre-existing health conditions (e.g., obesity or malnutrition) had worse COVID-19 outcomes. Oftentimes these people also experienced social inequalities and nutritional disparities long before the crisis	(262, 294–296)
Mental health inequalities	
The crisis increased existing mental health conditions and exacerbated preexisting inequalities in that respect. Financial insecurity mediated some of the effect of SES and mental health outcomes. People with a (family) history of mental health disorder also experienced greater difficulties adjusting after lockdown release. SES inequalities in social network, loneliness and mental health increased. A study in Japan showed positive effect on subjective well-being for socially advantaged people vs. negative effects for socially disadvantaged people, widening the gap	(241, 260, 262, 296–302)
Economic inequalities	
Income inequality was mainly created by the policy response to the crisis rather than its health consequences. By early June 2020, the pandemic has generated at least 68 million additional poverty years in 150 countries, mainly among already disadvantaged groups. Additionally, the health consequences worsen income inequality	(303)
Working from home increased inequalities in the labor market based on SES, digital access, job type, sector, and hierarchical position. Male, older, highly educated, and highly paid employees benefited from working from home	(42, 244, 257, 260, 273, 283, 304, 305)
Aggressive NPIs increased income inequality and poverty, with vulnerable groups impacted more. In Spain, by May 2020, households in the richest quintile lost about 7% of their income, while the poorest quintile lost 27% of their income	(247, 262, 306–308)
The pandemic did not affect between-country inequality, which continued to decrease as in the previous years	(309)
Educational inequalities	
Educational inequalities emerged or increased in terms of parental income, education, internet access, English and technology skills, and/or previous school performance. Search for online learning resources was substantially larger for areas with higher income, better internet access and fewer rural schools in the US. In Germany, daily learning time was halved, from 7.4 h. This decrease was significantly larger for low achievers, who displaced learning time with TV or computer games. In the Netherlands, where access to internet is better than other countries, with a relatively short school closures of 12 weeks, education learning loss sharply increased for students from disadvantaged households	(269–271, 310–312)

largest impact of the COVID-19 crisis on the world's poorest, increasing the global poverty rate from 7.8 to 9.1 percent by the end of 2021 (327). The effects on inequality and social mobility are expected to be long-term: people who lost income due to the pandemic have been about twice as likely to spend down on assets or savings. Hence, they will be less able to cope with continued or reoccurring income loss. Also, 57% of the people who lost income due to the pandemic have been more likely to go a full day without eating, and the aggregate loss of between 0.3 and 0.9 years of schooling also impacted the poorer families and their economic prospects. Government interventions such as unemployment insurance and benefits for furloughed workers in the short term at least, partially mitigate the effect of the loss of livelihood (14). In Spain, it has been estimated that without those interventions, inequality

would have increased by almost 30% in just 1 month (14, 223). However, young people and foreign-born workers profit less from those interventions and experience a large loss of purpose in life (46, 328, 329).

Educational inequalities

Early in the pandemic, school closures were widespread. In March 2020 schools closed in 138 countries, affecting 80% of students worldwide (214). This is despite a heated scientific debate regarding the effectiveness of school closures on virus transmission. Without a clear answer on the effectiveness of school closures, students' education suffered and the "hurt can last a lifetime" [(330); for a review see (10, 214)]. As early as

April 2020 it was stated that school closures would affect poorer children most, as closures also exacerbated food insecurity and the non-school factors (e.g., parental availability for help and supervision, internet access and technology availability, quiet spaces, etc.) that are the primary source of inequalities in educational outcomes (214). Even though many schools switched to online education, this did not help much as a substitute. A study in the Netherlands among 350,000 students showed that students made little or no progress during the school closure and learning loss was “most pronounced among students from disadvantaged homes” [(331), p. 1]. This was despite that the Netherlands was seen as a best-case scenario, with a relatively short lockdown, equitable school funding, and one of the best rates in terms of broad-band access. While for children from high-income families learning might be possible at least theoretically, children from lower income families are faced with numerous hurdles. Besides this, as many parents lost their jobs, these children may be exposed to this stress as well. As “previous recessions have exacerbated levels of child poverty with long-lasting consequences for children’s health, well-being, and learning outcomes.” [(214), p. 243], the long-lasting consequences should not be underestimated (332). Recent studies showed a sharp increase in inequalities regarding education (269, 331) and student well-being (333). In addition, homeschooling caused high levels of parental stress (334). Taken together, educational inequalities increased sharply, and student, as well as parent well-being was at stake during and after the school closures.

Gender inequalities

While the year 2020 was earmarked for reflection on gender inequalities, it has been the year that saw an increase in both existing and new gender inequalities (278). The rising gender inequalities are in the domains of health and well-being, home, domestic violence, work and poverty, and leadership (278). Women reported greater stress and anxiety during lockdowns (335), especially women with children (336), and female students (333). The health and well-being of women were also disproportionately affected, lowering life expectancy, and increasing suicide rates (337). Moreover, reports of abuse, self-harm, and thoughts of suicide/self-harm were higher among women (338). Women were more likely to experience (physical) aggressive interactions in their dream content (339). Also, women’s physical and reproductive health was jeopardized, as many countries reallocated medical care toward COVID-19 patients (340). Gender-based violence increased at an alarming rate [for a review see (341)]. Anxiety and depression tripled for pregnant and postpartum women (342). Mothers were more likely to take on more household chores during the crisis and they were responsible for homeschooling (343), and worked on average 5% less, while men worked on average the same number

of hours (344). Women with young children reduced their work hours four to five times more than fathers (344).

In academia, pre-existing inequalities persisted, and new ones arose. While academic gender inequalities were already discussed for quite some time [e.g., (345)], the crisis increased pre-existing gender inequalities (346). For instance, in terms of academic output, while men working mainly from home became more productive in the first 10 weeks of the lockdown, and overall research productivity in the US increased by 35%, female productivity dropped by 13%. This productivity gap was found in six more countries (347). While women already faced inequity in terms of having a higher teaching load and more service tasks, which are rewarded less than academic publishing, this was exacerbated when teaching and mentoring had to be done online (347). This is compounded by women having to take on most household tasks, homeschooling, childcare and sometimes caring for aging parents and extended family (343, 348). Also, it was predicted that women’s poverty rate would rise by 10% globally as a result of the NPIs, as many service jobs were affected (349). Taken together, women experienced more mental health problems, domestic violence, and a larger burden of household and professional tasks.

Results of inequalities: Increase in stress

The result of rising inequalities may be an increase in stress and resulting in mental health problems (350). A meta-analysis indeed showed that income inequality was negatively related to mental health (351). In general, humans cause stress on people lower in the hierarchy, and in the last few decades, a lot of research investigated the causes and consequences of this [for a review see (352, 353)]. For instance, Sapolsky researched the question of why primates (including humans) cause each other so much stress. Apes and other primates have more stress-related diseases than any other species, and this seems to be because having spare time in these species is used to cause stress to others, usually lower in the hierarchy (36). Stress levels for low-status baboons were significantly reduced when baboons high in the hierarchy were inadvertently killed due to eating tainted meat (37). The extent to which these studies have validity for human society is debatable. For obvious ethical reasons, it is very difficult to do a study in which extreme hierarchical differences are created and subsequently lifted to study the effects. However, the Whitehall studies, stretching over decades show that status differences and inequalities are related to ill health and mortality, even when controlling for lifestyle (38), and these differences in health outcomes and mortality even stretched until after retirement (352). Interestingly, this was the case even though mental health for low status workers, working in stressful jobs with little autonomy, increased after retirement (354). It goes without question that it is imperative to minimize inequalities.

Reducing inequalities

Good governance, or the actions governments and organizations take to govern society through laws, norms, power or language, is key to reducing inequalities in society (355). Reducing gender inequalities in academia is also important and several policies are promising (356). An Oxfam report suggested responding to the crisis with several measures to increase equality (357). In general, community development seems to be a promising avenue in this respect (358). Coordination and integration of the health sector and community development may help streamline efforts to influence health and well-being of especially vulnerable groups (358). Evidence-based policy making may help reduce inequalities (359) and to buffer the negative effects of the crisis. Going forward, citizens and governments should act to create a more equal and sustainable world (325). Below, we describe what governments could have done better and what can be learned from this crisis. This examination should not be construed as an effort to blame anyone—a blame culture would be a perpetuation of the crisis and the toxic environment that we described above that fosters inequalities. Conversely, it is important to learn from our mistakes to correct them and not repeat them, close the circle of the pandemic, and be prepared for future pandemics without disrupting life (360).

Could we have done better?

We could have done better in our response to COVID-19. Vast power was given to experts who had (or claimed) expertise on COVID-19. This resulted in an exclusive focus on illness and deaths from COVID-19, with implemented and mandated NPIs of unprecedented severity, and which had been recommended against in previous pandemic plans (54, 55, 141, 361). These NPIs were also implemented without adequate consideration of their collateral effects (as discussed above and predicted in previous pandemic plans). The response bypassed the lessons learned from past pandemics and other emergencies.

Emergency management (EM) is the prevention and mitigation of, preparedness for, response to, and recovery from emergencies, regardless of the risk/hazard (362). An EM Agency (EMA) is a coordinating agency that coordinates requests from the Subject Matter Agency (the agency dealing with the direct effects of the hazard, here, public health for the COVID-19 hazard), while also dealing with the indirect effects of the hazard (here, pandemic and response) (363). The EMA coordinates the four simultaneous EM critical functions (Table 3) during a public emergency, like COVID-19, with direct and indirect effects of the virus and any response to the virus on all of society.

The EM process is the same for any public emergency, including a pandemic. By following the process, the EMA, unlike the public health medical experts, is specifically trained to optimize the response. The seven EM process steps that must

occur in any public emergency, and how these should have been taken for this pandemic, are shown in Table 2 (6, 363). By not following the established EM process, the wrong aim, governance, mission analysis, and courses open were more likely to be selected without any published pandemic plan (363). Many negative consequences and exacerbations of inequality discussed above were predictable and should have been considered in risk-benefit analyses (6, 11, 54, 55, 141, 361). Others concluded that crucial parts of the EM process were missed during the pandemic response, although these authors did not recognize that these were components of the EM process and that they were, so to speak, reinventing the wheel (11, 13, 365). In Table 3 we mention some priorities we believe the EM process would have discovered to enable a response with far less collateral damage, and some current priorities necessary for recovery.

Discussion

Possible ways forward

Governments and public health authorities worldwide have imposed their decisions, while having trouble using evidence-based policy and decision making (13, 359, 366). This has harmed many groups in society (10, 367). Many scientists also went along with the narrative that the most aggressive NPIs were necessary for the greater good, for instance, experts advising on how to modify behavior [e.g., (366, 368)]. Others have pointed out that the debate has been highly polarized and should ideally be more open-minded and nuanced (369). Society has fallen prey to groupthink (11) with the perpetuation of dysfunctional entrenched patterns in responding to the pandemic (13). It seems more important than ever to uphold and renew important values that societies fare by, to enhance the well-being of their citizens (370). Healing society should focus on people's dignity, rights, values, and humanity (370). Concurrently, it becomes imperative to use evidence-based policy and decision making (359, 371) and reflexivity (13), as used in the EM process (363).

It is key to restore the health and well-being of the wider population, and create a positive environment in which people can thrive (46). Well-being should matter to governments (230). Next to reversing the most aggressive and ineffective policies (360, 372), the way people cope with the situation is important (10, 373). Most people seem to be negatively affected in terms of health and well-being, and personality differences may also play a role (217). People that score high on proactive personality are better at spotting opportunities and acting upon them (374). They also are better able to foresee consequences and risks inherent in actions that they take and anticipate them, affecting environmental change (375). For many people access to intangible resources such as social support, and social belonging and access to tangible resources such as income, livelihood, and access to (healthy) food have been thwarted. Loss spirals accelerate once resource losses accumulate, while resource gain

TABLE 2 The emergency management process: seven steps and how they should have been applied during the SARS-CoV-2 pandemic.

Steps in the EM process	Specifics of this step during the SARS-CoV-2 pandemic
1. Identification of the hazard	The hazard is SARS-CoV-2
2. Selection and maintenance of the aim	The aim is to minimize the impact of SARS-CoV-2 and our response on the society of the jurisdiction The aim was not necessarily “to flatten the curve” or “to protect the medical system,” which may be included in objectives
3. Establish a Governance Task Force, to provide leadership for all policy, programs, and actions taken, with many diverse stakeholders involved, and led by the most senior government official (e.g., the provincial premier in the provinces of Canada)	Governance Task Force was not assembled, and public health officers and medical advisors had undue influence
4. Risk/Hazard assessment	The risk from SARS-CoV-2 was very early on known to be extremely age-dependent (especially in older adults with comorbidities), and the potential impacts on critical infrastructure (including healthcare) predictable
5. Mission analysis to determine the <i>objectives</i> of what needs to be done	For SARS-CoV-2 this includes tasks given (pre-written pandemic response plans) and tasks implied required to meet the aim. This included maintaining confidence in government (by diminishing fear, ensuring mutual aid, and ensuring constant communications), protecting seniors, and protecting critical infrastructure and essential services (e.g., new medical surge capacity, full continued education, continuity of business and economy)
6. Defining courses open/options to determine <i>how</i> the mission analysis objectives can be met	This entails determining courses open for each grouping of tasks, as determined by assigned teams with appropriate diverse expertise (to prevent groupthink). Each course open has a full assessment of cost-benefit to justify options, and plan for solutions to expected collateral damage
7. Public issuing of a written comprehensive evidence-based Response Plan	Issuing a written Pandemic Response Plan forms the basis of confidence in government by transparently demonstrably justified due diligence

References: Joffe and Redman (6), Redman (363), and Redman (364).

cycles become weaker (194). It is easy to widen the inequality gaps, but these may take years and years to close. For instance, while it was estimated before the crisis that closing the gender gap could take up to 99.5 years, after the crisis it was estimated to take 135 years (376, 377).

Collective healing and restoring meaning

The current situation requires collective healing [(378); cf. (379)]. While programs such as Eye Movement Desensitization and Reprocessing [EMDR; (380)], brainspotting (381) and neurosculpting (382) may be effective for relieving (complex) trauma [for reviews see (383, 384)], more scalable positive psychology solutions are needed (230). Many people will feel the need to reinstate a sense of meaning in life (46). Scalable solutions may entail for instance life crafting (reflecting and setting goals and undertaking actions for important areas of life) to find meaning in life, as a written guided online intervention (385), or *via* a chatbot [e.g., (386, 387)]. Gratitude and grit may restore a sense of meaning in life and have been related to decreased suicidal ideations (388). Gratitude and well-being are correlated (389), and the connection between these seems to entail social connectedness and meaning in

life (390). Communities could investigate possibilities to help many people *via* scalable solutions (10, 13, 46). For instance, life crafting and other positive psychology and mental health interventions delivered online or *via* a chatbot, could be a scalable solution and “first aid” for people experiencing issues such as anxiety, depression, and loss of purpose in life (46, 386). Goalsetting also seems promising in terms of reducing the gender and ethnic minority achievement gap for specific student populations (391). Interventions should be rigorously tested for effectiveness and they should preferably be done in concert with other positive psychology interventions tackling educational inequalities [see (392)]. Moreover, it is advisable to radically increase the voluntariness of measures. Giving people a choice instead of forcing policies upon them, might increase intervention effectiveness. For instance, when people work from home voluntarily, they experience fewer adverse effects of teleworking [e.g., (393)].

Increasing diverse citizen engagement in (global) problems (86), and grassroots movements may help counter authoritarian tendencies associated with the pandemic response, salvage democracy (151, 394–396), and increase democratization of companies post-COVID-19 (397). It may be better to strengthen people’s sense of responsibility to take action after carefully laying out the pros and cons of behavior (398). Finally, we should

TABLE 3 Examples of emergency management function priorities in addressing the SARS-CoV-2 pandemic.

EM function	Priorities at the start of the pandemic	Priorities mid-2022 for endemic SARS-CoV-2
Preparation	<p>Define the mission: to ensure minimum impact of SARS-CoV-2 on society as a whole</p> <p>Establish a Governance Task Force as the single decision-making body for policy, programs, and actions, with broad diverse representation, led by the Premier, and coordinated and supported by the Emergency Management Agency</p> <p>Release a comprehensive written Pandemic Response Plan</p>	<p>Define the mission: to ensure minimum impact of endemic SARS-CoV-2 on society as a whole, <i>and</i> to recover from the lockdown-based response collateral damage</p> <p>Establish the appropriate Governance Task Force and disband other advisory groups</p> <p>Release a comprehensive written Pandemic Response and Recovery Plan</p>
Mitigation	<p>Focused protection of the most vulnerable: a plan for long-term care homes and for those in the community aged ≥ 60 years with multiple comorbidities</p> <p>Plans for socially vulnerable groups: e.g., temporary housing support to reduce household crowding</p>	<p>Voluntary focused protection: understand that the risk for those aged <60 years is similar to that from seasonal influenza</p>
Response	<p>Ensure critical infrastructure is ready for people who get sick, including new surge capacity in hospitals so that continuity of the medical system is ensured</p> <p>Ensure equitable access to healthcare</p>	<p>Removal of fear of SARS-CoV-2 and of each other: ensure understanding of risk in relation to other daily risks, by age group and comorbidity</p> <p>Removal of fear of future use of NPIs: ensure understanding of accumulated evidence about trade-offs and efficacy to end talk of future mandated lockdowns, quarantine of exposed people, school closures, community masking, and border closures</p> <p>Establish capabilities for endemic SARS-CoV-2: new healthcare surge capacity without plans to sacrifice healthcare for all other conditions</p>
Recovery	<p>Reduce fear with daily information presented with context including plans for surge capacity, give hospitalizations and death numbers with denominators, by age group, in comparison to other risks causing deaths annually, and without a focus on raw case counts</p> <p>Give evidence on the cost-benefit balance of NPIs and lockdowns: explain the difficult trade-offs involved and the justification for focused protection</p>	<p>Develop a detailed plan to overcome the impacts from the use of fear and NPIs/lockdowns on mental health, societal health, our children's education and development, missed/delayed diagnosis and treatment of medical conditions, government debt, confidence in the economy, etc</p> <p>Replace fear with confidence by using the EM process, with cost-benefit analysis of all recovery options open, improved communication, and a written plan that is transparently demonstrably justified by due diligence</p>

References: Joffe and Redman (6), Redman (363), and Redman (364).

acknowledge that for many of the proposed interventions, we would benefit from having stronger evidence from large (cluster) randomized trials, to understand whether they may work in different populations and circumstances. While the pandemic led to thousands of randomized trials of drugs, biologics, and vaccines (399, 400), few trials were performed on NPIs (401) and the research agenda on psychological and social-level interventions was even thinner. This deficiency should be remedied.

Conclusion

As the COVID-19 crisis and NPIs of unprecedented severity and duration are related to many negative side effects and increase inequalities worldwide (402), stress, health, and trauma for vulnerable populations must be addressed (403). The economic fall-out and rise in inequalities may be long-term (403). Governments should take well-being as a spearhead for decision-making in the upcoming years (230). Hopefully, with effective interventions, the tide may be turned.

Author contributions

MS played the primary role in the conception of the manuscript, writing, reviewing, and revising the manuscript. JJ contributed to writing the manuscript, identifying studies on inequalities, and editing the manuscript. AJ wrote section on “Could we have done better”, crafted Tables 2, 3, contributed to writing, and editing the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

Watch here Mass formation and rising inequalities, a proposed way forward - Michaëla Schippers - YouTube the interview MS gave about this article for the podcast "Follow the Science".

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