Aggressive Measures, Rising Inequalities and Mass Formation During the COVID-19 Crisis: An Overview and Proposed Way Forward

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MS played the primary role in the conception of the manuscript, and wrote, reviewed, and revised the manuscript. JI contributed to writing the manuscript, identifying studies on inequalities, and editing the manuscript. AJ wrote the paragraph on "Could we have done better" and crafted Table 2. AJ also contributed to writing and editing the manuscript.

Keywords

COVID-19, Government response, Mass formation, Emergency management (EM), Rising inequalities

Abstract

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A series of aggressive restrictive measures around the world were adopted in 2020-2022 to attempt to prevent SARS-CoV-2 from spreading. However, it has become increasingly clear that an important negative side-effect of the most aggressive (lockdown) response strategies may involve a steep increase in poverty, hunger, and inequalities. Several economic, educational and health repercussions have not only fallen disproportionately on children, students, and young workers, but also and especially so on low-income families, ethnic minorities, and women, exacerbating existing inequalities. For several groups with pre-existing inequalities (gender, socio-economic and racial), the inequality gaps widened. Educational and financial security decreased, while domestic violence surged. Dysfunctional families were forced to spend more time with each other, and there has been growing unemployment and loss of purpose in life. This has led to a vicious cycle of rising inequalities and health issues. In the current narrative and scoping review, we describe macro-dynamics that are taking place as a result 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 towards 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 future prospects for humanity.

Contribution to the field

The Covid-19 crisis and government response in the form of non-pharmaceutical interventions (NPIs) has been related to a spike in poverty, hunger and inequalities across the globe. The resulting ripple effects may define our world for years to come, also in terms of long-term (mental) health effects. This paper aims to explore the effects on rising inequalities and the outcomes for humankind. We present a model of the drivers, outcomes, mediators and moderators, such as psychological tactics, mass formation and crowd behavior. Drawing from interdisciplinary research, we describe resulting behaviors using a macro- meso- as well as micro lens. This comprehensive model may not only be insightful for practical purposes, but may also spur research in this area. We offer suggestions for counteracting the negative effects with emergency management as well as positive psychology interventions that may help turn the tide. The goal of this paper is to draw attention to the negative effects of the aggressive NPI's in terms of inequalities. Also, we describe a downward spiral with respect to inequalities worldwide. Our suggestions to minimize and/or counteract the damage resulting from NPI's can be tested and may have both a practical as well as theoretical implications.

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Abstract

A series of aggressive restrictive measures around the world were adopted in 2020-2022 to attempt to prevent SARS-CoV-2 from spreading. However, it has become increasingly clear that an important negative side-effect of the most aggressive (lockdown) response strategies may involve a steep increase in poverty, hunger, and inequalities. Several economic, educational and health repercussions have not only fallen disproportionately on children, students, and young workers, but also and especially so on low-income families, ethnic minorities, and women, exacerbating existing inequalities. For several groups with pre-existing inequalities (gender, socio-economic and racial), the inequality gaps widened. Educational and financial security decreased, while domestic violence surged. Dysfunctional families were forced to spend more time with each other, and there has been growing unemployment and loss of purpose in life. This has led to a vicious cycle of rising inequalities and health issues. In the current narrative and scoping review, we describe macro-dynamics that are taking place as a result 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 towards 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 future prospects for humanity.

1 Introduction

Historically, health crises have prompted governments and other authorities to act, with differing outcomes (cf. Adler et al., 2022; Biesma et al., 2009; Jedwab et al., 2021). Global and local health initiatives have long been in place (e.g., see WHO, 2018). For the COVID-19 crisis, governments, and other authorities (e.g., public health agencies, state and county leaders for their citizens, or businesses for their employees) adopted different ways of dealing with the crisis around the world. Response often included restrictive population-wide measures, summarily called here non-pharmaceutical interventions (NPIs). However, here is little proof that most aggressive measures work much better than less disruptive, focused measures (e.g., Fögen, 2022; Guerra & Guerra, 2021; Joffe & Redman, 2021) for reducing COVID-19 burden. Some adopted measures may even have severe negative consequences (for reviews see e.g., Joffe & Redman, 2021; Panneer et al., 2022; Schippers, 2020). Furthermore, decision-makers have overly focused on one problem, COVID-19 instead of a more holistic approach (Joffe, 2021; Melnick & Ioannidis, 2020; Schippers & Rus, 2021). Together, this crisis management has led to rising inequalities and created new ones (Aspachs et al., 2021; Binns & Low, 2021).Some scientists have even concluded that lockdowns may be the "single biggest public health mistake in history" (Bhattacharya, 2021; Marmalejo, 2022), worrying for long-term repercussions (Hevia & Neumeyer, 2020; Schippers, 2020).

Despite this, many countries opted for long-term strict and aggressive NPIs (Kraaijeveld, 2021). A recent review and meta-analysis concluded that while lockdowns had little or no beneficial health effects, the economic and social costs were huge (Herby et al., 2022). Measures such as closing restaurants and businesses and disrupting global supply chains (Chowdhury et al., 2021; Guan et al., 2020; Singh et al., 2021) have taken a toll on the world economy, and on physical and mental health (Santomauro et al., 2021; Schippers, 2020; Taquet et al., 2021). As early as November 2020, the World Bank estimated that the COVID-19 crisis would push 88-115 million people into extreme poverty (Yonzan et al., 2020), and a sharp increase in food insecurity worldwide led to hundreds of millions of additional people at risk of starving and even more people becoming food-insecure (Paslakis et al., 2020; Zetzsche, 2020; Oxfam, 2021; Nelson et al., 2021). These macro-economic consequences can lead to a steep increase in mental health issues (Jones, 2017; Nanath et al., 2022) and even fragmentation of society (Storm, 2021). Aggressive health policies may have long-term negative economic and health consequences especially if they are related to increasing inequalities (Wachtler et al., 2020). 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% (Civilsdaily, 2021). In September 2021, just over one percent of the world's population held 45.8% of global wealth (Deshmukh, 2021).

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 (Calhoun, 1973; Sapolsky, 2005; Sapolsky & RI, 2004; Smith et al., 1990; Snyder-Mackler et al., 2020). The Whitehall studies investigating long-term social determinants of health, found higher mortality rates from men and women of lower employment grade (Chen & Miller, 2013). Up to twenty years of difference in life expectancy has been observed between countries with large status and economic differences versus more well-off egalitarian countries (Marmot & Wilkinson, 2005). Some NPIs may have a large effect on increasing pre-existing inequalities and creating new ones, posing a threat to health and increasing mortality and shortening longevity (Binns & Low, 2021). 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., Bajos et al. 2021), and/or profited financially from the crisis (Plott et al., 2020). Many large companies profited, while many small companies crumbled, accelerating pre-existing trends (Baines & Hager, 2021).

Taken together, the rising inequalities are related to consequences beyond mere financial insecurity, given the dynamism of extreme hierarchical differences (Kira et al., 2021). From a macro-dynamic perspective, aggressive health policies accompanied with psychological tactics to influence public behaviour, have consequences such as mass formation and crowd behavior, and breakdown of normal behavior (cf. de Jong et al., 2020; Desmet, 2022). The burden of harmful side effects, such as financial and food insecurity for billions of people, accompanied with a deterioration of mental and physical health falls disproportionally on already disadvantaged groups (Cheng et al., 2021; Krauss et al., 2022), with predictable consequences for social capital and health (Corman et al., 2012; Dickerson et al., 2022; Polsky & Gilmour, 2020). The general insecurity and trauma caused by the insecurity and uncontrollability of the events also contribute to mental health issues (de Jong et al., 2020; Dickerson et al., 2022; Vermote et al., 2022).

In the current narrative and scoping review, we first aim to elucidate mechanisms that explain the potential harmful effects of aggressive NPIs (See Figure 1). We describe how these NPIs impact mass formation and crowd behavior, via psychological tactics such as crowd manipulation and control. We describe how these affect inequalities and in turn outcomes for humankind. We then review the literature and describe the effects of NPIs and mandates on different groups in society and the resulting increase in inequalities. We offer a non-exhaustive overview of the effects on inequalities resulting from the pandemic and NPIs. These include socio-economic, gender, (mental and physical) health, and educational inequalities, as well as the rising inequalities for many ethnic groups. We end with a discussion and recommendations on ways to mitigate the negative effects resulting from aggressive measures.

Figure 1. Theoretical model of the consequences of the NPI's on rising inequalities and outcomes for humankind

2 Aggressive Measures, Mass Formation and Crowd Behavior

During the COVID-19 crisis, governments took the lead in managing the crisis. They relied on NPIs to manage the crisis. However, in 2007 and in 2019 reports concluded that high-quality research on NPIs is lacking, and a list of NPIs was assessed in terms of effectiveness (Aledort et al., 2007; WHO, 2019). In the 2007 paper, it was commented that the scientific base of high quality studies on NPIs is exceedingly small (Aledort et al., 2007), and interventions that were explicitly *not* recommended were the general use of masks and other protective equipment and social distancing (Aledort et al., 2007). 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, practical and logistical problems. It was concluded that voluntary measures and guidelines would be more acceptable and thus effective (Aledort et al., 2007). The 2019 WHO report speaks of spreading cases over a longer period of time in order 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 (WHO, 2019). The quality of the 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 protection of vulnerable populations (WHO, 2020). The extent to which governmental decision-making was flawed is still a matter of debate (e.g., Ioannidis, 2020).

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. Adler et al., 2022; Jedwab et al., 2021). 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 swarms, with ensuing collective behavior (Desmet, 2022; Edmonds, 2006; Le Bon, 2002). Members of such groups often develop a high degree of emotional like-mindedness, and conventional inhibitions in such groups often decrease (Kok et al., 2016). 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 at the same time the debate became highly polarized and politicized (Bor et al., 2022; Bylund & Packard, 2021). Indeed, the behavior of people changed quite radically in the early days of the crisis (Drury et al., 2021; Prentice et al., 2022), as psychologists advised governments on how to use psychological tactics to affect behavior change (e.g., Bavel et al., 2020a; Rayamajhee & Paniagua, 2022). A special journal issue described the many social group psychological aspects such as impact on societies, social connectedness and new collective behaviors and inequalities (Krings et al., 2021). 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 (Le Bon, 2018). 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 (Le Bon, 2002). This theory may help explain deindividuation and aggression sometimes seen in large groups (Postmes & Spears, 1998). In such groups, deindividuated people often show more sensitivity and conformance to situation-specific norms and support a social identity model of deindividuation (Postmes & Spears, 1998).

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 (Abrams, Lalot, et al., 2021). Strong responses towards group members who deviate from new norms are deemed legitimate by many (Abrams, Lalot, et al., 2021; Abrams, Travaglino, et al., 2021), although this may also be dependent on the status of the group

member (Wiggins et al., 1965), 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 (Abrams, Lalot, et al., 2021). Indeed, as discontent rises around the globe, citizens may engage in activism (Grant & Smith, 2021) and lawsuits against authorities for what they perceived as poor crisis management (Sharp, 2010). In times of crisis, , blame is often laid on minority groups, who are subsequently scapegoated and persecuted (Jedwab et al., 2021). This effect adds to minorities and poorest already carry the largest burden for the NPIs (Chirisa et al., 2022; Schippers, 2020; Spring et al., 2022).

3 Psychological tactics

3.1 Crowd manipulation, propaganda, crowd control

As people turn to leaders in times of crisis (Mayseless & Popper, 2007; Volkan, 2014), leaders have an important responsibility to make important and consequential decisions (Schippers & Rus, 2021). 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. Antonakis, 2021; Binagwaho, 2020). Leaders faced the choice between espousing voluntariness in policies or mandating rules and regulations to deal with the crisis (Gupta et al., 2020; Schmelz & Bowles, 2022; Yan et al., 2021). Although during crisis, leaders have a tendency to enforce rules (Teichman & Underhill, 2021), some voluntariness may be key to trust in government (Schmelz, 2021). There is some evidence that support for the measures will be greater under voluntary than under enforced implementation (Schmelz, 2021), and that voluntariness may offset the experienced disadvantages of policies (Kraaijeveld, 2021; Yan et al., 2021). In general, citizen engagement has many advantages (Carpini et al., 2004). Moreover, it seems that many assumptions on which the NPIs are founded, seem to be biased at best (Ioannidis, 2020; Schippers, 2020; Schippers & Rus, 2021). A review of over 100 studies about the COVID-19 crisis handling revealed that overall, the net effects of the policies were negative (Allen, 2022). 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 (Flaxman et al, 2020), they use interrupted time-series designs without a stable long-term period before and after intervention and without controlling for confounders (Siqueira et al, 2020; Umer and Khan, 2020), and/or have no control non-intervention group (i.e., not a difference-in-difference approach) (Siqueira et al, 2020, Umer and Khan, 2020), and other flaws (Herby et al, 2022). Furthermore, it was shown

that lockdowns were very costly economically, but probably did not save lives (Gibson, 2022; Joffe & Redman, 2021). Despite this, citizens generally believed many unfounded Covid-19 scientific claims leading to a strong support of NPIs (Graso et al., 2022) Other options such as involving communities in responses to collective threats, may have avoided many if not all of the negative side effects (Drury et al., 2021), and voluntary measures may have been better in terms of ethics and human rights (Kraaijeveld, 2021; Silverman et al., 2020).

Crowd manipulation, or the use of behavior change techniques based on crowd psychology, could have both intended and unintended consequences (Desmet, 2022). While the theory of mass formation has been criticized for being too general (McPhail, 2017), 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 (Desmet, 2022). For instance, large increases in perceived threat to a group were significantly related to diminished problem-solving effectiveness (Rempel & Fisher, 1997). 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 (Fischer & Karl, 2022). 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 (Schippers, 2020). Overamplifying the harms from COVID-19 leads to citizens becoming more acceptant of the lifestyle changes (Graso, 2022) While these manipulations can in theory benefit the public, the required behaviors have had harmful consequences, ever more so for already vulnerable groups (Herby et al., 2022; Schippers, 2020; Schippers & Rus, 2021; Mulligan & Arnott, 2022). Note that one does not need to invoke some nefarious totalitarianism (Arendt, 1973). There can be extreme bonding among people in order to defeat a real or imagined enemy, in this case a virus (Abrams, Lalot, et al., 2021). 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 (Riek et al., 2006). Even when external threats are not related to a specific outgroup, hostility, prejudice and discrimination are aimed at outgroups, and detrimental intergroup outcomes occur (Adler et al., 2022). Dehumanization, or the "act of denying outgroup members human-like attributes" (Adler et al., 2022, p. 110) may be a mediating factor between a perceived threat and negative behaviors and attitudes toward that group (Haslam & Stratemeyer, 2016). 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 (Graso et al., 2021). For 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 (Adler et al., 2022; Becker et al., 2011; Fritsche et al., 2011; Krosch et al., 2017). Interestingly, this prejudice against outgroups was not apparent when a system-level explanation for a crisis, i.e. the economic system, was made salient (Becker et al., 2011). Also, the status of the outgroup moderates this effect: the prejudice is lower when the status of the outgroup is higher (Riek et al., 2006).

Mass formation with respect to reacting to an external threat combined with the resulting extreme inequality, can potentially be very harmful (cf. Becker et al., 2011; Krosch et al., 2017). Citizen behavior may be unfortunately steered into 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 (Shannon, 2022). 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 versus 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 (Bor et al., 2022). 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 high antipathy against unvaccinated people, 2.5 times more than a more traditional target such as immigrants from the Middle East (Bor et al., 2022). Interestingly, the antipathy is larger in countries with higher social trust and fewer COVID-19 deaths. In the study, no bias from the unvaccinated towards the vaccinated was detected (Bor et al., 2022). Why would otherwise agreeable and average people hold such beliefs? The answer may be that redirecting the blame towards a scapegoat may help people restore a sense of control, easing feelings of uncertainty

(Sullivan et al., 2010). For instance, participants "were especially likely to attribute influence over life events to an enemy when the broader social system appeared disordered" (Sullivan et al., 2010; Study 3). The consequences of crowd behaviors like dehumanization and scapegoating in general may be quite severe, and it would be advised to work towards reducing intergroup tensions instead of fueling them (Adler et al., 2022). 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 (Jedwab et al., 2021; Petersson, 2009). 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 (Desmet, 2022).

3.2 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 (Slavich, 2022). Social safety theory would predict that social threat greatly impacts human health and behavior (Slavich, 2022). Social isolation has led to the experience of meaninglessness, although the role of mindsets about the COVID-19 situation has been important (Zion et al., 2022). 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 wellbeing (Zion et al., 2022). In general, the heightened level of mortality salience has been related to heightened frustration and aggression in society (cf. Slavich, 2022) and especially aggression towards those with opposing world views (Pyszczynski et al., 2021). 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 Anderson & Bushman, 2002). 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 in words (e.g., people blaming certain groups for the current situation and thinking aloud about what should happen to such groups), as well as in 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 (Killgore et al., 2021; Mazza et al., 2020).

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 of time, and this often happens when two or more arousing events are close in terms of time (Zilman, 1983). When people are in a survival mode for prolonged periods of time, they become more fearful, distrustful, irritable and aggressive (Bezo & Maggi, 2015). Although a survival mode can be an adaptive response to an immediate threat or existential danger, in the long-run over-exposure of stress-response hormones harms mental health and relationships and leads to intergenerational trauma (Bezo & Maggi, 2015; Brom, 2014). Displaced aggression directed at another person or target, that 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 (Marcus-Newhall et al., 2000).

A study among 2,799 Chinese college students (Ye et al., 2021) 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 world-view (McGregor et al., 1998). Note that terror management can also lead to a more positive way of coping, such as reflecting on the meaning of life (Pyszczynski et al., 2021), and this may be a more effective way of dealing with crisis (de Jong et al., 2020). 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 (Kira et al., 2021). The authors speak of a vicious cycle of inequalities increasing infection and death from COVID-19 and the COVID-19 crisis increasing inequalities further (Kira et al., 2021). 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 (Stein et al., 2021; Schippers, 2020). Individuals more worried of contracting the disease made harsher moral judgments than less worried individuals, even after controlling for political orientation (Henderson & Schnall, 2021). Also, people that were high on health anxiety before the crisis may be

more vulnerable to excessive anxiety about COVID-19 (Dennis et al., 2021), and would be in need of therapeutic interventions (Bendau, 2021),

There is also evidence that the COVID-19 crisis has increased psychological distress that could be related to proximal and distal defences against death-related thoughts (Kira et al., 2021). The crisis has increased anxiety and fear for personal and loved one's physical well-being (Lathabhavan & Vispute, 2021). Conversely, physical activity could act as a buffer (Wright et al., 2021) but the anxiety-buffering outlets such as a social network and sports were inaccessible for many, leaving people vulnerable to experiencing even higher levels of death anxiety (Kira et al., 2021; Pyszczynski et al., 2021). 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 (Alamilla & Cano, 2022; Bambra et al., 2021). According to Broadbent et al, (2022), 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, ore 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 modelled was impossible due to overcrowding and non-compliance necessary to sustain livelihood, the much younger average age while severe COVID affects mostly older people) (Broadbent et al, 2022). Much of these effects have been a result of government response to the crisis and the choices made in this respect (Bambra et al., 2021). In many countries, decisions were made unilaterally and an official narrative was supported and defended (Idler et al., 2022).

4 Centralized decision making and one narrative

Decision making during a health crisis is difficult as many issues need to be considered concurrently with an input from data that may be lacking or massive but still flawed (Khoury & Ioannidis, 2014; Schippers & Rus, 2021). Collective decision-making and intelligence are key to effective decision-making (Kameda et al., 2022). 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 (Hughes et al., 2021). An official narrative approach was followed (Idler et al., 2022; Pleyers, 2020), and counter narratives routinely labelled as misinformation (Greer et al., 2022). Sometimes the experts in control acquire so much

power that they take over even the role of the opposition and dissenters are ostracized (Godlee, 2021; Kaufmann, 2021; Sunstein, 2005). In the current crisis, authorities have used media and public communication to impose their narrative (Pleyers, 2020). 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 (Pleyers, 2020). 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 (Kavanagh & Singh, 2020), leading to distrust in institutions, alienation and avoidance of care (Gostin & Hodge, 2020; National Academy of Medicine et al., 2007; WHO, 2016; Kavanagh & Singh, 2020). The combination of coercive measures and a cancel culture to preserve an official narrative may lead to boomerang effects (Kavanagh & Singh, 2020; Sly, 2020). Public persuasive communication may lead to the opposite effect or behavior than intended (Byrne & Hart, 2009; Cohen, 1962).

Historically, mixing political ideology with science, when the state basically regulates science, has led to disastrous outcomes. For instance, in the former Soviet Union, a geneticist favored by Stalin, dominated biology and agricultural science, rejecting Mendelian genetics. The careers and lives of geneticists who opposed him were destroyed, many of them arrested or killed (Kean, 2017; Kolchinsky et al., 2017). This one-sided approach led to mass starvation in Russia and also, when the Chinese Communists adopted the same approach, starvation killed 30 million people (Kean, 2017). Favoring one ideology at the expense of other views can lead to unwanted outcomes (Joffe, 2021; Rittberger & Richardson, 2019; Schippers, 2020; Schippers & Rus, 2021), for example, using free speech to shut down free speech (Motta, 2018; Teixeira da Silva, 2021). The resulting “cancel culture” may frighten other academics who will then be careful in speaking out and/or publishing on certain topics (Rittberger & Richardson, 2019) Extreme centralized decision making has other disadvantages, including diminishing democracy, diminished freedoms, and threats to human rights (Della Porta, 2020a; Ioannidis & Schippers, 2022; Daly, 2022; Della Porta, 2020b; Seedhouse, 2020). Trust in government may diminish, and support for the NPIs may waver (Schmelz, 2021). While COVID-19 was a major problem, tackling it should never be done to the exclusion of all other problems we face as humanity (Ioannidis, 2020). Making decisions should preferably be done in a way that serves most humans, and science can aid here, but it should not be pretended that “science” is leading decision-making or that it is perfect and error-free (cf. Ioannidis, 2005). Concurrently, journalism and science should avoid propaganda (Seedhouse, 2020). The result may have been suboptimal decision-making (Schippers &

Rus, 2021), people feeling helpless and losing their goal in life (de Jong et al., 2020), and a range of negative economic and health ripple effects (Figure 1).

4.1 Counter movement

Grassroots movements and counter movements have gained more research attention lately (Carty, 2010; Carty & Onyett, 2006; Fournier, 2002; Goodwin et al., 2006; Gulliver et al., 2021; Roy, 2021). 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 (Moyer et al., 2001). 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 (Hamilton & Safford, 2021). People may join counter movements because they give meaning and opportunity to reinstate dearly held values and beliefs (Sovacool & Dunlap, 2022). 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 (Müller-Bachmann et al., 2022). However, such groups often face stigmatization and criminalization, undermining of group identity, and institutionalized social subordination (Fraser, 2000; Müller-Bachmann et al., 2022).

The effectiveness of counter movements

In terms of mass formation, possible counter movements have received far less scientific attention (Maguire, 2020; Mayer & Bert, 2017). 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. Bennoune, 2020; Stott & Radburn, 2020). 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 (Pleyers, 2020). 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 (Sovacool & Dunlap, 2022). Whether or not these movements are effective and what methods are most effective remains a matter of debate (Gulliver et al., 2021). 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 (Gelderloos, 2007). However, recent historical research shows that non-violent approaches are much more effective than violent ones (Janecka, 2021). Regardless, the righteousness of such movements can be debated (Alperstein, 2021). Several authors have claimed that these movements in

current times are misinformed and hence see the rise of these movements as dangerous (Sternisko et al., 2020). However, simply claiming that those movements are misinformed and labelling all information not in line with official guidelines as "conspiracy theories" (e.g., Darius & Urquhart, 2021) may be too naïve. Some counter movements 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 actually able to improve people's lives (Loadenthal, 2017; Sovacool & Dunlap, 2022). A causal relationship between pressure on authorities and change in policies is difficult to determine, but possible (Carty & Onyett, 2006).

Historical research from 1900 to 2006 comparing the effectiveness of in total 323 violent versus non-violent resistance campaigns showed that nonviolent civil resistance was more effective in producing change (Stephan & Chenoweth, 2008). 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 versus 34 % for non-violent ones (Chenoweth et al., 2011; Kraemer, 2021; Pagnucco, 2022). Countries in which there were non-violent campaigns were 10 times more likely to transition to democracies within five years after those campaigns, than countries with violent campaigns. Interestingly, this was independent of whether the campaign succeeded or failed (Chenoweth et al., 2011). 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), when 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(Chenoweth et al., 2011). Preparation of successful campaigns seems crucial, for instance in South-Africa the anti-apartheid movement organized a boycott of white business after preparing for months to become self-sufficient first (Hallward et al., 2017).

The recent decline in 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 actually weaken the opponents sources of power, and less disciplined nonviolent actions (Chenoweth, 2021). Sometimes even one person can make a difference (Said, 2005; Shahinpoor & Matt, 2007). Della Porta (2020c) argues that three kinds of ruptures can be brought about by counter movements, 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 counter movements could be helpful in turning around the decisions of implementing non-effective and harmful NPIs, thereby buffering negative long-term effects.

5 Adverse Outcomes for Humankind

5.1 Hardship and collective trauma

Next to financial insecurity and hardship for many, as well as increasing inequalities as discussed below, aggressive measures also adversely impact physical and mental health (Ando & Furuichi, 2022; Schippers, 2020; Schippers & Rus, 2021). We will focus here on the result of collective trauma or the "psychological reactions to a traumatic event that affects an entire society" (Hirschberger, 2018, p. 1). This kind of trauma can affect the collective memory of an entire group and often invokes some kind of sense making (Erikson, 1976; Maitlis & Sonenshein, 2010). The current crisis is no different in that respect, although the scale of collective trauma might be much bigger than seen before (Stanley et al., 2021). Recent research showed that 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 (Stanley et al., 2021). Although people have a propensity to hide negative emotions and trauma, expression of emotions can yield both individual and collective benefits; sharing may alleviate emotional distress and aid in garnering social support (Basinger et al., 2016).

An important indication of collective hardship is the steep increase in mortality rates of 26% among adults under the age of 45, who have largely been unharmed by Covid-19. Many of the additional deaths were caused by (self)-destructive behaviors such as substance abuse, homicides and, traffic fatalities, as well as lifestyle related deaths (Mulligan & Arnott, 2022).

5.2 Conservation of resources theory

Conservation of Resources theory (COR) can serve as an integrative theoretical lens for understanding how people gain and conserve resources (Hobfoll, 1989, 2011; Hobfoll et al., 2018). 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) (Fuller & Marler, 2009). According to COR, both individuals and groups, and even societies as a whole strive to obtain and maintain resources valuable to them (Hobfoll et al., 2018). Formulated in the context of stress and stressful events, COR is a

motivational theory, with the premise being that an important human bias is to overweight resource loss and underweight resources gain. This bias stems from an evolutionary need to acquire and conserve resources for survival (Hobfoll et al., 2018). COR has been used to explain stress outcomes in various contexts, including organizational settings, following traumatic stress and for everyday stressors (Hobfoll, 1989, 2001).

Hobfoll speaks of "resource caravan passage ways", meaning that the ecological conditions often determine the extent to which people can create and sustain resources (Hobfoll et al., 2018). Indeed, it has been noted that in general, women were already on a resources loss before the crisis, but that the crisis has exacerbated it, and a resource loss spiral can jeopardize progress towards gender equality (Peck, 2021). For instance, as women work predominantly in service sectors, shutdown of many such sectors has disproportionately affected them, leading to the largest gender-unemployment gap ever recorded (Federal Reserve Bank of St. Louis, 2020, see also Peck, 2021). 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 chance of burn-out (Peck, 2021). People became more socially conservative during the crisis, in terms of traditional gender role conformity and gender stereotypes, while political ideology remained constant (Rosenfeld & Tomiyama, 2021). 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 (Hobfoll, 1989, 2001). While during crisis access too many of these resources were blocked, people experienced many other stressors and concurrent loss of so many resources has been unprecedented (cf. de Jong et al., 2020), see Figure 2 for a downward spiral in resources).

Figure 2: Downward spiral of rising inequalities resulting from aggressive and prolonged NPI's

This can be traumatic for many people, especially given the unpredictability about the duration and intensity of the situation (Shelef et al., 2022). Fear has been identified as a strong predictor of posttraumatic stress disorder and this is often accompanied by negative thoughts about the self, others and the world (Shelef et al., 2022). This is compounded by a worldwide sense of insecurity, and loss of personal and social security (Kalinowski et al., 2022), leading to psychological symptoms of grief (Shelef et al., 2022). Also, job loss has been associated with symptoms of grief and loss of meaning in life (Crayne, 2020). Staying-at-home orders are associated with loss of freedom and autonomy as well

as loneliness (Bareket-Bojmel et al., 2021), especially when the measures were perceived as coercive (Ranieri et al., 2021). This may also lead to a fear of coercive policies being enforced over a longer or perhaps indefinite amount of time (Kavanagh & Singh, 2020). Fear- and anxiety-related disorders have spiked since 2020 (Santomauro et al., 2021). Overall, both tangible and intangible resources were lost during the crisis, having an impact on physical and mental health (cf. Rosenfeld et al., 2022; Shelef et al., 2022). People that were subject to extreme resource loss (e.g., losing their income, going through 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 outstretched or exhausted, they may enter a defensive self-preservation mode in which they behave increasingly aggressive and seemingly irrational (Hobfoll et al., 2018; Vashdi et al., 2022). They may defensively try to conserve the remaining resources (Hobfoll, 1989). It has been shown that if people are subject to an increased number of stressful events, prevalence of depression symptoms also increased (Suzuki et al., 2018), and major depression is a leading cause of suicide (Hawton & van Heeringen, 2009). Current research indicates that suicide rates may indeed have increased (Ando & Furuichi, 2022), sometimes after an initial decline in suicides (Tanaka & Okamoto, 2021). People with more resources before the pandemic may be better suited for resource gain (Shelef et al., 2022), which can contribute to psychological well-being, health and functioning (Hobfoll et al., 2012). Groups that had fewer resources from the start included minority groups, youngsters, females and individuals with a mental health history, and economic insecurity (Gauthier et al., 2020; Thomas et al., 2020). In the context of massive and worldwide resource-loss, it may be imperative to focus on resource gain, since resource gains become more potent in the face of significant and/or sustained resource loss (Chen et al., 2015). People in comparable circumstances may differ in how resilient they are in dealing with those circumstances (Chen et al., 2015), and some may experience post-traumatic growth (Calhoun & Tedeschi, 1999). Research by Yi-Feng Chen et al. (2021) stresses the role of proactive personality and organizational support in coping with disruptions during COVID-19. Concluding, COR theory gives theoretical and practical guidance in terms of how increasing tangible and intangible resources after (massive) resource loss can break the downward spiral of losses, inequality and (collective) trauma.

5.1 Prior life circumstances

The extent of harms caused by aggressive and ineffective NPIs may by also be exacerbated by the pre-exiting or induced lack of stability of the social order in a country or region and pre-existing mental health issues (Schippers, 2020; Alonzi et al., 2020). During the crisis those with pre-existing mental

and physical health conditions reported the highest level of emotional distress in terms of anxiety and depression, although mental health deterioration was population-wide (Alonzi et al., 2020). Also, poverty increase in already vulnerable regions made things worse. Additional, extreme events, such as riots and wars may add an extra layer of harm, sometimes on a multiplicative scale (Van Lancker & Parolin, 2020). This can be related to a downward spiral, of loss of livelihood, increased inequalities and mental and physical health decline (See Figure 2).

6 Rising Inequalities

Social inequalities occur when resources within society are distributed unequally, e.g., income, goods, access to information, etc. (Cushing et al., 2015). In the last decades, economic inequality increased in most countries, stabilizing in the 1990s (Neckerman & Torche, 2007), but increasing dramatically since 2020, prompting some authors to refer to this as the "second pandemic" (Fiske et al., 2022). 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 the economic inequality increased (Binns & Low, 2021). Although this trend was already visible before the crisis started (for a review see Neckerman & Torche, 2007), this seems to have accelerated after the start of the crisis (Global Economic Prospects, June 2020). While in the last 25 years, 1.1 billion people were lifted from poverty by means of economic growth (Lustig et al., 2002), during the crisis global extreme poverty rose sharply and in October 2021 it was estimated that 100 million additional people were living in poverty (World Bank, 2022). Very early on in the pandemic, warnings were expressed that the negative effects may outweigh possible positive ones (Ioannidis, 2020; Joffe, 2021; Melnick & Ioannidis, 2020; Schippers, 2020) and ways to optimize decision-making (Schippers & Rus, 2021) and alternative ways forward were offered (Joffe & Redman, 2021). Note that other authors disagree and argue that the NPIs are proportional and have substantial benefits (e.g., Koh et al., 2020; Meyerowitz-Katz et al., 2021). 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 (ref. Chin V, et al. J Clin Epidemiol 2021). A meta-analysis has found very small benefit of lockdowns on COVID-19 mortality rates (Herby et al, 2022), and cost-benefit analyses find that the costs of lockdowns (including what we outline above) far outweigh any potential benefit that may occur (Joffe

& Redman, 2021; Pak et al, 2021). It is likely that debate and disagreement will continue, given that assessments on the relative benefits of lockdown are based largely on weak observational data under very complex circumstances.

Inequalities have several consequences for health, well-being and happiness, and longevity (Arora, 2016; Cushing et al., 2015). Countries that let inequality increase have lower happiness rates than countries with higher equality (Frijters et al., 2020; Bartram, 2022). 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 (Arora, 2016), and happy people live longer (Diener & Chan, 2011), even though the causal mechanisms can be debated. Several meta-analyses have shown a favorable association between psychological well-being and survival (Chida & Steptoe, 2008), and well-being partially mediates the associations of race, poverty, and education with life expectancy (Arora, 2016). Importantly, life satisfaction and optimism about the future, and access to housing, healthcare and perceptions of safety, were also significantly associated with life expectancy (Arora, 2016). Poor housing conditions were related to greater stress and reduced well-being during the COVID-19 crisis (Bower et al., 2021) 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. de Jong et al., 2020; Stantcheva, 2022). The general health and well-being during the crisis has been lowered (for a review see Xiong et al., 2020), especially so for vulnerable groups and disadvantaged countries (McNeely et al., 2020; Yamey et al., 2021). 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 versus due to 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.

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. Of note, for several of these effects, it may be difficult to disentangle the impact of the pandemic the measures taken and their interaction.

6.1 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 helped. 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 physical and mental health outcomes of these groups (Gauthier et al., 2020). 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 (Gauthier et al., 2020). Many countries have chosen to put vulnerable elderly people in complete isolation. This forced social and physical isolation is a serious stressor (Brooks et al., 2020). Resilience may have been further compromised (Holt-Lunstad & Smith, 2012; Holt-Lunstad et al., 2010), creating paradoxical effects (Schippers, 2020). Both regular and routine health care for non-COVID-19 disease was disrupted, posing a threat to health outcomes for many diseases (Bisht et al., 2020; Barnard et al., 2021). The long-term consequences of the relative neglect of the public health care system, and that people were hesitant to visit their physician for non-COVID-19 problems (Czeisler et al., 2020; Imlach et al., 2021; Lange et al., 2020; Nourazari et al., 2021; Saeki et al., 2022), still remain unfathomed. E.g., it was estimated originally that about 28.5 million operations world-wide were postponed during the initial 12-week peak of the crisis (Collaborative, 2020). Once more, vulnerable populations were hit hardest, increasing pre-existing inequalities (Arnault et al., 2021).

6.2 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 (Binns & Low, 2021; Ferreira, 2021; Krauss et al., 2022; Wikipedia, 2022; Yonzan et al., 2021). Hundreds of millions of people were driven into poverty, while others, individuals and corporations, gained (Berkhout et al., 2021) This has led to the paradoxical situation that in some countries people were more worried of starvation than of becoming ill from COVID-19 (Krauss et al., 2022). Almost 4 billion people, half of the world population, lives on less than 6.70 dollar 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 (Buheji et al., 2020). 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." (Yonzan et al., 2021). Income loss was steepest for the poorest 20% of the world,

resulting in the largest impact of the COVID-19 crisis for the world's poorest, increasing the global poverty rate from 7.8 to 9.1 percent by the end of 2021 (Sanchez-Paramo, 2021). 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 (Aspachs et al., 2021). In Spain, it has been estimated that without those interventions, inequality would have increased by almost 30% in just one month (Aspachs et al., 2021; World Bank, 2022). However, young people and foreign-born workers profit less from those interventions and experience a large loss of purpose in life (Borkowski et al., 2021; Blundell et al., 2021; de Jong et al., 2020).

6.3 Educational Inequalities

Early in the pandemic, school closures were widespread. In March 2020 schools closed in 138 countries, affecting 80% of students worldwide (Van Lancker & Parolin, 2020). This 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" (Dorn et al., 2020; for a review see Schippers, 2020; Van Lancker & Parolin, 2020). 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 (Van Lancker & Parolin, 2020). 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" (Engzell et al., 2021, 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, wellbeing, and learning outcomes." (Van Lancker & Parolin, 2020, p. 243), the long-lasting consequences should not be underestimated (Cantillon et al., 2017). Recent studies showed a sharp increase in inequalities regarding education (Engzell et al., 2021; Haelermans et al., 2022) and student well-being (Prowse et al., 2021). In addition, home schooling caused high levels of parental stress (Malhi et al., 2021). Taken together, educational inequalities increased sharply, and student as well as parent well-being was at stake during and after the school closures.

6.4 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 (Fisher & Ryan, 2021). The rising gender inequalities are in the domains of health and well-being, home, domestic violence, work and poverty, and leadership (Fisher & Ryan, 2021). Women reported greater stress and anxiety during lockdowns (Debowska et al., 2020), especially women with children (Benassi et al., 2020), and including female students (Prowse et al., 2021). Health and well-being of women were also disproportionally affected, lowering life expectancy, and increasing suicide rates (Fushimi, 2021). Moreover, reports of abuse, self-harm and thoughts of suicide/self-harm were higher among women (Iob et al., 2020). Women were more likely to experience (physical) aggressive interactions in their dream content (Kilius et al., 2021). Also, women's physical and reproductive health was jeopardized, as many countries reallocated medical care towards COVID-19 patients (United Nations, 2020). Gender-based violence increased at an alarming rate (for a review see Mittal & Singh, 2020). Anxiety and depression tripled for pregnant and postpartum women (Davenport et al., 2020). Mothers were more likely to take on more household chores during the crisis and they were responsible for home schooling (Malisch et al., 2020), and worked on average 5% less, while men worked on average the same number of hours (Collins et al., 2021). Women with young children reduced their work hours four to five time more than fathers (Collins et al., 2021).

In academia, pre-existing inequalities persisted, and new ones arose. While academic gender inequalities were already discussed for quite some time (e.g., Monroe et al., 2008), the crisis increased pre-existing gender inequalities (Woitowich et al., 2021). 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 (Cui et al., 2022). 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 (Cui et al., 2022). This is compounded by women having to take on most household tasks, home schooling, childcare as well as sometimes care for aging parents and extended family (Malisch et al., 2020; Zimmer, 2020). 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 (Azcona et al., 2020). Taken together, women experienced more mental health problems, domestic violence, and a larger burden of household and professional tasks.

6.5 Results of inequalities: Increase in stress

The result of rising inequalities may be an increase in stress and resulting mental health problems (Loeb et al., 2021). A meta-analysis indeed showed that income inequality was negatively related to mental health (Ribeiro et al., 2017). 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 Marmot & Shipley, 1996; Sapolsky, 2004). For instance, Sapolsky researched the question as to 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 (Sapolsky, 2005). Stress levels for low-status baboons was significantly reduced when baboons high in the hierarchy were inadvertently killed due to eating tainted meat (Sapolsky & RI, 2004). 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 (Smith et al., 1990), and these differences in health outcomes and mortality even stretched until after retirement (Marmot & Shipley, 1996). Interestingly, this was the case even though mental health for low status workers, working on stressful jobs with little autonomy, increased after retirement (Fleischmann et al., 2019). It goes without questioning that it is imperative to minimize inequalities.

6.6 Reducing inequalities

Good governance, or the actions governments and organizations take to govern society through laws, norms, power or language is key to reduce inequalities in society (Coccia, 2021). Reducing gender inequalities in academia is also important and several policies are promising (Coleman et al., 2022). An Oxfam report suggested to respond to the crisis with several measures increasing equality (Seery, 2021). In general, community development seems to be a promising avenue in this respect (Erickson, 2011). By coordination and integration of the health sector and community development, this may help streamline efforts to influence health and well-being of especially vulnerable groups (Erickson, 2011). Evidence-based policy making may help reducing inequalities (Eden & Wagstaff, 2021) and buffering the negative effects of the crisis. Going forward, citizens and governments should act to create a more equal and sustainable world (Berkhout et al., 2021). 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 so as to correct them and not repeat them, close the circle of the pandemic and be prepared for future pandemics without disrupting life (Ioannidis, 2022).

7 Could we have done better?

We could have done better in our response to the SARS-CoV-2 pandemic. The leadership for management of the pandemic 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 (Aledort et al., 2007; Inglesby et al., 2006; WHO, 2019; WHO, 2006). These NPIs were also implemented without adequate consideration of their collateral effects (as discussed above, and as 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 (Redman, 2021). 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 SARS-CoV-2 hazard), while also dealing with the indirect effects of the hazard (here, SARS-CoV-2 pandemic and response) (Redman 2021b). The EMA is trained to manage governance, operations, planning, intelligence, logistics, communications, finances, administration, public/private sector collaboration, and education/training activities necessary to manage an emergency (Redman, 2021). Thus, the EMA coordinates the four *simultaneous* EM critical functions: mitigation (separation of the threat from the potential targets or visa-versa), preparedness (building the capability to rapidly respond), response (execution of the capability to prevent injury and loss of life, protect property and critical resources, and meet basic human needs), and recovery (re-establishment of the economy and a state of normal life). Having an EMA coordinate these functions is important because the pandemic is not simply a public health emergency due to the direct effects of severe COVID-19 illness on people, it is a public emergency with direct and indirect effects of the virus and any response to the virus on all of society.

The Emergency Management 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 the SARS-CoV-2 pandemic, are shown in Table 2 (Joffe and Redman 2022; Redman 2021b). By not following the established EM process, the wrong aim, governance, mission analysis, and courses open were more likely to be selected, and there was no published pandemic plan (Redman 2021b). Most, if not all, of the collateral damage and exacerbation of inequality discussed above was predictable and should have been considered in cost-benefit analyses for all possible courses open (Joffe, 2021; Joffe & Redman, 2022; WHO, 2019; WHO, 2006; Aledort et al., 2007; Inglesby et al., 2006).

Of interest, others have come to the conclusion 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, re-inventing the wheel (Joffe, 2021; Schippers & Rus, 2021; Zweig et al., 2021). For example, discussions of cognitive biases (e.g., escalation of commitment, identifiable lives, present, availability, and anchoring biases), information-processing failures (e.g., groupthink, the culture of fear), better frameworks, focused protection, weighing of competing

priorities, and reflexivity ("a deliberate process of discussing team goals, processes, or outcomes") all address issues the EM process is designed to deal with (Godfrey-Smith, 2021; Joffe, 2021; Jung et al., 2021; Mulgan, 2022; Schippers & Rus, 2021; Kulldorff & Bhattacharya, 2021). 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 priorities at this point of endemic SARS-CoV-2 necessary for recovery.

8 Discussion

8.1 Possible ways forward

Governments and public health authorities around the world have felt the urgency to impose decisions on people, while having trouble using evidence-based decision and policy making (Eden & Wagstaff, 2021; Focacci et al., 2022; Schippers & Rus, 2021). This has proven to be quite harmful to many groups in society (Abbasi, 2020; Schippers, 2020). Many scientists also went along with the narrative that the most aggressive NPIs were necessary for the greater good, for instance experts giving advice on how to modify behavior (e.g., Bavel et al., 2020b; Focacci et al., 2022). Others have pointed out that the debate has been highly polarized and should ideally be more open-minded and nuanced (Escandón et al., 2021). It seems that society has fallen prey to groupthink (Joffe, 2021), and that the entrainment of these responses caused the perpetuation of dysfunctional entrenched patterns in responding to the pandemic (Schippers & Rus, 2021). Even so, it seems more important than ever to uphold and renew important values that societies fare by, to enhance well-being of their citizens (Gupta et al., 2021). Healing society should focus on people's dignity, rights, values, and humanity (Gupta et al., 2021). At the same time, it becomes imperative to use evidence-based policy and decision making (Eden & Wagstaff, 2021; Rubin et al., 2021), such as reflexivity (Schippers & Rus, 2021), as used in the emergency management process (Redman, 2021).

It is key to restore health and well-being of the wider population, and create a positive environment in which people can thrive (de Jong et al., 2020). A recent paper even proposed that well-being should be the goal of governments (Frijters et al., 2020). Next to reversing the most aggressive and ineffective policies (Ioannidis, 2022; Joffe, 2022), the way people cope with the situation is important (Schippers, 2020; Freyhofer et al, 2021). Most people seem to be negatively affected in terms of health and well-being, and personality differences may also play a role (Yi-Feng Chen et al., 2021). People that score high on proactive personality are better at spotting opportunities and acting upon them (Bateman &

Crant, 1993). They also are better able to foresee consequences and risks inherent in actions that they take and anticipate on them, affecting environmental change (Crant et al., 2016). Importantly, in the last few years for many people access to intangible resources such as social support, and social belonging were thwarted, as well as access to tangible resources such as income, livelihood, and access to (healthy) food. Loss spirals gain in momentum and magnitude once resource losses accumulate, while resource gain cycles tend to develop slower and are weaker (Hobfoll et al., 2018). This may explain why it seems easier 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 (Kalia, 2021; World Economic Forum, 2021).

8.2 Collective healing and restoring meaning

What is needed in the current situation might be collective healing (Saul, 2013; cf. Conti, 2021). While programs such as Eye Movement Desensitization and Reprocessing (EMDR; Shapiro & Brown, 2019), brainspotting (Grand, 2013) and neurosculpting (Wimberger, 2015) may be effective for relieving (complex) trauma (for reviews see D'Antoni et al., 2022; Gurda, 2015), more scalable positive psychology solutions are needed (Frijters et al., 2020). Many people will feel the need to reinstate a sense of meaning in life (de Jong et al., 2020). Scalable solutions may entail for instance life crafting (reflecting on, setting goals and undertake actions for important areas of life) to find meaning in life, as a written guided online intervention (Schippers & Ziegler, 2019), or via a chatbot (e.g., Dekker et al., 2020; Hoermann et al., 2017). Gratitude and grit may restore a sense of meaning in life and has been related to decreased suicidal ideations (Kleiman et al., 2013). The relationship between gratitude and well-being is well-known (Wood et al., 2010), and it seems that the connection between these is via social connectedness and meaning in life (Liao & Weng, 2018). Communities could investigate possibilities to help many people via scalable solutions (de Jong et al., 2020; Schippers, 2020; Schippers & Rus, 2021). 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 (de Jong et al., 2020; Dekker et al., 2020). Goalsetting also seems promising in terms of reducing the gender and ethnic minority achievement gap for specific populations of students (Schippers et al., 2015). Any interventions need to be rigorously tested for effectiveness and they should preferably be done in concert with other positive psychology interventions tackling educational inequalities (for a review see Easterbrook & Hadden, 2021). At the same time, it is advisable to radically increase voluntariness of

measures. Giving people a choice instead of forcing policies upon them, might make for much more effective interventions. For instance when people work from home voluntarily, they experience fewer adverse effects of teleworking (e.g., Kaluza & van Dick, 2022).

In terms of increasing the base from which decisions are made, less centralized decision making may be desirable, as envisioned in the EM process. This could be achieved by increasing diverse citizen engagement in (global) problems (Carpini et al., 2004), and grass roots movements. In light of the many authoritarian tendencies associated with the pandemic response, it may be worth salvaging democracy (Afsahi et al., 2020; Dostal, 2022; Stoker & Evans, 2022; Ioannidis & Schippers, 2022), and increasing democratization of companies post COVID-19 (Newman & Freilekhman, 2020). The question should be who are best suited to fight the crisis and if it may be better to leave it up to the people's own sense of responsibility to take action after carefully laying out the pros and cons of behavior (Elm & Sarel, 2021). Finally, we should acknowledge that for many of the proposed interventions, we would benefit from having stronger evidence from large (cluster) randomized trials, to understand where they may work, and how much effectiveness we can expect in different populations and circumstances. While the pandemic led to many thousands of randomized trials of drugs, biologics, and vaccines (Hirt et al., 2022; Janiaud et al., 2021), only a dearth of trials were performed on NPIs (Cristea et al., 2020) and the research agenda on psychological and social-level interventions was even more thin. This is a deficiency that needs to be remedied.

9 Conclusion

As the COVID-19 crisis and particularly the response with unprecedented severity and duration of NPIs are related to many negative side effects and seem to increase inequalities for billions of people worldwide (Marmot & Allen, 2020), it becomes imperative to address the negative effects in terms of stress, health and trauma for vulnerable populations (Whitehead et al., 2021). The economic fall-out and consequences for inequality may be felt for years to come (Whitehead et al., 2021). Governments should be well-advised to take well-being as a spearhead for decision-making in the upcoming years (Frijters et al., 2020). It is our hope that with effective interventions the tide may be turned.

10 Author contributions

MS played the primary role in the conception of the manuscript, and wrote, reviewed, and revised the manuscript. JI contributed to writing the manuscript, identifying studies on inequalities, and editing the manuscript. AJ wrote the paragraph on "Could we have done better" and crafted Table 2 and 3. AJ also contributed to writing and editing the manuscript.

11 Conflict of Interest

The authors declares 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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Tables

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.

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 ten 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.	McCartney et al. (2020)
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.	Bajos et al. (2021); Clouston, Natale & Link (2021); Gauvin et al. (2022); Wachtler et al. (2020).
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.	Bajos et al. (2021); Bambra et al. (2021); Barnard et al. (2021); Blundell et al. (2020); Cifuentes et al. (2021); Ribeiro et al. (2021); Liao & De Maio (2021); Perry, Aronson, & Pescosolido (2021); Watkinson et al. (2022)
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.	Cifuentes et al. (2021); Gonzalez-Rabago et al. 2021); Parker et al. (2021); Politi et al. (2021); Reboucas, Falcao, & Barreto (2021); Ribeiro et al. (2021); Jaspal et al. (2021); Nemati et al. (2021); Sepulveda & Brooker (2021)

People living in areas with higher levels of pre-existing inequalities experienced more adverse effects during the pandemic.	Blundell et al. (2020);Gauvin et al. (2022); Bambra et al. (2020); Cerqua & Lette (2022); Clouston et al. (2021); Liao & De Maio (2021); Malmusi et al. (2022); Tan et al. (2021); Sepulveda & Brooker (2021); Wachtler et al. (2020).
Healthy behaviors (e.g., physical activity, healthy eating) were lower, especially for low SES families.	Gao, Davillas & Jones (2022); Gauvin et al. (2022);
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 disproportionally on already disadvantaged groups challenges solidarity and social justice.	Alicandro et al. (2021); Bambra et al. (2020); Cerqua & Lette (2022); Clouston et al. (2021); Liao & De Maio (2021); Malmusi et al. (2022); Tan etal. (2021); Sepulveda & Brooker (2021); Stok et al. 2021; Wachtler et al. (2020).
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.	Jones et al. (2022)
Ethnic minorities had a lower COVID-19 vaccine uptake, higher mortality rates and larger decreases in life expectancy.	Andrasfay & Goldman (2021); Watkinson et al. (2022)
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 rular areas also experienced insecurities due to decreased psychical access to food.	Gundersen et al. (2020); Laborde et al. (2020); Niles et al. (2020); Udmale et al. (2020)
Food insecurities lead to an increase in unhealthy eating behaviors (e.g. consuming high caloric products)	Gao, Davillas & Jones (2022);

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.	Andrew et al. (2020); Haelermans et al. (2022); Katz et al. (2021); Malmusi et al. (2022); Nguyen et al. (2021); Zachreson et al. (2021)
Gender Inequalities	
Women experienced higher rates of mental health issues and psychological deterioration than men.	Borrescio-Higa & Valenzuela (2021); Gao, Davillas & Jones (2022); Gibson et al. (2021); Utzet et al. (2022); Yerkes et al. (2020)
Women experienced a higher increase in suicide rates than men.	Fisher & Ryan (2021); Manun (2021); Nomura et al. (2021);
Women also more often experienced job loss and/or loss of income than men.	Brzezinski (2021); Christl et al. (2022); Dang & Viet Nguyen (2021); Utzet et al. (2022); Yerkes et al. (2020); Perry, Aronson & Pescosolido (2021); Martinez-Bravo & Sanz (2021)
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.	Borrescio-Higa & Valenzuela (2021); Brzezinski (2021); Pitzalis & Spano (2021); Yerkes et al. (2020); Martinze-Bravo & Sanz (2021)
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.	Gorska et al. (2021); Pinho-Gomes et al. (2020); Quak et al. (2021)

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.	Blundell et al. (2020); Guerrina et al. (2021); Politi et al. (2021)
Males experienced higher COVID-19 mortality rates than females.	Blundell et al. (2020); Ribeiro et al. (2021)
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 six 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.	Bellizzi et al. (2020);
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.	Aburto et al. (2022); Cifuentes et al. (2021); Politi et al. (2021):
Children subjected to school closure and other lockdown measures reported adverse mental health symptoms,	Viner et al. (2022);
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.	Bisht (2020); Blundell et al. (2020)

Physical activity health inequality was increased due to differences in access and availability to engage in physical activities during lockdowns.	Shur et al. (2020)
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.	Parker et al. (2021)
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.	De Lorenzo et al. (2022); La Fauci et al. (2022); Jaspal & Breakwell (2022); Stok et al. (2021)
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 versus negative effects for socially disadvantaged people, widening the gap	Bendau et al. (2022); Claes et al. (2021); Fineberg et al. (2021); Gagne et al. (2021); Gauvin et al. (2022); Gao, Davillas & Jones (2022); Jaspal et al. (2022); Sudo (2022) Stok et al. (2021)
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	Esseau-Thomas, Galarraga & Khalifa (2022)

in 150 countries, mainly among already disadvantaged groups. Additionally, the health consequences worsen income inequality.	
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.	Bajos et al. (2021); Bonacini et al. (2020); Blundell et al. (2020); Cerqua & Letta (2022); Delaporte, Escobar, & Pena (2021); Gao, Davillas & Jones (2022); Martinez-Bravo & Sanz (2021); Zachreson et al. (2021)
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.	Palomino, Rodriguez, & Sebastian (2020); Perugini & Vladisavljevic (2021); Shen et al. (2021); Perry, Aronson, & Pescosolido (2021); Stok et al. (2021)
The pandemic did not affect between-country inequality, which continued to decrease as in the previous years.	Deaton, A. (2021)
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 hours. 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.	Andrew et al. (2020); Bacher-Hicks et al. (2021); Devkota (2021); Grewenig et al. (2021); Haelermans et al. (2022); Katz et al. (2021)

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 *objectives* 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 *how* 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 2022; Redman 2021b; Redman 2022

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	Define the mission: to ensure minimum impact of SARS-CoV-2 on society as a whole. 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. Release a comprehensive written Pandemic Response Plan.	Define the mission: to ensure minimum impact of endemic SARS-CoV-2 on society as a whole, *and* to recover from the lockdown-based response collateral damage. Establish the appropriate Governance Task Force, and disband other advisory groups. Release a comprehensive written Pandemic Response and Recovery Plan.
Mitigation	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. Plans for socially vulnerable groups: e.g., temporary housing support to reduce household crowding.	Voluntary focused protection: understand that the risk for those aged <60 years is similar to that from seasonal influenza.
Response	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. Ensure equitable access to healthcare.	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. Removal of fear of future use of NPIs: ensure understanding of accumulated evidence about trade-offs and efficacy in order to end talk of future mandated lockdowns, quarantine of exposed people, school closures, community masking, and border closures. Establish capabilities for endemic SARS-CoV-2: new healthcare surge capacity without plans to sacrifice healthcare for all other conditions.

Recovery	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. Give evidence on the cost-benefit balance of NPIs and lockdowns: explain the difficult trade-offs involved and the justification for focused protection.	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. 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.

References: Joffe and Redman 2022; Redman 2021b; Redman 2022.

Figure 1.JPEG

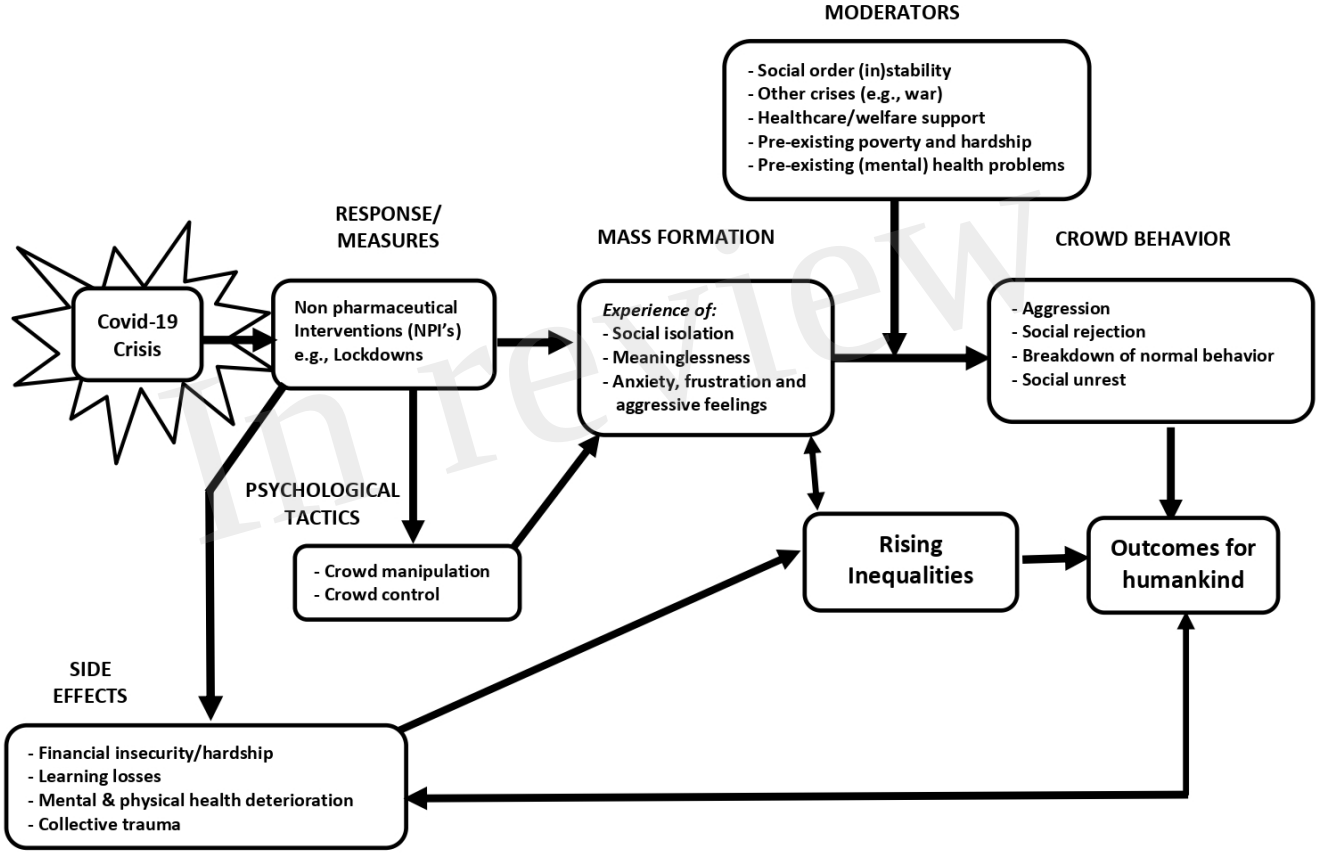

Figure 2.JPEG