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## Original Article

# The Epidemic Failure Cycle hypothesis: Towards understanding the global community's recent failures in responding to an epidemic

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## ABSTRACT

**Background:** Within a few years, the global community has failed twice in responding to large viral infection outbreaks: the Ebola epidemic in 2014 and the SARS-Cov-2 pandemic in 2020. There is, however, no systematic approach or research available that analyses the repeated failures with regard to an adequate response to an epidemic.

**Methods:** For a better understanding of failing societal responses, we have analysed the available research literature on societal responses to epidemics and we propose a framework called the 'Epidemic Failure Cycle' (EFC).

**Results:** The EFC consists of four phases: Negligence, Arrogance/Denial, Panic and Analysis/Self-criticism. These phases fit largely with the current World Health Organization pandemic influenza phases: Inter-pandemic, Alert, Pandemic, Transition. By utilizing the Ebola epidemic and the SARS-Cov-2 pandemic as case studies, we show striking similarities in the response to these outbreaks during both crises. Finally, we suggest three major areas to be of utmost importance for triggering and maintaining the EFC. In terms of ecology, zoonoses, supposed to be the main biological origin for virus epidemics, have been largely neglected by politicians, the media and the scientific community. Socioeconomic and cultural conditions such as harsh living and working conditions as well as conspiracy theories hinder effective preventive and counter measures against epidemics. Lastly, in terms of epistemology, the reliance on knowledge about previous outbreaks has led to slow and inadequate decisions.

**Conclusions:** We conclude that any current society has to be aware of the risks of repeating responses to epidemics that will fail. Being aware of the societal mechanisms that trigger inadequate responses may help to get to more appropriate decisions in the face of an epidemic.

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The global community has failed twice in responding to major virus infection outbreaks within one decade: the Ebola epidemic in 2014 and the SARS-Cov-2 pandemic in 2020. These failings occurred although the weaknesses and non-preparedness of the international public health community and of individual nation-states were well-known [1]. In addition, there was no scarcity of recommendations on the issues that needed to happen. Many national and international organizations as well as committees had provided data and advice in order to get the global community prepared for 'Disease X', the next pandemic [2]. Such recommendations

were suggested both for international organizations like the World Health Organisation (WHO) and for individual countries. As of 2019, these suggestions included topics such as strengthening of health systems, disease surveillance in animals and humans, monitoring of preparedness and biosecurity, strengthening of supply chains and coordination of efforts [3].

Despite these efforts, most countries were caught off guard in early 2020 when the SARS-Cov-2 pandemic spread around the globe. In many countries, health systems were overwhelmed by severe cases of Covid-19 particularly in 2020, protective equipment for health professionals was scarce, supply chains for masks and other equipment were not functioning and international coordination was hampered by unilateral efforts of countries in the Global North to buy such equipment which left poorer countries in huge difficulties.

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The costs of the pandemic in terms of morbidity, mortality, and economic damage are tremendous. As of summer 2021, the global number of confirmed SARS-Cov-2 infections rose above 200 million and the number of deaths due to confirmed infections exceeded 4 million [4]. However, the excess mortality that also includes non-registered cases and deaths due to other reasons during the pandemic was estimated to be 10 million cases [5]. The global economy is expected to lose up to 10 percent of global gross domestic product [6]. Costs of the long-term consequences of a Covid-19 illness are not included in these numbers. For the UK, it is estimated that 30 per cent of the entire Covid-related health burden could be due to the disability that follows many infections [7].

Obviously, many countries did not learn from the failures of the first wave of the pandemic and got hit by subsequent waves that turned out to be more devastating than the first. Two questions are pertinent: (1) What goes repeatedly wrong in terms of national and international epidemic response; and (2) why does it go wrong. This paper seeks to answer these questions by advancing a comprehensive theoretical understanding of epidemic responses and response failures in particular. In doing so, we, firstly, review the current state of research on epidemic response and secondly, we aim at proposing a general and systematic framework that is applicable to any kind of outbreak situation in which the response has turned out to have failed. Informed by a variety of social sciences (e.g., anthropology, political science, sociology), we will outline a framework hypothesis called the Epidemic Failure Cycle (EFC) that describes an ideal-typical course of phases that occur during a failed response to an epidemic. We will utilize the Ebola epidemic 2014 and the Coronavirus pandemic 2020 as case studies in order to support our argument. Finally, we try to provide an overview on the complex issues that need to be considered when it comes to understanding the reasons of the failure cycle.

## Research on epidemic response and response failures

Research on epidemic responses and response failure is commonly restricted to national inquiries, 'After Action Reviews' (AAR) and/or reports on international organizations such as the inquiries into the role of the World Health Organization (WHO) during the Ebola epidemic. The oftentimes local and national reports that look into specific issues of an epidemic pose considerable challenges for achieving generalizable insights from these reports as research on AAR has shown [8]. However, recent research on efforts to cope with infectious disease outbreaks has tried to advance the understanding of what happens and what goes wrong in this regard, as will be outlined in this section.

From a general perspective, epidemics and pandemics usually follow a cycle that consists of four phases such as the current WHO influenza pandemic guidance that names the following: Interpandemic, Alert, Pandemic, Transition and then back to the interpandemic phase [9]. Cycle approaches that describe response details, largely correspond to a four-phase proposal. With regard to HIV/AIDS, early work by medical historian Charles Rosenberg postulated the following: progressive revelation, managing randomness, negotiating public response and an epilogue that looks into the lessons to be learned from the outbreak [10]. More recent research does also suggest that there are at least four phases for describing response cycles, e.g. detection, early response, intervention and post-intervention [11] and another approach that adds surveillance/preparedness prior to the detection phase [12].

In terms of response failures, there is now a common understanding that both national and international responses to epidemics also follow certain cycles that oscillate between the lack of action on one hand and drastic action on the other hand [13]. During the Ebola outbreak 2014, national and international actors seem

to have followed a cycle of fear and apathy [14]. In the light of the SARS-1 outbreak 2002/2003 that could be contained within a short timeframe, and the H1N1-influenza pandemic that was regarded as not as severe as organizations and politicians suggested, decision-makers had refrained from strong response actions in general, so the analysis. When the outbreak got out of control, the affected countries and international organizations responded with strong action as will be demonstrated later in this paper. Other stage theory accounts of health disasters also suggest a cycle consisting of two stages such as crisis and complacency [15] or panic and neglect [13]. The latter terminology was coined by a World Bank panel on health security preparedness financing that found that there was relevant panic during a health disaster like a pandemic and that after some time the exposition to such dangers will be largely ignored and the neglect phase will be entered. These approaches all have in common the notion that non-action will turn into harsh and drastic reaction when the infection outbreak seems to become out of control.

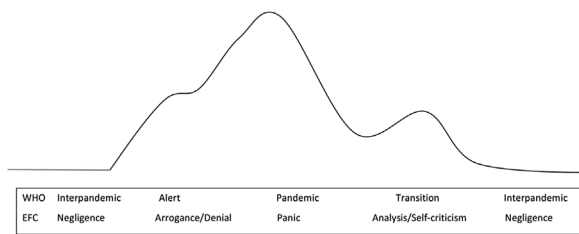
The reasons for response failures are not yet fully understood in every detail. It is, however, obvious that national administrations and international organization face huge difficulties when it comes to learning from previous outbreaks and disasters [16,17]. Starting with formal regulations in terms of what constitutes an epidemic and when to declare one by national authorities and international organizations, research has demonstrated that there are huge inconsistencies and a lack of clarity across recent epidemics [18]. Furthermore, and related to the already mentioned narrow scope of inquiries, generally acknowledged frameworks for the evaluation of response attempts are missing, which makes it difficult to apply results to other settings and outbreaks [19]. It has also been shown that relevant research on infectious diseases and health security issues often does not reach political decision-makers [20].

In addition to the inconsistencies and knowledge gaps that can be seen, political decision-makers face tremendous problems and obstacles when it comes to an epidemic. Epidemic responses can affect local, national and international politics and the consequences are very often felt by poorer communities [21]. Therefore, it is conceivable that politicians are not eager to declare an epidemic in their country, which is commonly regarded as a failure of the particular authorities [22]. In the light of this research, it becomes clearer that poor political mobilization is apparently the key factor for delays in declaring a public health emergency of international concern (PHEIC) [23]. To summarize, epidemic response failures are associated with an inherent cyclicality, knowledge gaps and disincentives for decision-makers.

## The Epidemic Failure Cycle

In what follows, we aim to expand the understanding of response failures by incorporating the current knowledge into a new framework. The Epidemic Failure Cycle (EFC) hypothesis was developed by searching the literature about typical reactions of politicians, international organisations and the public during particular phases of the pandemic cycle. Detailed results of this analysis will be presented in the next section.

We find the panic and neglect phases from the World Bank account to be very useful as a starting point for a framework that describes the cyclical nature of societal response to epidemic threats. As suggested above, we feel, however, that the full cycle needs additional phases, similar to general theories of epidemic cycles. Both, historical [24] and current accounts [25,26] of how societies respond to epidemics highlight the relevance of arrogance or hubris. We would suggest adding this phase as the first one to the panic-neglect cycle. Arrogance, hubris and denial are particu-



**Fig. 1.** Pandemic Phases according to WHO (Pandemic Influenza Risk Management: A WHO guide to inform and harmonize national and international pandemic preparedness and response. Geneva. World Health Organization. 2017) and Epidemic Failure Cycle (EFC).

larly relevant during the alert/detection-phase as depicted by the above-named approaches, where political leaders and the public are struggling to realize that a major threat is looming and that considerable adjustments are needed in order to keep mortality and morbidity low. On the other side of the panic phase, we see the need for a second addition to the panic-neglect cycle. As already indicated and as suggested by the epilogue/post-intervention phase, we see analysis and self-criticism as an important step of societal and organizational reactions to epidemics. After large epidemic outbreaks there are commonly inquiries into how organizations and nation-states have managed the epidemic.

The EFC that we suggest as a framework hypothesis for a comprehensive understanding of a failed response to epidemic threats consists, thus, of four phases: Negligence, Arrogance/Denial, Panic and Analysis/Self-criticism. The EFC phases are largely in parallel to the WHO framework of interpandemic, alert, pandemic and transition phases (Fig. 1). *Negligence* is mainly related to two aspects of epidemic outbreaks. Firstly, potential sources of viral outbreaks are ignored as we have seen repeatedly with the threat by zoonoses. Secondly, the non-preparedness of organizations and nations-states is ignored. *Arrogance/Denial* is displayed when political leaders and the public communicate that – even despite rising numbers of infection – everything is under control and/or that the threat is non-existent or exaggerated. *Panic* comes into play when there are sudden dramatic changes in the response to be seen such as large-scale quarantine or other lockdown measures. *Analysis/Self-criticism* happens commonly after the outbreak is under control where stakeholders reflect on their part during the epidemic and on the lessons to be learned for future waves or outbreaks.

### The Epidemic Failure Cycle during the Ebola outbreak 2014 and the SARS-Cov-2 pandemic 2020

In this section we will recall details on the Ebola outbreak 2014 and the SARS-Cov-2 pandemic 2020. The research literature on the response to the Ebola outbreak stems mostly from anthropological and related social science publications e.g. Refs. [27–29]. The SARS-Cov-2 information is primarily provided by extensive journalistic accounts, particularly from the United Kingdom [30], the United States [31], Switzerland [32] and Germany [33,34], and by a sociological analysis of the initial lockdown from the first author of this paper [35].

*The Negligence Phase:* Like most major virus outbreaks in recent decades, the Ebola virus evolved in wild animals (bats) and eventually crossed the species barrier as zoonosis with different strains. Since its first known eruption in 1976, 28 further known outbreaks occurred mainly on the African continent until 2013 [36]. As becomes apparent by these data, the danger of the Ebola virus was – basically – well known to national and international public health organizations. However, the ‘underlying causes of these epidemics (...) are rarely addressed, at least with any depth or

persistence’, as a keen observer and researcher of zoonoses has remarked [37: 144f.]. In the Ebola situation, however, historical, political and financial issues have to be considered that minimized the chances for an adequate response. The political situation in West Africa was unstable and the region had been hit by civil wars some years before the outbreak. Neoliberal policies had weakened the health care systems [38]. However, according to an outspoken critic of African states’ health policies in the aftermath of the Ebola outbreak, this was not entirely due to the lack of resources but also to misspending [39].

By and large, many of these issues apply to the SARS-Cov-2 pandemic, too. The first major SARS outbreak in Asia occurred in 2002/2003 [40]. According to the WHO ‘Global Study of the Origins of SARS-CoV-2’ [41], it is widely believed that bats play a major role in the origin of the recent pandemic. The threat from coronaviruses that were originally hosted by bats was well understood and reported and was considered to be an ‘urgent issue’ by Chinese researchers just before the pandemic [42]. However, during interpandemic phases, such dangers have been largely ignored by national and international health politics (with some exceptions like the EcoHealth Alliance [43]). In addition to the largely overlooked zoonotic threats, most affected countries had not prepared their health care systems and public health systems to be able to cope with larger outbreaks. In many Global North nation-states, earlier well-resourced response systems had been dismantled in recent decades as only few experts expected them to be needed [33]. In addition, pandemic planning was nearly entirely focused on influenza outbreaks, as this seemed to be the most probable infection to emerge. However, influenza outbreaks have different characteristics than the SARS-Cov-2 pandemic [44]. In terms of epistemology, this reliance on influenza knowledge has led to much confusion and delays during the upcoming course of the pandemic.

*The Arrogance/Denial Phase:* For apparently political reasons, the governments of the three most affected countries during the Ebola outbreak, Liberia, Guinea and Sierra Leone, responded very slowly to the epidemic in early 2014 [27: 40f.]. ‘Governments of affected countries were initially in denial over the occurrence of the disease’ [45]. In order to reassure international trade and travel companies, the then president of Guinea ‘indicated the outbreak was under control’ [46: 74]. Scepticism, distrust and denial among the public were widespread in the region [47]. The perception that the outbreak was under control was also prevalent among international organizations such as the WHO. While humanitarian aid groups on the ground tried to mobilize counter measures, the WHO as well as the US Centres for Disease Control were convinced that the situation could be managed by local public health systems [48]. With hindsight, the main reason for this misperception that led to thousands of deaths, was the conviction that the epidemic would be self-limiting as had been the case with earlier outbreaks [49]. Different to previous times, however, was that the mobility of the populations had massively changed so that rural and urban regions were more closely connected due to increased motorization [27: 48]. Internal political conflicts made it difficult to achieve broad acceptance of the necessary counter measures [46: 74].

In January 2020, most governments and public health administrations outside of Asia were not concerned about the newly emerged Coronavirus. For one, it was expected that the Chinese government had learned their lessons from the SARS-Cov outbreak in 2002/2003 and from further minor eruptions, and then many experts in the public health systems thought they knew how to handle SARS and similar epidemics such as influenza [32,33]. In some countries, this confidence even led to contemplating achieving herd immunity by getting the entire population infected [30: 167ff.]. Similar to governments during the early Ebola epidemic, politicians around the globe, from the German health minister (who asked for ‘attentive calmness’ [33: 46]) to the American president,

reassured their citizens that everything was under control. This was particularly the case before elections as empirical research has demonstrated [50]. But it was not only politicians who were convinced that they had the outbreak under control. In many countries, scientists and public health specialists, too, were communicating the same message (for the US, see Ref. [31], for the UK, see Ref. [30: 91], for Germany, see Ref. [34: 131]). Denial and conspiracy theories concerning the origin of the virus were widespread in many countries [35].

Arrogance and denial, however, did not only occur during the initial phases of the Coronavirus pandemic. Similar attitudes were to be seen before panic measures had to be implemented to break the second and even the third wave in some countries. Repeatedly, politicians tried to convince the public that things were under control and that subsequent waves were unlikely. This was particularly consequential in India where ‘... the government repeatedly boasted that results from serological surveys and from India’s main computer model predicting disease spread showed that the country was in the “endgame” of the pandemic’ [51]. Overall, so the conclusion of the WHO-initiated Independent Panel for Pandemic Preparedness and Response, ‘... countries with the poorest results in addressing COVID-19 had uncoordinated approaches that devalued science, denied the potential impact of the pandemic, delayed comprehensive action, and allowed distrust to undermine efforts’ [52: 33].

*The Panic Phase:* During the second half of 2014, it became more and more obvious that the Ebola epidemic was no longer under control. The entire epidemic was much more widespread than previous ones, urban areas were affected and response teams experienced much more resistance from the public (for differences between the 2014 outbreak and earlier outbreaks, see Ref. [53]). National and international response systems now worked more actively, and several thousand international health staff and aids were deployed to the West African region. The United Nations implemented the UN Mission for Ebola Emergency Response (UNMEER) and the Economic Community of West African States (ECOWAS) funded aid missions [54]. On the ground, Ebola Treatment Units were set up, contact tracing was established and laboratories were scaled up [28].

In the second quarter of 2020, many countries had established countermeasures against the SARS-Cov-2 pandemic that were hitherto unknown. Following the Chinese and the Italian governments, lockdown measures with large scale quarantine and curfews were implemented in several countries, while others with fewer incidence rates only suspended national and international travel, closed shops and venues and ordered citizens to work from home when possible. Treatment facilities were scaled up, test and trace programmes were established and social distancing as well as face mask wearing became mandatory in many, but not all nation-states [35].

*The Analysis/Self-criticism Phase:* The West African Ebola epidemic triggered a considerable number of national and international committee reports. Already in 2015, the WHO issued an ‘Ebola Interim Assessment Panel Report’ that conceded that early warnings about the outbreak ‘... did not result in an effective and adequate response’ [55: 12]. According to the report, large parts of the organization acted too slowly and there were many barriers concerning effective communication within the WHO and with its member states. Among many other reports that followed, a ‘Report of the High-level Panel on the Global Response to Health Crises’ commissioned by the UN Secretary General, deemed the Ebola outbreak to be a ‘preventable tragedy’. The report concluded that ‘... [the] WHO and other agencies misjudged the scale of the threat and their initial response was widely inadequate’ [56]. An independent panel of experts from across the globe concluded in 2015 that ‘systemic weaknesses’ had been exposed by the Ebola

outbreak and provided 10 major recommendations for structural reforms for global and national epidemic response programs [57].

When the first SARS-Cov-2 pandemic wave showed downward infection trends in Europe, several politicians conceded that they could never before have envisaged a situation like what happened in early 2020 [35: 104]. What they deemed as unlikely was that the epidemic could reach European countries within such a short time, if at all [32: 27]. In a detailed analysis of the Swiss response to the first pandemic wave, a report from the ETH Zurich Centre for Security Studies listed several topics that were deemed as insufficient during the first wave [58]. The ‘too little, too late’ conclusion that was also heard after the Ebola pandemic, was again one of the main points mentioned in this report. Switzerland and many other European countries, the report found, had wasted much time during February 2020 due to inaction. Apart from many organizational weaknesses, the report noted that the national pandemic plan was insufficient because it focused on an influenza outbreak where different conditions would have applied that were not present during the SARS-Cov-2 pandemic. The WHO-initiated Independent Panel came to the conclusion that ‘too many national governments lacked solid preparedness plans, core public health capacities and organized multisectoral coordination with clear commitment from the highest national leadership’ [52: 18].

### Potential reasons for failing to respond to epidemics and pandemics

The EFC hypothesis aims at a better understanding of failed responses to epidemics and pandemics. The obvious next question is: why did it happen as it did during the Ebola and during the Coronavirus crises? The answer to the ‘Why question’ is, obviously, a complex issue with many interconnected scientific, social, psychological and political facets. We see primarily five major areas to be of relevance to answer this question: ecology, politics, socioeconomic conditions, human psychology, and epistemology.

*Ecology:* The description of the EFC-Negligence phase has already indicated that zoonoses have been largely neglected as the primary source of virus epidemics by global and national decision-makers [59]. This is particularly true when the danger that is associated with zoonoses is compared to the other current major threat to human life and livelihoods, climate change. The topic of zoonoses has neither reached the agenda of global politics nor has it reached the attention of the media or received the amount of funding that climate change research has rightly got. Similar to climate change, zoonoses are to a large extent man-made. Intrusion into wildlife habitats, the handling and trading of wildlife, deforestation, intensification of farming and even climate change itself are some of the relevant drivers of zoonoses [60,61]. The ecological failure related to virus epidemics needs to be regarded along the same lines as other ecological failures of the global community.

*Politics:* In both situations, politicians and large parts of the public were reluctant to acknowledge the potential severity of the outbreak during the Arrogance/Denial phase. During the Ebola epidemic, social scientists identified wide-spread incomprehension and rejection amongst the Guinean public [46: 72ff.]. As will be outlined below, this can be attributed to a certain degree to human psychology. With politicians, it is unclear what is really believed when the threat of an epidemic is denied and what is used for rhetoric. However, for the Coronavirus pandemic, there is much evidence that both public health administrators and political decision-makers truly believed that they could contain the outbreak [31,32,34]. Additionally, the public in non-Asian countries was deemed to be not ready to accept harsh restrictions in the early days. Political conflicts made it obviously harder to get the message across. This was more than apparent in the United States

during 2020, when even mask-wearing became a politicized issue [31]. For some observers in Guinea, the Ebola outbreak had ‘... an ethno-political dimension’ [46: 75]. Further, distrust between citizens and governments/public health administrations were to be found both in 2014 and in 2020.

**Socioeconomic conditions:** Although the Ebola virus and the SARS-Cov-2 are completely different in biological terms and although the particular social situations in which the epidemic and the pandemic have hit societies are diverse, some striking similarities can be identified that seem to have facilitated the EFC during the Negligence phase. Most importantly, socioeconomic pressure needs to be acknowledged for some population groups. Bushmeat consumption is supposed to be linked to viral exposure for Ebola. However, economic hardship and local habits make it likely for more deprived populations to hunt, trade and eat bushmeat [62,63]. During the SARS-Cov-2 pandemic it became apparent that some of the special working and living conditions such as in the meat industry or in care homes triggered virus transmission [35].

**Human psychology:** For lay people and non-specialist decision-makers, an epidemic is very difficult to comprehend. Incomprehension during the Ebola outbreak was already mentioned. Misconceptions of the exponential growth are a long-standing research topic in psychology [64] and these misconceptions were wide-spread during the Coronavirus pandemic [65]. Additionally, several psychological biases hinder appropriate risk perceptions and subsequent prevention measures. Optimism bias (‘It will not affect me.’) is one of the most prominent in this regard [66,67]. From other health disasters we know that further biases such as inertia bias or simplification bias are strong factors that make it difficult to achieve necessary adaptations to an epidemic threat [68].

**Epistemology:** A largely overlooked factor for delayed and/or inadequate responses to epidemic threats is the application of knowledge from previous outbreaks to new epidemics and pandemics. During both crises, public health experts, politicians and even scientists were surprised by the novelty of either the social situation or the biological characteristics of the virus in question. Medical historians and epidemiologists alike stress the importance of not simply using epidemic history in order to produce guidance for the new situation [69,70]. Whilst during the Ebola epidemic the social ecosystem had changed fundamentally since the last outbreak, in the SARS-Cov-2 pandemic situation experts were wrong on at least two major occasions when they referred to older experience: it was not an influenza pandemic that most experts were expecting, and, contrary to the earlier SARS-Coronavirus, transmission from asymptomatic people was widespread.

## Conclusions

The Epidemic Failure Cycle (EFC) hypothesis provides some suggestions for the analysis of inadequate responses to epidemic threats. We propose that the EFC is an ideal-typical sequence of phases that describes societal dynamics that can occur in any modern society and that are not culturally bound. We also stress that although individual administrations and authorities may not have acted appropriately in every circumstance and although national inquiries may be helpful to uncover those issues, we regard these issues as systemic to a large extent. From a social science perspective, it is striking to see that only very few countries have been able to respond adequately to recent large scale viral infection outbreaks. It is also striking to see that insufficient learning and preparation is not restricted to epidemics but is related to other kinds of health security threats as well [1,17]. This suggests that there are dynamics to be identified that go beyond single nation states, organizations and even epidemics.

From this perspective it becomes clear that a simple ‘lessons learned’ approach may not be a solution to the problem of repeating failures in the post Coronavirus pandemic times. The ‘lessons learned’ approach too often has not led to sustaining changes in the response efforts in general and in preparedness in particular. We see a huge danger that there will be political and research initiatives in the near future that go in the right direction, but that negligence will finally take over due to psychological biases and due to political and financial priorities that may be more imminent than a pandemic where no one knows when the next will come. The headline of an international expert panel paper after the Ebola outbreak is a dire warning in this regard: ‘Post-Ebola reforms: ample analysis, inadequate action’ [71].

What, then, can be learned from disasters such as an epidemic that resemble  $N=1$  events? Sociologists have stressed the need for non-specific preparedness with regard to epidemics and other health disasters that is not based on specific risk assessments and specific previous events that have proven to be deceptive both during the Ebola outbreak and the Coronavirus pandemic [1,35]. In line with this reasoning, the Independent Panel for Pandemic Preparedness and Response has reviewed the issues around misleading guidance on asymptomatic transmission during the early pandemic and has recommended that ‘... there is a case for applying the precautionary principle and assuming that in any outbreak caused by a new pathogen of this type, sustained human-to-human transmission will occur unless the evidence specifically indicates otherwise’ [52:26].

More generally, we suggest that by acknowledging the danger of repeating epidemic failure cycles, decision-makers could become more cautious particularly during the Negligence and Arrogance/Denial phases of epidemics. In addition, we also see a potential that the EFC may serve as a framework that informs empirical research in order to see which contributing factors support or – in cases with better outcomes – prevent the EFC unfolding.

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