

# The Psychosocial Consequences of Disasters and Ways of Coping<sup>1</sup>

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## Abstract

In this article, we attempt to delineate the key elements of what is already known about the psychological consequences of disasters and of ways of coping with them. The Corona Pandemic is the reason for this attempt. There are numerous findings and helpful guidelines for many different disasters, but relatively few in relation to viral pandemics. We assume that knowledge about other forms of disasters can also be useful for helping us cope with the corona pandemic's psychological and social consequences. We will address specific aspects, social and psychological consequences, risks, and preventive or curative intervention possibilities.

Key words: disaster, psychological consequences, risks, interventions

## Introduction

This is a synopsis of key information that we should be aware of when having to deal with natural and man-made catastrophes. There are many countries lacking experience with catastrophes such as the corona pandemic, and which are often poorly equipped to handle other catastrophes adequately (cf. German parliament, Deutscher Bundestag 2013). This applies to administrative and political factors, as well

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to the society as a whole and its helpers. In fact, an average 300 million people around the world are affected by disasters per year. Between 2005 and 2015, approximately 1.7 billion people suffered a catastrophe; 7 million died from the effects of weather or environmental disasters. In the USA alone, between 13 and 19% of the population will suffer just such a catastrophe in their lifetime (Goldman & Galea, 2014; United Nations Office for Disaster Risk Reduction, 2016).

Before addressing the consequences of such catastrophes, let us attempt to define their specific characteristics. We will then discuss particular risks and the groups that are especially vulnerable to being harmed by a disaster. From there, we will attempt to describe the knowledge at hand that has proven to have preventive or curative relevance (and which could prove helpful in handling the current corona pandemic). We will also describe what is known about how aid workers, administrators and civil servants as well as the economy should best prepare for such events.

### **Definition**

Evidence from meta-analytical studies reveals that key life events can function as a major trigger to weaken the immune system, and thus the development of breast cancer and multiple sclerosis. They also have a clear association with mental disorders (especially depression, post-traumatic stress disorder - PTSD). Decisive for this interrelationship is how little control one has over the situation, strongly emotional processes, existential shocks and the lack of coping skills and opportunities.

Particularly relevant here are studies demonstrating a strong link between unemployment and depression, or trauma related to PTSD. In disasters, these pathogenic characteristics are even more extensive or significant, especially when the characteristics below become dominant in an individual (Figley et al. 1995; Math et al. 2015)

- when their ability to understand, predict, and perceive the threat is limited,
- when many people become aware of their limited medical, economic, and administrative capacities to cope,

- when people notice that there are too few means or ways of dealing with or escaping the situation
- when the physical, social, or socio-economic existence of an individual or group is under threat.

Disasters have been studied such psychosocial threats over many years ranging from fire catastrophes, tsunamis or reactor accidents to pandemics (e.g. Rubonis & Bickman, 1991). Although dangerous viruses have threatened mankind for millennia, pandemics have very seldom been investigated. This may be one reason why the level of professional preparation for the current corona pandemic has been minimal. It is entirely possible that all the aforementioned threatening characteristics also apply to the corona pandemic, and even exceed its perilous potential in some respects. Above all, the harmful characteristics are reduced to imperceptible viruses against which there is only partial preventive and curative protection. That is how a situation develops whose menacing nature can only be imagined through still-unreliable media reports of the numbers of deaths. Thus the threat is not just immunological and physical, it is existential. The unpredictability of our financial security is causing many people severe distress, just as the social and financial burden does.

There is ample evidence that the intensity of the stressful burden disasters cause does not just depend on the extent of the aforementioned stress-parameters, it depends also on the individual's and society's means of coping with such stress, as well as their resilience. Such means are reflected in favourable individual coping mechanisms, rational, largely panic-free protective measures, the ability to oscillate between absorbing necessary information and concentrating on life's positive and meaningful aspects, and seeking social support (online and electronic, as well as direct), whereby it is important to avoid fear-mongering news. We emphasise that the continuous consumption of news about disasters is known to provoke very harmful side effects. A meta-analysis of 18 experimental studies delivered irrefutable evidence (that is, very high values) of the negative effects of consuming such news that fall within extreme ranges ( $g = 1.61$ ): in relation to anxiety, the consequences are nearly unimaginable ( $g = 3.11$ ). This means that 65 - 85% of users can be harmed by such messages (Hopwood & Schutte, 2017). On the other hand, a case review revealed the benefit of intentionally

using media that report helpful information, as that reduces insecurity and furthers collective coping efforts (Jurgens & Helsloot, 2018). What we desperately need in this regard is a sober, sensible discourse about the media and their role and responsibilities in periods defined by a pandemic.

There are many harmful coping mechanisms, i.e., over or under-emotionalising the danger, ignoring or disregarding relevant information, wishful thinking, compulsive insistence on maintaining one's habitual quality of life, and harmful health behaviour (drugs, alcohol). Collective, shared coping mechanisms have proven to be beneficial, such as joint problem-solving, the cultivation and activation of community life, solidarity and prosociality (which lower blood pressure and increase longevity, among other things). There is also evidence that encouraging partnerships, and the community support of individual and collective coping processes minimise the perceived threat. The nurturing of hope and altruistic acceptance are also factors that help relieve stress (cf. Cherry et al., 2017; Hobfoll, 1988; Vardy & Atkinson, 2019; Ludin et al., 2019; Marjanovic et al. 2012, Wu et al., 2009). However, it is also evident that these coping tendencies depend on the type of damage that has occurred and on people's empathic abilities. In this line of enquiry, we need to determine which psychosocial interventions benefit these coping mechanisms and can thus trigger altruistic social, political and psychological effects on how stress is experienced.

### **Social consequences**

The immediate individual effects described above trigger serious psychosocial consequences, and shape psychological, social, societal and political life. Investigations of such consequences in the context of disasters have revealed a certain degree of social vulnerability particularly evident among the poor, women, children and elderly (First et al., 2017; Wisner et al. 2004). Factors that affect social vulnerability have much to do with a country's economic situation. They are influenced by the extent of injustice, poverty and social inequality, population growth, health standards, education levels, gender equality, and what is known as social capital (Noel et al., 2018; Wind & Komproe, 2012). Economic status (GDP) predicts social vulnerability most accurately.

Population growth, education, and age (especially children's) have been identified as the second most important factors. Economic cutbacks and the loss of infrastructure were identified as the third most important factor. The percentage of elderly people and unemployed occupies the fourth position, while the fifth most important factor is food security (Zhou et al., 2014).

The economic consequences of natural disasters are dramatic (Benson & Clay, 2004). Fan et al. (2018) estimate that, depending on a country's economic health (favouring the wealthier ones), 28 000 to 390 000 deaths are likely in the event of a pandemic (totalling 720 000 worldwide). The situation is similar economically speaking, as costs are incurred amounting to between 0.3% and 2.6% of national income. The SARS epidemic in 2003 triggered costs of about 52 billion dollars (Institute of Medicine, 2004). It is assumed that the immediate costs are more significant than the indirect ones (Botzen et al. 2019). Particularly affected are the risk groups already mentioned, but also ethnic groups (thus it is not surprising that poor African Americans in the USA are succumbing most frequently to Covid 19). All in all, it is therefore wrong to believe that this virus affects everyone equally. Instead, it exacerbates the social and economic inequalities that existed before the disaster (unemployment and disaster-related stressors have been shown to interact; Lowe et al., 2016). There is ample evidence that the socially and economically deprived carry the highest risk of suffering from nearly all diseases and comorbidities, making them particularly vulnerable to the coronavirus (the lower a given group's socio-economic status is, for example, the more likely they are to suffer from lung and cardiovascular diseases and diabetes; Lampert et al., 2014, 2017). We can also assume that the anticipated economic crisis following a disaster will cause unemployment, poverty, worsening social injustice and the lack of access to social capital, which in turn leads to serious mental health problems (Ehsan & De Silva, 2015; Lund et al., 2010; Paul & Moser, 2009; Uutela, 2010; Wilkinson & Pickett, 2018).

In addition, note the disaster-exploited undermining of democratic freedom (as in Hungary), clampdowns on the freedom of the press, and restricted economic freedom of movement, triggered by citizens strongly dependent financially on their government in the wake of disasters (Kusano & Kemmelmeier (2018). At the same time, right-wing extremist movements are propounding conspiracy theories. The

freedom of the press is also under threat because of some irresponsible contributors in the media who report and often exaggerate physical, civic, and economic horrors without solid evidence or data (in other words, genuine “fake” news). One is reminded that in the case of suicides, the media have learned to act responsibly; the same would be desirable for news reporting on disasters.

Social-structural changes are also evident. The burdens of a disaster extend across the social network (primarily through families; Maeda & Oe, 2017). Effects of stigmatisation and self-stigmatisation have grown within social networks (as the Fukushima reactor accident demonstrated and subsequent radioactive contamination, comparable to a positive corona diagnosis). Experiences of loss, the size of social networks, and lack of intimate relationships are all factors closely related to anxiety disorders, depression, and PTSD in disasters (Bryant, et al., 2017).

To know whether a disaster changes the level of criminal activity, we rely on reports illustrating possibly random clusters of criminal events (Frailing et al. 2015). But there is increasing random-statistical evidence that criminal acts are minimised in the context of a disaster (Leitner et al., 2011). One possible exception is the increase in domestic violence (Gearhart et al. 2018), which particularly affects socially isolated persons (Lauve-Moon & Ferreira, 2007). Note that children in such families can suffer substantially by witnessing their parents’ violent interactions (Catani et al., 2008). We do not know the extent to which these backgrounds contribute (as synergies or mediators) to the development of mental disorders.

### **Mental disorders as consequences of a disaster**

*As early as the 1950s, up to 25% of those affected by a disaster’s immediate consequences were described as people suffering from a disaster syndrome (Tyhurst, 1951). These individuals were described as dazed, stunned or unaware, as if frozen or lost. According to Manfred Lütz, German psychiatrist, psychotherapist, Roman Catholic theologian and consultant to the Vatican, such immediate consequences for mental health are rather insignificant. During an interview on the main German radio station, he claimed that serious mental illnesses will not increase during the corona crisis: “...the situation is frightening and stressful for many, but experience shows that people*

*also get used to difficult situations. In view of the danger affecting everyone, Lütz believes that the division in society will tend to lessen during a disaster. To cope with the situation, it helps to structure one's day and activate oneself, according to Lütz. One could consider how to help others, for example by calling lonely friends and relatives".<sup>3</sup>*

It is incomprehensible that such an expert would make such a statement without knowing the empirical findings. In fact, the opposite is the case. The World Health Organisation shows that mental problems after a disaster range from mild stress to very serious mental health problems. In light of previous experience, the Pan American Health Organization (2012) expects both severe and moderately severe mental disorders (psychoses, depression anxiety disorders) to double. The most common disorders are: adaptation disorders, depression, post-traumatic stress disorder (PTSD), anxiety disorders, unspecific somatic symptoms, chronic grief, substance abuse and as a tendency, suicide (Krug et al., 1998; Mezuk et al. 2009; Neria et al. 2008, 2012; Orui et al., 2018; Takebayashi, et al. 2020).

Meta-analytical investigations underline this result: More than 41 studies have shown that the number of people with mental disorders rose after natural disasters (odd ratio .63). Mental disorders reached values of 1.84. Especially the rates of post-traumatic stress disorders and depression increased significantly after disasters (Beaglehole et al., 2018; cf. Rubonis & Bickman, 1991; Goldman & Galea, 2014). In Udomrath (2008) they fluctuated between 8.6. and 57.3%. Values in 18 worldwide studies were slightly lower, reporting values of up to 3.8% in the over-18-year-olds. During catastrophe-free periods, the highest rates of PTSD worldwide were detected in Ireland with 8.8% (Atwoli et al., 2015). Nevertheless, in meta-analytical studies and reviews, the correlation between parameters of disaster and mental disorders is not extremely high; it is in the middle range regarding anxiety disorders. However, when prior exposure (family problems, trauma, mental disorders) was taken into account, the disaster's effects (odd ratios) varied between 2.9 and 16.4 (Bromet et al., 2017; North & Pfefferbaum, 2013). These effects do not remain stable over time until after the

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<sup>3</sup> 3.4.20; [https://www.deutschlandfunk.de/covid-19-psihiater-luetz-schwere-psychische-krankheiten.2850.de.html?drn:news\\_id=1117160](https://www.deutschlandfunk.de/covid-19-psihiater-luetz-schwere-psychische-krankheiten.2850.de.html?drn:news_id=1117160)

disaster, but many studies report that mental problems persist for 3-5 years (Math et al. 2015).

In addition, the aforementioned results speak a clear language regarding who is at risk. These factors and groups of persons can be classified as vulnerable: female gender, children, elderly, physically disabled and/or unmarried people, ethnic minorities, refugees, poor or homeless people, people living in shelters, substance abusers such as smokers, and people with little social and family support (Neria et al., 2012; Math et al., 2015; Pan American Health Organization, 2012). Meta-analytical results regarding the group of elderly people indicate that their rate of PTSD is more than twice as high as that of younger people (Parker et al., 2016; Siskind et al., 2016). Nevertheless, children and adolescents are also at risk. In particular, a meta-analysis has shown clear developmental deficits after a disaster (Rubens et al., 2018). The type of disaster also plays an important role. For example, the rate of abnormal behavior is higher in violent situations or man-made disasters than in natural catastrophes (Norris et al., 2002).

Finally, note that mental health problems are accompanied by many physical problems related to gastrointestinal, respiratory, neurological, muscular and skin diseases, which also correlate with mental health problems and constitute an additional risk factor in the corona pandemic (Yzermans et al., 2009).

Last but not least, we must consider that it is especially the helpers on the front line coping with the problems in the disaster's wake who carry an extreme risk. They are exposed to primary and secondary traumas, suffer from burnout, everyday stress, and emotional difficulties (Fujitani et al., 2016; Lopes et al., 2012; Nukui, et al., 2017; Tominaga et al. 2019). This also and especially applies to epidemics. High levels of anxiety were demonstrated in China, particularly among women, less educated hospital staff and those with a tendency to post-traumatic symptoms. The extent of posttraumatic symptoms appeared to be directly dependent on the perceived severity of the threat, the workload, quarantine experiences, and the number of people infected within the social network (Wu et al., 2009).

Overall, there are thus obvious negative psychosocial consequences of the stresses a disaster causes depending on its type, social contexts, coping characteristics and

resilience factors. One particular danger should also be highlighted, namely that the numerous psychosocial causes of various mental (and physical) disorders are sometimes attributed to the disaster as a substitute for other psychosocial factors.

However, such events need not always have only negative consequences. There is a rich body of evidence that individuals and societies can prosper after having managed to cope with a disaster. Understanding of the meaning behind a catastrophe and of one's self-efficacy in handling it depends strongly on one's experiences (including intrusive experiences), disaster preparations, professional support, our own impression of our effectiveness, and a differentiated view of our social world (Dursun et al., 2016; Nalipay, et al., 2016; Nalipay & Mordeno, 2018; Tominaga et al., 2019; Weber et al., 2019; Wlodarczyk, 2017).

Numerous examples of altruistic behaviour in the context of disasters have been reported. However, knowledge about its extent and influencing factors (including gender, type of disaster, assignment of responsibility) that play a role during catastrophes is as little known as the conditions that can favourably influence them (Marjanovic, et al., 2012; Rodríguez, et al., 2006).

This positive moment - when we consider a disaster's potential consequences - awakens the hope to discover opportunities for others and ourselves to prepare for and later cope with stressors.

### **Preventive and curative interventions**

Many experiences dealing with disasters have produced a wealth of suggestions and empirical knowledge on how to prevent them and their consequences, and how to handle them effectively. We might assume that the full extent of this knowledge and expertise would be established at various administrative and political levels. This knowledge concerns natural or man-made disasters whose dimensions and repeatability can be estimated. Many countries, however, have little such experience (Roudini et al., 2017). But even those with such experience can be overwhelmed in the case of pandemic disasters such as the corona virus epidemic. Perhaps a brief glimpse

into this experience will prove to be a preventive act that can help prepare us for impending disasters.

At the administrative level, the current proposals have been formulated addressing all areas of life. Here we concentrate on the level concerning mental health. Nevertheless, even within this narrowing perspective, general issues regarding the governmental-organisational preparation for possible disasters are important. With such a view, it must first be ensured that mental health is included in the canon of necessary assistance at all levels, from local to national or international responsibility.

Understandably, there is the danger of focussing on physical events and, because of the urgency of the situation, of neglecting long-term consequences, especially if the importance and impact of mental health is disregarded or underrated at the outset, especially since we know there is close interaction between physical and mental health in association with many disorders.

For many different levels of society, including community-based and networks or more individual approaches, those responsible for mental health must also carry out basic tasks relying on a well-coordinated professional support structure (which is only rudimentary in normal times in different countries, e.g., in Germany). We can only provide a rough outline here. Specific recommendations are available in numerous handbooks that can ultimately only be taken by specific planning or organisational teams (Framingham & Teasley, 2012; Goldmann & Galea, 2014; Halpern & Tramontin, 2007; Housley & Beutler, 2007; Institute of Medicine, 2015; Inter-Agency Standing Committee-IASC, 2007; Jacobs, 2016; Kilmer et al. 2010; Pan American Health Organization, 2012, Phillips, 2009; Shekhar, 2005; Watson et al, 2011):

The institutions and helpers involved must not be just doctors and psychotherapists. Social workers, other psycho-social occupational groups and their services such as counselling centers (from educational, marriage and life-counselling and telephone counselling to addiction and debt-counselling) as well as contact-intensive and psycho-socially effective organisations such as the employment agency, job centre, integration offices or social insurance companies must be involved so that the breadth of the problems arising can be addressed on a co-operative, intersectoral basis.

- The participating institutions and service providers must have agreed on their responsibilities.
- Independent media must be tasked with providing objective, accurate information. They are key information providers for responsible and committed citizens. From the field of health promotion, we know that negative, threatening events can also be confronted if they are accompanied by advice on how to prevent or cope with them.
- In the preventive sense, the main aim is to offer initial psychological aid and support. This is also possible through informal suppliers of assistance. (Leung & Wong, 2005). This means that safety (protection from the threat and potential consequences) is guaranteed, as is access to basic services (including health services). In addition, people must be informed about existing group and individual problem-solving approaches. In order to cope with acute and present stress, the media, radio, etc., broadcast essential information that can give hope and encouragement, above all a return to a daily structure as far as possible (many suggestions come from the field of positive psychological interventions to facilitate meaning and mindful relaxation; Vernberg et al. 2016; see appendix).
- If restrictive interventions (e.g., quarantine) are necessary, the psychological, social and economic risks must be acknowledged and countered by clear communication. The duration of such public-protective measures must be kept as brief as possible. Social stimulation is needed, as are basic goods and adaptation strategies, for example when groups who are not usually together under such conditions are forced to be in close proximity for long periods (i.e., because of home office and closed schools), or when the balance between attachment and withdrawal is made more difficult (Brooks et al. 2020). Helpers must be protected, as they often carry a high risk (see above). Most important would be caring for the helpers' social environment, providing strong, supportive leadership, and encouraging self-protective interventions (e.g., stable family relationships and acceptable level of income and the avoidance of spill-over effects), the application of stress management techniques and systematic involvement of socially supportive groups such as special support groups (Quevillon, 2016; Ulman, 2008). Unfortunately, the empirical knowledge in this area is generally thin on the

strengthening and support of helpers involved in disasters. The helpers themselves see the need for strong support, but the organisations supporting them do nothing or too little to) (Ehrenreich & Elliott, 2004).

We need to encourage mentally-ill people both to request help and benefit from adequate support (Elhai & Ford, 2009). We need better warning systems to help reduce and prevent domestic violence during disasters (First et al., 2017). To this end, existing organisations must be strengthened, the public must be informed and social marketing processes must be implemented for all interventions. More offers of help must be planned, among other things by reactivating retired professional and semi-professional helpers, as long as they are sufficiently protected from the threats.

The service providers must also undergo preparation through simulations and training courses in order to provide the most important psychotherapeutic, social work and medical help well enough, and to do so with mutual support (Shekhar et al., 2006.). The effect of such capacities could be proven in studies (James et al., 2020). There are many training curricula proven to facilitate the development of helper competencies, i.e., knowledge about disasters, their phases, their consequences, basic diagnostic and action-oriented skills, awareness of people living under risky conditions (King et al., 2015).

- Aid providers are committed to fundamental issues such as human rights, participation, providing intersectoral aid, etc. Such organisations must be able to offer a range of services (Gil-Rivas & Kilmer, 2016; Inter-Agency Standing Committee-IASC, 2007):
  - Creation of co-operating intersectoral systems (e.g., education and health).
  - Engaging laypersons and community support systems (e.g., associations; mobilised non-professional support systems that support, structure, and socially connect; Math et al., 2015).
  - Systematic provision of the essential psychotherapeutic forms of help. These essentially correspond to (North & Pfefferbaum, 2013; Pfefferbaum et al., 2017; 2019):
    - Offering first aid, including safety oriented interventions protection, care, crisis interventions, family and network-based and assertiveness

based interventions, easily understandable information and sustained by efficient leadership from assistance teams (Flynn & Morganstein, 2014; Jacobs et al., 2016).

- Reprocessing, Eye Movement Desensitization and Reprocessing (EMDR), stimulus confrontation, debriefing, hypnosis for treating PTSD
- Anxiety and depression treatment via cognitive behavioural therapy
- Pharmacotherapeutic interventions (considered to have little effect).

Note that the  $g = .40$  effect sizes of the meta-analyses of Pfefferbaum et al. (2019) on psychotherapeutic treatment are significantly lower than are interventions for less complex problems, and therefore need to be less ambitious. For instance, the meta-analysis by Gerger et al. (2014) shows that the psychotherapeutic therapy for less traumatic problems had strong effects ( $g = .87$ ), whereas they revealed a medium effect when treating more severe problems ( $g = .42$ ).

- Moreover, the organisations managing disasters should be assessed and adapted according to established quality criteria. (i.e., quality control) (cf. Inter-Agency Standing Committee-IASC, 2007).

For example, Dükers et al (2018) have shown that psychosocial services can be assessed by relying on 44 criteria, which fall into four categories: a) characteristics of the emergency services (e.g., emergency plan in place); b) measurement and assistance policies (e.g., emergency assistance by telephone available); c) central first-aid policies (e.g. offering safety); d) overall final evaluation (e.g., safety of providers). When investigating how various categories are interrelated, 40 aid organisations proved that the more quality criteria that were applied, the better the turned out. Such checklists are also found in other publications (Flynn & Morganstein, 2014; Inter-Agency Standing Committee-IASC, 2007).

All in all, there is both extensive knowledge about the psychosocial consequences of disasters as well as empirical knowledge about how professional aid workers, responsible organisations and politicians should deal with them. Interestingly enough, the people and politicians who are in charge are aware of such guidelines in principle,

but they do not take them seriously. The gap between scientifically-based guidelines and political reality is sometimes very wide.

### Concluding remarks

Aid organisations, political leaders, and the public need to address and digest this information, and plan and prepare an assistance-provision system that works now and will in the future. This means financing the system adequately, and establishing comprehensive training programmes. Above all, however, such preparatory steps must be taken seriously and not neglected, as is possible despite the simulations conducted in 2012 (see German Parliament 2013; Robert Koch Institute, 2007). This should be done in the certainty that investing now in being prepared for a disaster ultimately saves a lot more money in the long run than the lack of such preparation for a catastrophe would cost (it is estimated that an annual expenditure of US\$ 3.1 billion would enable substantial savings; World Bank, 2018; Smith et al., 2019; World Bank Group, 2019). Another thing to consider is that ensuring access to psychosocial care that has been adapted and is prepared for a pandemic is essential; such care must of course suffice in normal times in order to function even better and more often in an emergency. There must therefore be sufficient personnel and lay support systems available that can be called into action and coordinated, as was originally intended with coordinated psychosocial helping system. This means that the quality and structure of psychosocial care provision at normal times must first be improved to be able to undertake the preparations necessary for handling a future disaster.

The fact that many of the experiences are of a more casuistic nature should not deter such investments - Many of the experiences made in dealing with disaster relief systems are casuistic. Never the less investments are necessary Many questions remain open in this overview; just to name a few:

- What are the best instruments for measuring the quality of disaster relief programmes (i.e., quality-assurance parameters)?
- Is the list of risk and resilience factors (significant predictive criteria) sufficient, and how do the various factors interact?

- Which possible planning structures and models, especially those acting as mediators between strong leadership and participation in communities, are the most beneficial in conjunction with what type of disasters and phases in pre-, peri and post-disaster situations?
- Can the many experiences gained be exploited to modify social networks, movements, informal support structures, and general community building into empirically validated measures for coping with disasters?
- How can current preventive and curative interventions be improved on the individual level and supplemented by new intervention forms (e.g., via positive psychological interventions)?
- To know which level of potential aid is particularly important, multi-level analyses must be carried out.
- How can correct and ethically sound decisions be made from different professional perspectives; do complex problem-solving models facilitate these tasks?

This script was written by me during the Corona Pandemic in April 2020 as a means of sublimating my own fears as a 72-year-old author. It is also an attempt not just to help professionals and the general public be prepared for the next catastrophe, but to encourage that rapid retroactive measures be undertaken now, during the current crisis. We must focus on emphasising the importance of mental health and on taking up my organisational proposals to quickly create a well-coordinated preventive and curative aid structure. It is often only necessary that we take advantage of and support the strong initiatives by aid services and civil society. Our greatest accomplishments are reflected not just in the many self-sacrificing aid workers and medical staff (some of whom have succumbed to the virus) and altruistic initiatives, but above all the ethical decision to value the life of each individual and especially the lives of people at risk despite all our usual habits, life goals and economic fears. Dealing with the fear of economic collapse, or personal and social restrictions is sometimes given too much attention (although such fears raise the tendency to commit suicide [there is ample evidence that suicide numbers will never match those of corona victims epidemiologically]).

What is at stake now is the life and reconstruction of a society whose structure enables guidelines for best managing such events - a society no longer dedicated to the self-

interest of capital, but rather to the common well-being of more democratic (and less meritocratic) society in which such terrible events encountered and handled fairly and in solidarity. An essential resistance factor against danger is hope. Many discuss and a potentially different society after this crisis. In the jargon of coping research, we can ask whether this crisis will serve to prepare us for growing collectively, or is merely what those of us in this field often refer to as wishful thinking? It is up to us to determine whether this crisis will be regarded as an opportunity, or the beginning of "business as usual".

## Annex

### Links to psychosocial assistance

#### INTERNATIONAL

##### American Psychological Association (APA)

<https://www.apa.org/practice/programs/dmhi/research-information/pandemics>  
<https://www.apa.org/pubs/highlights/covid-19-articles#most-recent>

##### British Psychological Association

<https://digest.bps.org.uk/2020/03/26/how-psychology-researchers-are-responding-to-the-covid-19-pandemic/>

##### European Community Psychology Association (ECPA)

<http://www.ecpa-online.com/coronavirus-pandemic-resources-platform/>  
<https://ctb.ku.edu/en/coronavirus-tools>  
<https://ctb.ku.edu/en/table-of-contents/participation/encouraging-involvement>  
<http://www.ecpa-online.com/coronavirus-covid-19-the-role-of-psychologists-in-europe/>

##### European Federation of Psychologist' Association

[https://efpa.magzmaker.com/covid\\_19](https://efpa.magzmaker.com/covid_19)  
[http://www.efpa.eu/news/covid-19\\_role-of-psychologists-in-europe](http://www.efpa.eu/news/covid-19_role-of-psychologists-in-europe)

##### Health Promotion Switzerland

<https://dureschnufe.ch/>

##### Greater Good Science (Positive Psychologie)

[https://greatergood.berkeley.edu/article/item/greater\\_good\\_guide\\_to\\_well\\_being\\_during\\_coronavirus?utm\\_source=Greater+Good+Science+Center&utm\\_campaign=f6a0979943-9943-EMAIL\\_CAMPAIGN\\_GG\\_Newsletter\\_Mar\\_26\\_2020&utm\\_medium=email&utm\\_term=0\\_5ae73e326e-f6a0979943-51573611](https://greatergood.berkeley.edu/article/item/greater_good_guide_to_well_being_during_coronavirus?utm_source=Greater+Good+Science+Center&utm_campaign=f6a0979943-9943-EMAIL_CAMPAIGN_GG_Newsletter_Mar_26_2020&utm_medium=email&utm_term=0_5ae73e326e-f6a0979943-51573611)

##### Society for Community Research and Action (SCRA)

<https://www.scra27.org/resources/covid-19/>

##### World Confederation of Cognitive and Behavioural Therapies

[https://www.dgvt-bv.de/fileadmin/Aktuell/CBT\\_to\\_improve\\_mental\\_health\\_during\\_the\\_COVID-19\\_pandemic\\_FINALVersion\\_...\\_.pdf](https://www.dgvt-bv.de/fileadmin/Aktuell/CBT_to_improve_mental_health_during_the_COVID-19_pandemic_FINALVersion_..._.pdf)

##### World Health Organization

[https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf?sfvrsn=6d3578af\\_2](https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf?sfvrsn=6d3578af_2)

## Literatur

- Atwoli, L., Stein, D. J., Koenen, K. C. & McLaughlin, K. A. (2015). Epidemiology of posttraumatic stress disorder: prevalence, correlates and consequences. *Current Opinion Psychiatry*, 28(4), 307–311. doi:10.1097/YCO.000000000000167.
- Beaglehole, B., Mulder, R. T., Frampton, C. M., Boden, J. M., Newton-Howes, G., Bell, C. J. (2018). Psychological distress and psychiatric disorder after natural disasters: systematic review and meta-analysis. *The British Journal of Psychiatry*, 213(6), 716–722. doi: 10.1192/bjp.2018.210.
- Benson, C. & Clay, E. J. (2004). Understanding the economic and financial impacts of natural disasters. Washington, DC.: World Bank. Retrieved 11.4.20:  
<https://openknowledge.worldbank.org/bitstream/handle/10986/15025/284060PAPER0Disaster0Risk0no.04.pdf?sequence=1&isAllowed=y>.
- Botzen, W. J. W., Deschenes, O. & Sanders, M. (2019). The economic impacts of natural disasters: A review of models and empirical studies. *Review of Environmental Economics and Policy*, 13(2), 167–188.
- Bromet, E. J., Atwoli, L., Kawakami, N., Navarro-Mateu, F., Piotrowski, P., King, A. J., Aguilar-Gaxiola, S., Alonso, J., Bunting, B., Demyttenaere, K., Florescu, S., de Girolamo, G., Gluzman, S., Haro, J. M., de Jonge, P., Karam, E. G., Lee, S., Kovess-Masfety, V., Medina-Mora, M. E., Mneimneh, Z., Pennell, B.-E., Posada-Villa, J., Salmerón, D., Takeshima, T. & Kessler, R. C. (2017). Post-traumatic stress disorder associated with natural and human-made disasters in the World Mental Health Surveys. *Psychological Medicine*, 47(2), Jan, 2017 pp. 227–241.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*. Retrieved 12.4.20.  
[https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(20\)30460-8.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)30460-8.pdf).
- Bryant, R. A., Gallagher, H. C., Gibbs, L., Pattison, P., MacDougall, C., Harms, L., Block, K., Baker, E., Sinnott, V., Ireton, G., Richardson, J., Forbes, D., Lusher, D. (2017).

Mental health and social networks after disaster. *The American Journal of Psychiatry*, 174(3), 277-285.

Catani, C., Jacob, N., Schauer, E., Kohila, M. & Neuner, F. (2008). Family violence, war, and natural disasters: A study of the effect of extreme stress on children's mental health in Sri Lanka. *BMC Psychiatry*, 8, ArtID: 33.

Cherry, K. E., Sampson, L., Galea, S., Marks, L. D., Nezat, P. F., Boudoin, K. H. & Lyon, B. A. (2017). Optimism and hope after multiple disasters: Relationships to health-related quality of life. *Journal of Loss and Trauma*, 22(1), 61-76.

Deutscher Bundestag (2013). Drucksache 17/12051. 17. Wahlperiode 03. 01. 2013. Zugeleitet mit Schreiben des Bundesministeriums des Innern vom 21. Dezember 2012 gemäß § 18 Absatz 1 und 2 des Gesetzes über den Zivilschutz und die Katastrophenhilfe des Bundes. Unterrichtung durch die Bundesregierung Bericht zur Risikoanalyse im Bevölkerungsschutz 2012. Retrived 13.4.20. <https://dipbt.bundestag.de/dip21/btd/17/120/1712051.pdf>

Dückers, M. L. A., Thormar, S. B., Juen, B., Ajdukovic, D., Newlove-Eriksson, L., Olf, M. (2018). Measuring and modelling the quality of 40 post-disaster mental health and psychosocial support programmes PLoS ONE, 13(2), ArtID: e0193285.

Dursun, P., Steger, M. F., Bentele, C. & Schulenberg, S. E. (2016). Meaning and Posttraumatic Growth Among Survivors of the September 2013 Colorado Floods. *Journal of Clinical Psychology*, 72(12), 1247–1263.

Ehrenreich, J. H., & Elliott, T. L., (2004). Managing stress in humanitarian aid workers: A survey of humanitarian aid agencies' psychosocial training and support of staff. *Peace and Conflict: Journal of Peace Psychology*, 10(1), 53–66.

Ehsan, A. M, & De Silva, M. J. (2015). Social capital and common mental disorder: a systematic review. *Journal of Epidemiology and Community Health*, 69(10), 1021–1028.

Elhai, J. D. & Ford, J. D. 2009. Utilization of mental health services after disasters. In Y. Neria, S. Galea & F. H. Norris (Eds.), *Mental Health and Disasters* (pp. 366-386). New York: Cambridge University Press.

- Fan, V. Y., Jamison, D. T. & Summers, L. H. (2018). Pandemic risk: how large are the expected losses? *Bulletin of the World Health Organisation*, 96, 129–134.
- Figley, C., Giel, R.; Borgo, S., Briggs, S., & Haritos-Fatouros, M. (1995). Prevention and treatment of community stress: How to be a mental health expert at the time of disaster. In S. E. Hobfoll & M. W. de Vries (Eds.), *Extreme stress and communities: Impact and intervention* (pp. 307-324). Dordrecht, NL: Kluwer.
- First, J. M., First, N. L. & Houston, J. B. (2017). Intimate partner violence and disasters: A framework for empowering women experiencing violence in disaster settings. *Affilia: Journal of Women & Social Work*, 32(3), 390-403.
- Flynn, B. W. & Morganstein, J. C. (2014). Curriculum recommendations for disaster health professionals: disaster behavioral health. Retrieved 11.4.20.  
<https://www.usuhs.edu/ncdmph-learn/Documents/BehavioralHealthRecommendations-201401.pdf>.
- Frailing, K., Harper, D. W., Serpas, R. (2015). Changes and challenges in crime and criminal justice after disaster. *American Behavioral Scientist*, 59(10), 1278–1291.
- Framingham, J. L., & Teasley, M. L. (Eds.). (2012). *Behavioral health response to disasters*. Boca Raton, FL: CRC Press.
- Fujitani, K., Carroll, M., Yanagisawa, R. & Katz, C. (2016). Burnout and psychiatric distress in local caregivers Two years after the 2011 Great East Japan Earthquake and Fukushima Nuclear Radiation Disaster. *Community Mental Health Journal*, 52, 39–45.
- Gearhart, S., Perez-Patron, M., Hammond, T. A., Goldberg, D. W., Klein, A. & Horney, J. A. (2018). The impact of natural disasters on domestic violence: An analysis of reports of simple assault in Florida (1999–2007). *Violence and Gender*, 5(2), 87-94.
- Gerger, H., Munder, T. & Barth, J. (2014). Specific and nonspecific psychological interventions for PTSD symptoms: A meta-analysis with problem complexity as a moderator. *Journal of Clinical Psychology*, 70(7), 601–615.

- Gil-Rivas, V. & Kilmer, R. P. (2016). Building community capacity and fostering disaster resilience. *Journal of Clinical Psychology, 72*, 1318–1332.
- Goldmann, E. & Galea, S. (2014). Mental health consequences of disasters. *Annual Review of Public Health, 35*, 169-183.
- Halpern, J., & Tramontin, M. (2007). *Disaster mental health: Theory and practice*. Belmont, CA: Thomson Brooks/Cole.
- Hobfoll, S. E. (1988). *The ecology of stress*. Washington, DC: Hemisphere.
- Hopwood, T. L. & Schutte, N. S. (2017). Psychological outcomes in reaction to media exposure to disasters and large-scale violence: A meta-analysis. *Psychology of Violence, 7*(2), 316-327.
- Housley, J., & Beutler, L. E. (2007). *Treating victims of mass disaster and terrorism*. Cambridge, MA: Hogrefe & Huber Publishers.
- Institute of Medicine (2004). *Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary*. Washington, DC: The National Academies Press. Retrieved 22.4.20; <https://doi.org/10.17226/10915>.
- Institute of Medicine (2015). *Healthy, Resilient, and Sustainable Communities After Disasters: Strategies, Opportunities, and Planning for Recovery*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/18996>.
- Inter-Agency Standing Committee (IASC) (2007). *IASC guidelines on mental health and psychosocial support in emergency settings*. Geneva: IASC.
- Jacobs, G. A. (Ed.). (2016). *Community-based psychological first aid: A practical guide to helping individuals and communities during difficult times*. Oxford, UK: Butterworth-Heinemann.
- Jacobs, G. A., Gray, B. L., Erickson, S. E., Gonzalez, E. D. & Quevillon, R. P. (2016). Disaster mental health and community-based psychological first aid: Concepts and education/training. *Journal of Clinical Psychology, 72*, 1307–1317.
- James, L. E., Welton-Mitchell, C., Noel, J. R. & James, A. S. (2020). Integrating mental health and disaster preparedness in intervention: A randomized controlled trial

- with earthquake and flood-affected communities in Haiti Psychological Medicine 2020. Retrieved 12.4.20 (<http://creativecommons.org/licenses/by/4.0/>)
- Jurgens, M. & Helsloot, I. (2018). The effect of social media on the dynamics of (self) resilience during disasters: A literature review. *Journal of Contingencies and Crisis Management*, 26(1), 79-88.
- Kilmer, R. P., Gil-Rivas, V., Tedeschi, R. G., & Calhoun, L. G. (Eds.). (2010). *Helping families and communities recover from disaster*. Washington, DC: American Psychological Association.
- King, R. V., Burkle, F. M., Walsh, L. E. & North, C. S. (2015). Competencies for disaster mental health. *Current Psychiatry Report*, 17, 14-23.
- Krug, E. G., Kresnow, M.-J., Peddicord, J. P., Dahlberg, L. L., Powell, K. E., Crosby, A. A. E., Anest, J. L. (1998). Suicide after natural disasters. *The New England Journal of Medicine*, 338(6), 373-378.
- Kusano, K. & Kemmelmeier, M. (2018). Ecology of freedom: Competitive tests of the role of pathogens, climate, and natural disasters in the development of socio-political freedom. *Frontiers in Psychology*, 9, ArtID: 954.
- Lampert, T., Hoebel, J., Kuntz, B., Mueters, S. & Kroll, L. E. (2017). *Gesundheitliche Ungleichheit in verschiedenen Lebensphasen. (Health inequalities at different stages of life)*, Berlin: Robert Koch-Institut.
- Lampert, T., Kroll, L. E., Hapke, U. & Jacobi, F. (2014). Sozio-ökonomischer Status und psychische Gesundheit (Socio-economic status and mental health). *Public Health Forum* 22(22). Retrieved 22.4.20; <http://journals.elsevier.de/pubhef>.
- Lauve-Moon, K. & Ferreira, R. J. (2017). An exploratory investigation: Post-disaster predictors of intimate partner violence. *Clinical Social Work Journal*, 45(2), 124-135.
- Leitner, M., Barnett, M., Kent, J. & Barnett, T. (2011). The Impact of Hurricane Katrina on Reported Crimes in Louisiana: A Spatial and Temporal Analysis, *The Professional Geographer*, 63(2), 244-261, DOI: 10.1080/00330124.2010.547156.

- Leung, T. T. F. & Wong, H. (2005). Community reactions to the SARS crisis in Hong Kong. *Journal of Human Behavior in the Social Environment*, 12(1), 1-22, DOI: 10.1300/J137v12n01\_01; Retrieved 18.4.20 [https://doi.org/10.1300/J137v12n01\\_01](https://doi.org/10.1300/J137v12n01_01)
- Lopes, C. B., Gotway, C. C., Eriksson, C., Zhu, J., Sabin, M., et al. (2012). Psychological distress, depression, anxiety, and burnout among international humanitarian aid workers: A longitudinal study. *Traumatology*, 19(1), 41–48.
- Lowe, S. R., Sampson, L., Gruebner, O. & Galea, S. (2016). Community unemployment and disaster-related stressors shape risk for posttraumatic stress in the longer-term aftermath of hurricane sandy. *Journal of Traumatic Stress*, 29(5), 440-447.
- Ludin, S. M., Rohaizat, M., & Arbon, P. (2019). The association between social cohesion and community disaster resilience: A cross-sectional study. *Health & Social Care in the Community*, 27(3), 621-631. doi: 10.1111/hsc.12674. Epub 2018 Oct 21.
- Lund, C., Breen, A., Flisher, A. J., Kakuma, R., Corrigall, J., Joska, J. A., Swartz, L. & Patel, V. (2010). Poverty and common mental disorders in low and middle income countries: A systematic review. *Social Science & Medicine*, 71, 517-528.
- Maeda, M. & Oe, M. (2017). Mental health consequences and social issues after the Fukushima disaster. *Asia-Pacific Journal of Public Health*, Vol 29(2, Suppl), Mar, 2017 pp. 36-46.
- Marjanovic, Z., Struthers, C. W. & Greenglass, E. R. (2012). Big-picture issues: Research on helping behavior and victims of natural disasters. *Analyses of Social Issues and Public Policy (ASAP)*, 12(1), 289-295.
- Math, S. B., Nirmala, M. C., Moirangthem, S. & Kumar, N. C. (2015). Disaster management: Mental health perspective. *Indian Journal of Psychological Medicine*, 37(3), 261–271.
- Mezuk, B., Larkin, G. L., Prescott, M. R., Tracy, M., Vlahov, D., Tardiff, K. & Galea, S. (2009). The influence of a major disaster on suicide risk in the population. *Journal of Traumatic Stress*, 22(6), Special Issue: Innovations in trauma research methods. 481-488.

- Nalipay, M. J. N. & Mordeno, I. G. (2018). Positive meta-cognitions and meta-emotions as predictors of posttraumatic stress disorder and posttraumatic growth in survivors of a natural disaster. *Journal of Loss and Trauma*, 23(5), 381-394.
- Nalipay, M. J. N., Bernardo, A. B. I. & Mordeno, I. G. (2016). Posttraumatic growth in survivors of a natural disaster: The role of social axioms of religiosity, reward for application, and social cynicism. *The Journal of Positive Psychology*, 12(4), 342-353.
- Neria, Y., Galea, S., Norris, F. H. (2012). Disaster mental health research: Current state, gaps in knowledge, and future directions. In Y. Neria, S. Galea, F. H. Norris (Eds.), *Mental health and disasters*. (pp. 594-610).
- Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: a systematic review. *Psychological Medicine*, 38(4), 467–480.
- Noel, P., Cork, C. & White, R. G. (2018). Social capital and mental health in post-disaster/conflict contexts: A systematic review. *Disaster Med Public Health Preparedness*, 12, 791-802.
- Norris, F. H., Friedman, M. J., Watsin, P. J., Byrne, C. M., Diaz, E. & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry*, 65(3), 207-303.
- North, C. & Pfefferbaum, B. (2013). Mental health response to community disasters: a systematic review. *JAMA*, 310(5), 507-518. doi: 10.1001/jama.2013.107799.
- Nukui, H., Murakami, M., Midorikawa, S., Suenaga, M., Rokkaku, Y., Yabe, H. & Ohtsuru, A. (2017). Mental health and related factors of hospital nurses: An investigation conducted 4 years after the Fukushima disaster. *Asia-Pacific Journal of Public Health*, 29(2, Suppl), 161-170.
- Orui, M., Suzuki, Y., Maeda, M. & Seiji, Y. (2018). Suicide rates in evacuation areas after the Fukushima Daiichi nuclear disaster: A 5-year follow-up study in Fukushima prefecture. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, 39(5), 353-363.

- Pan American Health Organization (2012). Mental health and psychosocial support in disaster situations in the Caribbean. Knowledge for emergency preparedness and response. A joint publication of the mental health program and the area on emergency preparedness and disaster relief. Pan American Health Organization. Washington, D.C.: PAHO. Retrieved 12.4.20.  
[https://www.paho.org/disasters/index.php?option=com\\_docman&view=download&category\\_slug=books&alias=1968-mental-health-and-psychosocial-support-in-disaster-situations-in-the-caribbean&Itemid=1179&lang=en](https://www.paho.org/disasters/index.php?option=com_docman&view=download&category_slug=books&alias=1968-mental-health-and-psychosocial-support-in-disaster-situations-in-the-caribbean&Itemid=1179&lang=en);
- Parker, G., Lie, D., Siskind, D. J., Martin-Khan, M., Raphael, B., Crompton, D. & Kisely, S. (2016). Mental health implications for older adults after natural disasters-a systematic review and meta-analysis. *International Psychogeriatrics*, 28(1), 11-20. doi: 10.1017/S1041610215001210. Epub 2015 Jul 27.
- Paul, K. & Moser, K. (2009). Unemployment impairs mental health: meta-analyses. *Journal of Vocational Behaviour*, 74, 264–282.
- Pfefferbaum, B., Nitiéma, P. & Newman, E. (2019). A meta-analysis of intervention effects on depression and/ or anxiety in youth exposed to political violence or natural disasters. *Child & Youth Care Forum*, 48, 449–477.
- Pfefferbaum, B., Nitiéma, P., Tucker, P., Newman, E. (2017). Early child disaster mental health interventions: A review of the empirical evidence. *Child & Youth Care Forum*, 46(5), 621-642.
- Phillips, B. D. (2009). *Disaster recovery*. Boca Raton, FL: CRC Press.
- Quevillon, R. P., Gray, B. L., Erickson, S. E., Gonzalez, E. D., Jacobs, G. A. (2016). Helping the helpers: Assisting staff and volunteer workers before, during, and after disaster relief operations. *Journal of Clinical Psychology*, 72(12), 1348-1360.
- Robert Koch Institut (2007). Nationaler Pandemieplan- Stand: Mai 2007 (National Pandemic Plan - Status: May 2007). Retrieved 18.4.20;  
<https://edoc.rki.de/bitstream/handle/176904/6227/Pandemieplan2007.pdf?sequence=1&isAllowed=y>.. [National Pandemic Plan - Status: May 2007](#)

- Rodríguez, H., Trainor, J., & Quarantelli, E. L. (2006). Rising to the challenges of a catastrophe: The emergent and prosocial behavior following hurricane Katrina. *Annals of the American Academy of Political and Social Science*, 604, 82–101. Retrieved 22.04.20; <https://doi.org/10.1177/0002716205284677>
- Roudini, J., Khankeh, H. R., & Witruk, E. (2017). Disaster mental health preparedness in the community: A systematic review study. *Health psychology open*, 4(1), 2055102917711307. Retrieved 12.4.20 <https://doi.org/10.1177/2055102917711307>:
- Rubens, S. L., Felix, E. D. & Hambrick, E. P. (2018). A meta-analysis of the impact of natural disasters on internalizing and externalizing problems in youth. *Journal of Traumatic Stress*, 31(3), 332-341.
- Rubonis, A. V. & Bickman, L. (1991). Psychological impairment in the wake of disaster: the disaster-psychopathology relationship. *Psychol Bulletin*, 109(3), 384-399.
- Shekhar, S., van Ommeren, M. & Saraceno, B. (2006). Mental health assistance to populations affected by disasters: World Health Organization's role, *International Review of Psychiatry*, 18, 3, 199-204. DOI: 10.1080/09540260600655755.
- Siskind, D. J., Sawyer, E., Lee, I., Lie, D. C., Martin-Khan, M., Farrington, J., Crompton, D. & Kisely, S. (2016). The mental health of older persons after human-induced disasters: A systematic review and meta-analysis of epidemiological data. *American Journal of Geriatric Psychiatry*. 24(5), 379-388. doi: 10.1016/j.jagp.2015.12.010. Epub 2016 Jan 8.
- Smith, K. M., Machalaba, C. C., Seifman, R., Feferholtz, Y. & Karesh, W. B. (2019). "Infectious disease and economics: The case for considering multi-sectoral impacts." *One Health (Amsterdam, Netherlands)* 7, 100080. doi:10.1016/j.onehlt.2018.100080.
- Takebayashi, Y., Hoshino, H., Kunii, Y., Niwa, S.-I., & Maeda, M. (2020, March 6). Characteristics of disaster-related suicide in Fukushima prefecture after the nuclear accident. *Crisis: The Journal of Crisis Intervention and Suicide*

Prevention. Advance online publication. Retrieved April 12.4.20

<http://dx.doi.org/10.1027/0227-5910/a000679>.

Tominaga, Y., Goto, T., Shelby, J., Oshio, A., Nishi, D. & Takahashi, S. (2019). Secondary trauma and posttraumatic growth among mental health clinicians involved in disaster relief activities following the 2011 tohoku earthquake and tsunami in japan. *Counselling Psychology Quarterly*, Aug 8, 2019. Retrieved 12.4.20  
<http://dx.doi.org/10.1080/09515070.2019.1639493>

Tyhurst, J. S. (1951). Individual reactions to community disaster: the natural history of psychiatric phenomena. *American Journal of Psychiatry*, 107, 764–769.

Udomratn, P. (2008) Mental health and the psychosocial consequences of natural disasters in Asia, *International Review of Psychiatry*, 20(5), 441-444,  
DOI:10.1080/09540260802397487.

Ulman, K. H. (2008). Helping the helpers: Groups as an antidote to the isolation of mental health disaster response workers. *Group*, 32(3), Special Issue: Trauma, group, and couple therapy. 209-221.

United Nations Office for Disaster Risk Reduction (2016). Centre for Research on the Epidemiology of Disasters. The human cost of weather-related disasters 1995-2015. Retrieved 11.4.2020, from  
[http://www.unisdr.org/files/46796\\_cop21weatherdisastersreport2015.pdf](http://www.unisdr.org/files/46796_cop21weatherdisastersreport2015.pdf).

UUtela, A. (2010). Economic crisis and mental health. *Current Opinion in Psychiatry*, 23, 127–130.

Vardy, T. & Atkinson, Q. D. (2019). Property damage and exposure to other people in distress differentially predict prosocial behavior after a natural disaster. *Psychological Science*, 30(4), 563-575.

Vernberg, E. M., Hambrick, E. P., Cho, B., Hendrickson, M. L. (2016). Positive psychology and disaster mental health: Strategies for working with children and adolescents. *Journal of Clinical Psychology*, 72(12), 1333-1347.

- Watson, P. J., Brymer, M. J., & Bonanno, G. A. (2011). Postdisaster Psychological Intervention Since 9/11. *American Psychologist*, 66, 482-494. doi: 10.1037/a0024806.
- Weber, M. C., Pavlacic, J. M., Gawlik, E. A., Schulenberg, S. E. & Buchanan, E. M. (2019). Modeling resilience, meaning in life, posttraumatic growth, and disaster preparedness with two samples of tornado survivors. *Traumatology*. Advance online publication: Retrieved 19.4.20. <https://doi.org/10.1037/trm0000210>.
- Wilkinson, R. & Pickett, T. (2018). *The inner level. How more equal societies reduce stress, restore sanity and improve everyone's well-being*. New York: Penguin.
- Wind, T. R., & Komproue, I. H. (2012). The mechanisms that associate community social capital with post-disaster mental health: A multilevel model. *Social Science & Medicine*, 75, 1715–1720. doi:10.1016/j.socscimed.2012.06.032
- Wisner, B., Blaikie, P., Cannon, T., Davis, I. (2004). *At risk: Natural hazards, people's vulnerability and disasters*, 2nd ed. London: Routledge 2004.
- Wlodarczyk, A., Basabe, N., Páez, D., Villagrán, L., Reyes, C. (2017). Individual and collective posttraumatic growth in victims of natural disasters: A multidimensional perspective. *Journal of Loss and Trauma*, 22(5), 371-384.
- World Bank (2018). *One health. Operational framework for strengthening human, animal, and environmental public health systems at their interface*. <http://documents.worldbank.org/curated/en/961101524657708673/pdf/122980-REVISED-PUBLIC-World-Bank-One-Health-Framework-2018.pdf>.
- World Bank Group (2019). *Pandemic preparedness financing status update*. Retrieved 15.4.20; [https://apps.who.int/gpmb/assets/thematic\\_papers/tr-4.pdf](https://apps.who.int/gpmb/assets/thematic_papers/tr-4.pdf).
- Wu, P., Fang, Y., Guan, Z., Fan, B., Kong, J., Yao, Z., Liu, X., Fuller, C. J., Susser, E., Lu, J. & Hoven, C. W. (2009). The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. *Canadian Journal of Psychiatry*, 54, 302–311.

Yzermans, J., van den Berg, B. & Dirkzwager, A. J. E. (2009). Physical health problems after disaster. In Y. Neria, S. Galea & F. M. Norris (Eds.), *Mental health and disasters*. (pp. 67-93). Cambridge: Cambridge University Press.

Zhou, Y., Li, N., Wu, W., Wu, J., Shi, P. (2014). Local spatial and temporal factors influencing population and societal vulnerability to natural disasters. *Risk Analysis*, 34(4), 614-639.