



Invited Commentary | Psychiatry

# Cumulative Adverse Mental Health Outcomes After Concurrent Disasters— Social, Scientific, and Policy-Making Implications

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Garfin et al<sup>1</sup> collected data from 1637 residents in Florida before and after Hurricane Irma in September 2017 and after Hurricane Michael in October 2018 by using a 3-wave panel survey and investigated whether repeated exposure to hurricanes directly, indirectly, or through media was associated with mental health, while controlling for prehurricane mental health and other background characteristics. The authors found that (1) an individual's own experience of being affected, the experience of knowing someone who was affected, and the number of hours of Hurricane Irma-related media exposure were positively associated with posttraumatic stress symptoms and functional impairment after Hurricane Michael 1 year later and (2) Hurricane Irma-related posttraumatic stress symptoms were positively associated with posttraumatic stress symptoms and functional impairment after Hurricane Michael 1 year later, even after controlling for demographic characteristics, socioeconomic characteristics, life events, physical loss owing to hurricanes, and prehurricane mental health. The authors interpreted these outcomes as sensitization owed to repeated or continued exposure to stressful circumstances. In other words, posttraumatic stress may cumulatively increase with repeated exposure to difficult situations. Garfin et al<sup>1</sup> noted that exposure included indirect experience through knowing someone who was affected and indirect exposure through the media. Difficult experiences heard from others or observed through the media and one's own difficult experiences may cumulatively accompany posttraumatic stress symptoms. The authors also found that background characteristics were associated with posttraumatic stress symptoms after hurricanes. However, a critical contribution of the article is that the authors identified cumulative distress associated with direct and indirect exposure to natural disasters even after controlling for a wide range of background characteristics. This finding is critical because it is related to the understanding of humans by social scientists, notably economists and policy makers.

There are logically 2 possibilities for how humans behave during shocks and interventions. The first is habituation; people tend to become used to things. The other is an association of cumulative shocks and interventions with a change in mental health outcomes. Works in behavioral economics have found that the effects of policy intervention, such as saving water or energy, helping the poor, and accommodating immigrants, diminish from within a week to, at the longest, 1 year.<sup>2,3</sup> People tend to habituate in the way of "action and backsliding."<sup>4</sup> However, according to the article by Garfin et al,<sup>1</sup> with regard to experiences of being directly or indirectly exposed to concurrent severe disasters, people might not habituate. Instead, their mental health might be cumulatively adversely affected.

These findings have implications beyond medical science and public health. Concurrent disasters and possible support for affected regions have been critical issues in development economics. The immediate concerns have been physical and financial losses owing to disasters. However, overcoming such physical and financial losses substantially depends on informal and personal networks between affected residents, as empirical and experimental works of development economics have shown.<sup>5</sup>

Informal and personal networks, by construction, rely on the mental resilience of the constituents of local communities. Garfin et al<sup>1</sup> found that indirect exposure to hurricanes through talking with neighbors and through the media was positively associated with cumulative posttraumatic stress symptoms. This finding suggests that the survey respondents may have lived in

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informal networks and felt the pain of their neighbors through these networks and through the media. Repeated or continued exposure to disasters could erode informal networks that are used to help overcome the disasters, both directly through one's own posttraumatic stress and indirectly through posttraumatic stress symptoms associated with sympathy with neighbors within these networks.

The significance of informal relationships, which is referred to as *social capital*, and disaster-affected mental health is not limited to low-income countries. For example, research during the COVID-19 pandemic has revealed that social capital may help people cope with the adverse outcomes of the pandemic through protective behaviors in high-income countries.<sup>6</sup> However, the pandemic has been associated with an increase in depressive symptoms.<sup>7</sup> If the resilience of social capital at least partially depends on the mental health of its network constituents, the cumulative damages associated with the prolonged pandemic might corrode social capital through the mental health channel.

The design of the survey by Garfin et al<sup>1</sup> is transparent and well-standardized. The experiences of hurricane-affected people in the US are likely to be similar to those of typhoon-affected people in East Asia and cyclone-affected people in Southeast Asia. Therefore, studies replicating that of Garfin et al<sup>1</sup> should be encouraged worldwide. Moreover, the recurrent waves of COVID-19 and the increase in the number of infections may similarly be associated with adverse mental health outcomes, which suggests a need for replication studies regarding the COVID-19 pandemic.

In summary, the findings of Garfin et al<sup>1</sup> may encourage economists to address possible cumulative mental stress, adding to physical and financial losses when they design a panel survey to investigate the resilience of a society against natural disasters and pandemics, considering a possible channel between the cumulative distress associated with direct or indirect exposure to disasters and pandemics and the resilience of social capital to endure disasters and pandemics. By doing so, economic research on natural disasters and pandemics would have more practical policy implications to mitigate damage. Basic medical and public health sciences research may help applied social sciences research and policy making. The article by Garfin et al<sup>1</sup> is such a contribution.

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## ARTICLE INFORMATION

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## REFERENCES

1. Garfin DR, Thompson RR, Holman EA, Wong-Parodi G, Silver RC. Association between repeated exposure to hurricanes and mental health in a representative sample of Florida residents. *JAMA Netw Open*. 2022;5(6):e2217251. doi:[10.1001/jamanetworkopen.2022.17251](https://doi.org/10.1001/jamanetworkopen.2022.17251)
2. Ferraro PJ, Price MK. Using nonpecuniary strategies to influence behavior: evidence from a large-scale field experiment. *Rev Econ Stat*. 2013;95(1):64-73. doi:[10.1162/REST\\_a\\_00344](https://doi.org/10.1162/REST_a_00344)
3. Keisuke K, Masaki N. Persistent mind: the effects of information provision on policy preferences. Institute of Social Science, University of Tokyo; 2021. CSRDA Discussion Paper Series No. 5. Accessed May 12, 2022. <https://csrdadps.com/paper/5>
4. Allcott H, Rogers T. The short-run and long-run effects of behavioral interventions: experimental evidence from energy conservation. *Am Econ Rev*. 2014;104(10):3003-3037. doi:[10.1257/aer.104.10.3003](https://doi.org/10.1257/aer.104.10.3003)
5. Shoji M. Guilt and prosocial behavior: lab-in-the-field evidence from Bangladesh. *Econ Dev Cult Change*. 2022;70(2):823-833. doi:[10.1086/713879](https://doi.org/10.1086/713879)

6. Barrios JM, Benmelech E, Hochberg YV, Sapienza P, Zingales L. Civic capital and social distancing during the Covid-19 pandemic. *J Public Econ*. 2021;193:104310. doi:[10.1016/j.jpubeco.2020.104310](https://doi.org/10.1016/j.jpubeco.2020.104310)
7. Long D, Haagsma JA, Janssen MF, Yfantopoulos JN, Lubetkin EI, Bonsel GJ. Health-related quality of life and mental well-being of healthy and diseased persons in 8 countries: does stringency of government response against early COVID-19 matter? *SSM Popul Health*. 2021;15:100913. doi:[10.1016/j.ssmph.2021.100913](https://doi.org/10.1016/j.ssmph.2021.100913)