Using panel data to understand the mental health effects of severe flooding in Thua Thien Hue province in Central Vietnam

Philip Bubeck, Thi Dieu My Pham, Annegret H. Thieken

University of Potsdam, Institute of Environmental Science and Geography, Germany

bubeck@uni-potsdam.de

Background

Every year, millions of people are affected by flooding. In addition to physical destruction, current research suggests that floods can also have considerable effects on the mental health of those affected. However, the literature in this research domain is still scarce, focuses on developed countries, and mostly employs cross-sectional research designs (i.e. surveys taken at one point in time, only). Consequently, insights into the dynamics and heterogeneity of individual response trajectories as well as risk and protective factors from a region in the Global South are largely lacking. A better understanding of the psychological impacts of flood hazards is needed, though, in order to build more climate-resilient societies.

Objective: To improve our understanding of the psychological impacts of flooding over time.

Study area

Thua Thien Hue is a coastal province in central Vietnam (Figure 1). The Tam Giang Lagoon and adjacent coastal areas are the basis for the livelihoods of many poor and vulnerable people, who directly depend on these natural resources. Thua Thien Hue is frequently affected by flooding from heavy rainfall, the Perfume River and the sea. In addition to the chronic stress and shocks caused by flooding, also socio-economic factors like unstable livelihoods and the fast disappearance of ecosystems undermine the resilience of societal groups already vulnerable to climate change. In the future, flood risks are projected to increase due to global warming, population growth and urbanization.

Figure 1: Case study area – Thua Thien Hue province in Central Vietnam.

The flood event of October 2020

Following a series of tropical storms, Thua Thien Hue province was hit by one of the most severe flood events in recent decades in October 2020. According to analyses of the United Nations Institute for Training and Research (UNITAR), about 70,000 people were exposed or living close to flooded areas in the province. Figure 2 shows the flood in October 2020 as derived from satellite images.

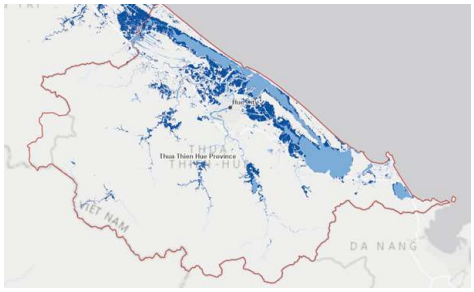

Figure 2: Flood Waters detected by satellite image (Sentinel-1) in Thua Thien Hue Province as of 22nd October 2020. Data source: https://www.unitar.org/maps/map/3142.

Impacts of flooding on mental health

The cross-sectional literature suggests that flood-related psychological impacts can be severe and long-lasting (*Zhong* et al. 2018). For the study area, we find that flood impacts significantly reduce subjective well-being of individuals (*Hudson* et al. 2019). This notion is also supported by a recent panel study of flood-affected citizens in Germany. In this study, respondents were surveyed three times over a period of nearly four years following a severe flood in 2013. Results show that many respondents report that they have not recovered even four years after the flood event (Figure 3).

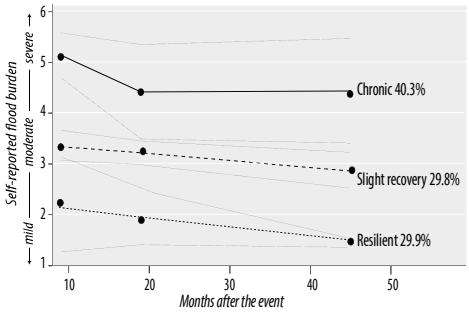

Figure 3: Trajectories of recovery for individuals affected by a severe flood event in Germany in May/June 2013. Source: Bubeck at al. (2020).

Mental health screening tool

Mental health of the respondents is assessed using the Kessler psychological distress scale (K6), which is a widely used scale of psychological distress in general populations (*Kessler* et al. 2002). Core questions of the scale are depicted in Figure 4.

During the past 30 days, about how often did you feel …	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. …nervous?	1	2	3	4	5
b. …hopeless?	1	2	3	4	5
c. …restless or fidgety?	1	2	3	4	5
d. …so depressed that nothing could cheer you up?	1	2	3	4	5
e. …that everything was an effort?	1	2	3	4	5
f. …worthless?	1	2	3	4	5

Figure 4: Questions of the K6 Distress Scale asked to respondents to screen for psychological distress following the flood event.

The panel survey

Face-to-face interviews are carried out in four different locations twice per year, i.e. before and after the flood season over a period of three years. Specific individuals are followed over time. The first survey was implemented in April/May 2021. In addition to the K6 distress scale, flood impact characteristics, socio-economic characteristics, adaptation behavior, perceptions of ecosystems, and personality traits are elicited.

Preliminary results and outlook

The K6 distress scale ranges from 0 to 24, indicating increasing levels of mental distress. Using standard cut-off points of ≥ 5 and < 13 for moderate mental distress and ≥ 13 for severe mental distress, we find that 3.6% of the respondents show severe mental distress, while nearly 26% show moderate levels of mental distress (Figure 5).

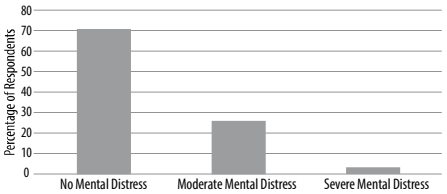

Figure 5: Prevalence of mental distress in the sample, using standard cut-off points for moderate and severe mental distress (n = 387).

Next, we will examine if we can identify risk and protective factors for mental distress. With results from additional waves, differences in response trajectories shall be identified and explained, improving our understanding of mental health effects of flooding and recovery processes. Insights of the study can help to inform disaster risk management to pro-actively address mental health issues following flood hazards.

Bubeck, P., Berghäuser, L., Hudson, P., & Thieken, A. H. (2020). Using panel data to understand the dynamics of human behavior in response to flooding. Risk Analysis, 40(11), 2340-2359.

Zhong, S., Yang, L., Toloo, S., Wang, Z., Tong, S., Sun, X., & Huang, C. (2018). The long-term physical and psychological health impacts of flooding: a systematic mapping. Science of the total environment, 626, 165-194.

Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S.-L.T., Walters, E.E., & Zaslavsky, A. (2002). Short screening scales to monitor population prevalances and trends in nonspecific psychological distress. Psychological Medicine. 32(6), 959-976.

Hudson, P., Pham, M., & Bubeck, P. (2019). An evaluation and monetary assessment of the impact of flooding on subjective well-being across genders in Vietnam. Climate and Development, 11(7), 623-637.