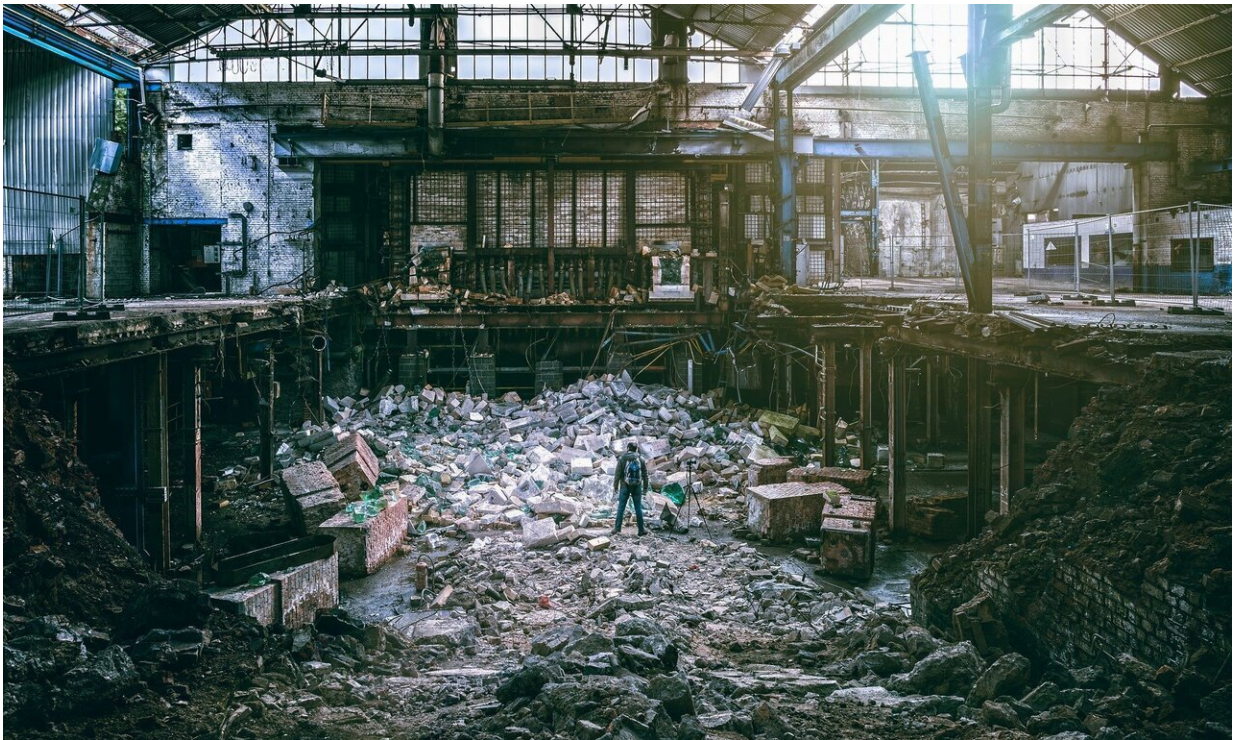


# Effective government saves lives in cyclones, other disasters

November 4 2020, by Kate Blackwood

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Credit: CC0 Public Domain

In 2008, Cyclone Nargis killed more than 138,000 people in Myanmar. It was a powerful category 3 or 4 storm at landfall, but tropical storms with similar wind speeds that year resulted in far fewer fatalities in other countries.

Elizabeth Tennant, postdoctoral associate in economics at Cornell University, wondered: What made the difference?

To quantify the relationship between natural disaster outcomes and the effectiveness of governments and other institutions, Tennant and co-author Elisabeth Gilmore, associate professor in the Department of International Development, Community and Environment at Clark University, analyzed data from more than 1,000 [tropical cyclones](#) from 1979 to 2016. They found, in a paper published Nov. 3 in *PNAS*, that effective national and [local governments](#) are associated with fewer deaths from tropical cyclone disasters—even in countries with similar levels of wealth and development.

Moreover, storms concentrated in areas with weaker public services, as indicated by elevated [infant mortality rates](#), are especially deadly, the researchers found.

"These results suggest that policies and programs to enhance institutional capacity and governance can support risk reduction from [extreme weather events](#)," Tennant wrote.

One of the original motivations of the study, Tennant said, was to better understand how effective institutions and governments can moderate the increasing risks of future extreme weather events due to climate change. This research contributes to the body of evidence that institutions are an important foundation for climate adaptation, Tennant said.

There are many examples indicating that strong institutions—including government—play a critical role in protecting populations from adverse effects of natural disasters, Tennant said. But it is much more difficult to determine how universal this relationship is, she said, because there is so much variation in the frequency and severity of storms.

Natural hazards such as cyclones, the researcher wrote, result in disasters only when vulnerable human systems are exposed to hazardous conditions. In their analysis, Tennant and Gilmore explicitly accounted for hazard exposure, connecting the analysis of governance and other indicators of well-being to estimates of the severity and exposure to the tropical cyclone hazard.

They used several data sources to gather information about people, places, events and storms, including: the National Oceanic and Atmospheric Administration; the Centre for Research on the Epidemiology of Disasters Emergency Events Database; and World Governance Indicators.

"We developed an approach where we carefully modeled the extent of the storms to match them to the measures of governance and living conditions in affected areas," Tennant said. "This helps us to identify what makes people vulnerable."

Tennant first became interested in the intersections of disasters and development during her time as a Peace Corps volunteer in Honduras, where resources were constrained.

"I saw how a decade after the devastating Hurricane Mitch [1998], the disaster still affected the local communities and their well-being," Tennant said. "So what does disaster preparedness look like in a country where many people are without secure access to nutritional food and clean drinking water now? To what extent can investing in health, education and the quality of governments and institutions also serve as a useful foundation for disaster risk reduction activities?"

While the study does not suggest specific approaches to improving the quality and effectiveness of institutions, it does highlight their importance, Tennant said. "Ensuring that local institutions are involved

and accountable for the delivery of public services may have multiple benefits," she said, "including reducing deaths from natural [disasters](#)."

And while the researchers completed the study before the onset of the COVID-19 pandemic, the results are consistent with lessons emerging from the virus, Tennant said: "In our view, the pandemic has provided an immediate example of how government effectiveness plays an important role in shaping societal risks, regardless of a country's wealth."

**More information:** Elizabeth Tennant et al, Government effectiveness and institutions as determinants of tropical cyclone mortality, *Proceedings of the National Academy of Sciences* (2020). [DOI: 10.1073/pnas.2006213117](#)

Provided by Cornell University

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