

Introduction

Response to a disaster can be influenced by many factors, including distance, number of people affected, quality of weather forecasts, and amount of damage. One measure of the severity of a disaster is the number of deaths it causes. While this cannot affect the immediate response because it is not known until later, it does influence the continued response over the weeks and months of the aftermath, and the response to later, similar disasters. Deaths can be directly caused by the disaster (drownings, lightning strikes, trees falling on cars) or from indirect causes (patients on ventilators dying when hospitals lose electrical power, diseases caused by drinking unclean water).

For these reasons, it is important to get an accurate death toll. This can be difficult, as it is not always clear which deaths were caused by the disaster and which just happened to occur during or after it. For example, if a person dies of a heart attack during a storm, the attack may have been influenced by the stress of the situation, or the person might have had the heart attack even in good weather. Similarly, in the days and weeks after a disaster, more deaths may occur that would have occurred regardless, or that may be caused by lack of access to medical care caused by the disaster. Death tolls are often revised later as new information comes in.

In August 2017, Hurricane Harvey hit the Gulf Coast, especially Houston, Texas, and subsequent flooding caused extensive damage. The federal government's response to this disaster has been widely praised. It included positioning supplies nearby before the expected landfall, deploying National Guard and Coast Guard personnel to help, and approving a \$15 billion relief package to provide emergency shelters and loans to help people rebuild houses. The death toll from Hurricane Harvey has been reported as 107.

In September 2017, a series of hurricanes culminating in Hurricane Maria cut across the Caribbean Sea, causing extensive damage on many islands, including Puerto Rico. While many Caribbean islands are their own independent countries, Puerto Rico is a US territory, and Puerto Ricans are US citizens. Therefore, the US government was responsible for helping the people impacted by the hurricanes on Puerto Rico. However, some people feel that the US government did not respond appropriately in this case. It took several days for any help to arrive on the island. The death toll in Puerto Rico due to the hurricanes has been officially reported as 64.

At first glance, it may seem as though the larger response in Houston as opposed to Puerto Rico was justified, since the death toll, and therefore presumably the need, was higher in Houston. But what if the death tolls are not accurate?

The aftermath in Houston was widely covered by the media, and people were able to get outside the disaster area to hospitals to receive care or have deaths properly recorded. For these reasons, the death toll from Hurricane Harvey is likely to be accurate. But in Puerto Rico, the aftermath was not as well covered. With no electricity and no cell phones, it is difficult to know what might have happened. There was no way to get out of the disaster area without leaving the island. Many people might not have been able to get medical care, and many deaths might not have been properly recorded. For these reasons, the death toll from the hurricanes in Puerto Rico may not be accurate.

Some people set out to try to get a more accurate death toll in Puerto Rico. We will discuss one such study that got a lot of attention with headlines like "Hurricane Maria Death Toll May Be More Than 4,600 in Puerto Rico." That's a very different number from the official death toll of 64. How did they get to that number? Let's find out.