

When George Washington University (GWU) researchers published the details behind their estimate of 2,975 “excess deaths” in Puerto Rico due to 2017’s [Hurricane Maria](#), the work was [challenged](#) by US president Donald Trump.

In [two tweets](#) in September, he wrote: “They [the Puerto Rico government] hired GWU Research to tell them how many people had died in Puerto Rico (how would they not know this?). This method was never done for other hurricanes because other jurisdictions know how many people were killed.” The day before those tweets, he [claimed](#) that the reported rise in deaths was an attempt by “the Democrats ... to make me look as bad as possible”.

Setting aside the partisan politics, Trump’s objection seems to be that there is no list of 2,975 people killed directly and violently by Hurricane Maria. But that’s not what the GWU researchers set out to provide.

In June, we published [a historical review](#) of methods used to account for civilian war deaths. Similar confusion arises here as with natural disaster death “counts” and, indeed, our organizing framework cuts through exactly the confusion that hangs over the Hurricane Maria discussion.

Our review distinguishes between three forms of war-death accounting: documentation, counting and estimation.

Documentation usually involves listing deaths one by one, together with basic information about each death, such as the victim’s name, gender and age. A well-documented list provides some measure of dignity to the human beings whose lives have been irretrievably destroyed and their loved ones.

We restrict the term “counting” to, literally, counts of observed dead bodies – which is what has been taking place in Indonesia, following the earthquake and tsunami in October. The Indonesian death count currently stands at [2,073 and rising](#). Hopefully, this count will be developed into a well-documented list as the situation settles and investigations continue.

Finally, we come to estimates. These are based on statistical procedures that are performed on samples of a target population. We might, for example, conduct interviews with 2,000 randomly selected households in a former conflict zone. From our interviews, we might discover that 0.5% of our sample population was killed, and from that we infer that 0.5% of our target population met the same fate (plus or minus some error margin). This estimate cannot deliver a list of the actual people who were killed. Therefore, we should not describe such estimates as “body counts”, a term that misleadingly conjures up an image of counting up visible bodies one by one. Nevertheless, the three approaches link up effectively because when an estimate is good then it is theoretically possible to build a list of documented deaths with a count that is close to the estimate.

This linking principle is simply not possible when we estimate what are known as “excess deaths”, as the GWU team did for Puerto Rico. These are deaths that we assume would not have happened under an appropriately defined [counterfactual scenario](#); for example, if Hurricane Maria had never struck.

The purpose of an excess death estimate is to capture the possibility that people may die through indirect, non-violent channels in the aftermath of a violent event such as a hurricane. For instance,

health service disruption caused by Hurricane Maria might have increased the fraction of heart attack victims who die rather than survive.

But we cannot expect to match an excess deaths estimate with a list of specific victims; there will be [multiple causes of death](#) beyond just the hurricane for many candidates who might appear on such a list. For example, an old man may suffer a heart attack three weeks after Hurricane Maria. The heart attack may have happened regardless of the hurricane, but the man possibly missed his best chance to survive in part because the ambulance response time was slow, perhaps because of hurricane damage.

The absence of a body count to mirror an excess death estimate is par for the course and certainly not disqualifying, as President Trump seems to imply. We can debate the details of the GWU estimate but cannot dismiss it out of hand. And it is crucial that important differences between documentation, counting and estimation are articulated clearly whenever death “counts” are discussed.