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Ethical implications of probabilistic event attribution for policy discussions about loss and damage

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Warming of the global climate system is unequivocal, predominantly due to rising greenhouse gases with direct implications from rising mean global temperatures for some slow-onset events such as sea level rise, which can therefore be linked directly to past emissions. In many regions, however, extreme weather events, like heatwaves, floods, and droughts, are associated with greater loss and damage. An increase in average temperatures will lead to an increase in the frequency or magnitude of some extreme weather events including heat waves and droughts. For example, the deaths of at least thirty-five thousand people in Europe are attributable to the record-breaking heat wave of 2003. Extreme heat events and subsequent droughts can be directly linked to the loss of human life as well as damage to, or the significant diminishment of economic productivity.

Two points are crucial here. First, the science of attributing slow-onset phenomena, such as higher mean temperatures or rising sea levels, to greenhouse gas emissions and other anthropogenic climatic forcings is different than the science of attributing particular extreme weather events, such as heat waves and extreme precipitation, to anthropogenic global climate change. The latter requires a different statistical approach. Second, extreme weather events, at least in the short term, will cause more damage and thus adversely affect society more than slow-onset phenomena.

But while there is widespread agreement that slow-onset climate affects can be reliably attributed to anthropogenic greenhouse gas emissions our ability to attribute any particular extreme weather event to anthropogenic climate change is less accepted. However, with the emerging science of probabilistic event attribution it is possible to attribute the fraction of risk caused by anthropogenic climate change to particular weather events and their associated losses. Even with high uncertainty the robust link of a only a small fraction of excessive deaths in a heatwave to man-made climate change is from an ethical point of you very significant and we argue that this has widespread implications, e.g. for pending policy decisions concerning the Warsaw International Mechanism for Loss and Damage.