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A Case Study: Extreme Heat in Europe Summer 2022

Overview: During the summer of 2022, extreme heat in Europe caused excess deaths in the thousands and some of the hottest temperatures recorded. Vulnerable populations will continue to be at risk as heat waves are expected to increase due to anthropogenic climate change.

Facts: June to August 2020 in Europe was the hottest on record with temperatures around 40 degrees Celsius which is about 0.4 degrees Celsius above the previous summer of 2021.[1] A study by *Nature Medicine* estimated 62,862 of deaths were heat related during the summer of 2022 (defined as May 30 to September 4) which was 15% higher than the expected estimate. Women had a mortality rate 63% higher than men and the death rate increased with age, with 80+ years being the most at-risk population.[2] An estimated economic burden or cost is not available for 2022, however, the 2003 extreme heat wave across Europe was estimated to take a toll of 13 billion Euros.[3]

Epidemiological Aspects: Ballester et al. used data obtained from Eurostat on all-cause mortality in 35 European countries.[2] There were some differences in the data, such as data according to sex not being available in the UK, or only county level data being available in Germany. However, this was able to be accounted for in statistical analysis. First, regional temperature data was analyzed with the mortality data using quasi-Poisson regression models; then, models were used to account for lags and seasonal/long-term trends. multivariate, multilevel meta-regression analysis was then used for location specific findings and age and sex were also accounted for through the regressions used in order to evaluate demographic effects in mortality rates.[2] How the study defines “heat-related” can dramatically impact the estimated mortality rate, especially as heat can accelerate underlying cardiovascular or respiratory issues, so it can be more difficult to discern what the cause of mortality was. This study used regional temperatures to determine if deaths increased, which is appropriate but could also be over or underestimated depending on mortality in the regions. A research group that studied the same event found that less than half of the mortality rate, which shows the impact of how one defines variables like heat. They also note that heat-related deaths are related to the amount of underlying disease in the country.[4]

Management of the Event: This was not the first heat wave across Europe that caused excess death, making preparedness an issue. In 2003, a death toll estimated around 30,000 was caused by extremely high temperatures. Anthropogenic climate change, which has caused global warming of the earth, would mean that summers would become increasingly hot and that this disaster of 2003 should serve as a warning and reason to improve preparedness.[3] There has been a critique that the effectiveness of preparedness strategies is unknown, however, there are also steps, such as from the Red Cross Red Crescent Climate Centre, that indicate ways in which a city can use urban planning to improve public safety during extreme heat events.[5] On a global scale, following the climate change goals of the Paris Climate Agreement would help fall in line with the goal of reducing global temperature rise by 1.5 degrees Celsius below pre-industrial levels which includes shifting energy away from fossil fuels, among other strategies.[6]

These are all interventions that would lessen the extremity of heat in future summers. However, the management of the event as it occurs could also be improved. People were encouraged to check on others and could use air-conditioned schools open to the public.[7] There has been an acknowledgement that there are not adequate systems in place and no action plans on how to fix this. It is probable that the recent research showing just how many deaths were heat-related will increase the awareness and action into implementing secure adaptation plans.[8]

Communication of the event: This disaster affected many countries, so there was not one cohesive communication plan. However, countries like France attempted to inform the public and especially vulnerable populations on how to stay cool, to drink water, and avoid alcohol. I think social media could also be used to improve communication of public cooling centers and ways to say cool at-home.

Summary: Extreme heat across Europe in the summer of 2022 caused excess deaths — especially among vulnerable populations — and showcased the need for improved adaptation strategies for climate change related disasters for the countries that were impacted.

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