The impact of climate change on infant mortality in Viet Nam: identifying a need for higher quality accessible data

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Climate change represents an unprecedented threat to global health, disproportionately impacting low- and middle-income countries and vulnerable populations, especially children.[1] Extreme weather events have been linked to poor child health outcomes.[2] There is an urgent need for context-specific understanding of the complex relationship between climate change, socio-economic vulnerabilities, and the health and wellbeing of populations. Viet Nam is a low-middle income country with challenging geographical and climate factors, ranked as the country sixth most impacted by extreme weather events and climate vulnerability between 1999 and 2018.[3] We aimed to undertake a descriptive analysis based on publicly available climate and health data to explore the relationship between extreme weather events and the infant mortality rate (IMR) in Viet Nam.

Following a search for systematic population-level data on climate impacts at a provincial level, General Statistics Office (GSO) of Viet Nam data were selected for analysis. Publicly-available provincial-level data relating to climate change was not readily available, nor was publicly-available data on the severity and frequency of extreme weather events, despite a growing frequency as a consequence of climate change. Data on 'human losses due to natural disasters' at a provincial level was available via the GSO database, and this was utilised as a proxy to explore the relationship between extreme weather events and the IMR. Human losses to natural disasters include fatalities, missing persons, and injuries due to natural disasters as defined by GSO.[4] Whilst this definition is broad, it is known that the majority of human losses to natural disasters in Viet Nam are weather-related.[5] Univariable and multivariable linear regression was conducted using R (v4.3.1).

IMR was positively correlated with human losses to natural disasters and the percentage of people living in rural areas and was negatively correlated with the proportion of births attended by skilled birth attendants (Table 1) in the univariable models. In the multivariable model, when adjusting for cofactors including rurality, access to healthcare and poverty rate, the relationship between IMR and human losses to natural disasters was not apparent (Table 1). Given available evidence on the direct and indirect impacts of climate change and disasters on human health,[6,7] we believe our results reflect the limitations of current publicly-accessible data in identifying these relationships in Viet Nam rather than these relationships truly being absent.

There were several limitations of our analysis. The variable 'human losses to natural disasters' was used as a proxy for climate change in a setting where a more direct variable was not available. This limitation makes statistical model outputs difficult to interpret. The variable does not directly measure climate change itself, but a consequence of climate disasters, which represent only a subset of the consequences of climate change. Additionally, both human losses to natural disasters (exposure) and IMR (outcome) are both measures of mortality, which makes a true relationship between the data points difficult to interpret.

Publicly available data highlighting climate trends at a provincial level, such as temperature and precipitation, and specification of events, such as flooding or other natural disasters, are important policy relevant data points which were not available for our investigation. Given evidence of the impacts of climate change on health in Viet Nam,[7] we believe there is an urgent need to collect, and make publicly available, data to explore the relationship between climate change and health outcomes. This is especially true in geographically vulnerable regions, and population groups which are often neglected by mainstream research, such as those suffering from mental health disorders and children. Establishing a dedicated open digital platform with availability of standardised and spatially disaggregated demographic, health outcome and climate data would

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Variable	Univariable model—effect estimate (95% CI)	Multivariable model—effect estimate (95% CI)
Human losses to natural disasters	0.029 (0.011–0.048)	0.452 (–0.992 to 1.896)
Percentage of population that is rural	13.478 (4.124–22.831)	5.793 (–1.098 to 12.684)
Percentage of births attended by skilled birth attendant	–1.426 (–1.728 to –1.124)	–1.309 (–1.645 to –0.972)
Doctors per thousand	0.847 (–4.079 to 5.773)	0.229 (–2.965 to 3.423)
Poverty rate	0.205 (–0.056 to 0.466)	0.003 (–0.181 to 0.187)

Table 1: **Univariable and multivariable model outputs with infant mortality as outcome.**

enable further policy-relevant research. Collaboration between government, industry and academia should be encouraged, with data security measures integrated. For policymakers seeking to mitigate the impacts of climate change on human health, analysis of this data will be essential for formulating effective context-specific policies. Policy should consider the differential impact of climate change on vulnerable populations, including those in at risk geographical regions and populations which are overexposed to the risks of climate change.

This commentary seeks to contribute to the ongoing discourse on climate change and public health, and to spur further research, policy development, and action aimed at mitigating the adverse health impacts of climate change, particularly among vulnerable populations in climate-sensitive regions like Viet Nam. We call for policymakers to leverage improved data and evidence to forge a path toward a healthier, more resilient future for all.

Declaration of interests
Authors declare no conflict of interest.

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