



Contents lists available at ScienceDirect

Journal of Migration and Health

journal homepage: www.elsevier.com/locate/jmh

Connecting the dots: The triangle of migration, health and climate change

The growing and wide-ranging impacts of climate change are by now very well documented (Intergovernmental Panel on Climate Change (IPCC), 2022) and this includes a substantial and growing body of evidence around its effects on health (Romanello et al., 2022). The evidence is regularly updated to reflect emerging knowledge. We know that climate change-related health effects can be direct, including the 63% increase of heat-related deaths between 2000 and 2004 and 2017–2021 (Romanello et al., 2022). However, its effects are mostly indirect and often longer-term, spanning a wide range of areas through economic losses and worsening poverty (Marotzke et al., 2020) to the broadening geographical distribution of infectious disease vectors (Romanello et al., 2022).

Throughout history, internal and international migration can be contextualised as an ancient mitigation strategy for arising challenges. In this vein, migration can be viewed as societal response for moderating some of the worst health effects of climate change, though in some contexts, migration itself may worsen health outcomes (Abubakar et al., 2016). In addition, the nature of these movements may by definition be geographically unbalanced (migration out of environmentally vulnerable areas) this in turn may potentially create a new set of socioeconomic, health and perhaps even environmental issues (Kline, 2020). The terms “climate migrants” and “climate refugees” have been much popularised, although these concepts run the risk of being reductionist and not sufficiently reflecting the complexity of migration circumstances, decisions or trajectories, especially in relation to climate change (Marotzke et al., 2020).

Despite the growing body of evidence on the impacts of climate change on health, it is perhaps surprising that we know so little about the triangular relationship between health, migration, and climate change. The Intergovernmental Panel on Climate Change (IPCC) repeatedly reiterated how vulnerability and resilience to the effects of climate change vary significantly depending on geographic, socioeconomic and political dimensions (Intergovernmental Panel on Climate Change (IPCC), 2022). These non-linear relationships and interacting factors, which often can simultaneously act as outcome and exposure, make research in this triangle so challenging, rendering straightforward conclusions based on extrapolating available evidence simplistic and invalid. Evidence is also needed around planetary health (Whitmee et al., 2015), which highlights the myriad of interconnections between human health and global environmental change of which climate change is just an example – for example, biodiversity loss and land use change, of which human migration is both a driver and a consequence.

In this special edition, we present a collection of papers seeking to make progress on this topic: to improve the evidence on the nexus of migration, human health, climate change, and planetary health - the

drivers, impacts and responses, with specific attention to the needs of migrant populations. Through literature review, qualitative research, including interviews and case studies, authors seek to generate and expand conceptual models, summarise knowledge and outline research gaps, and make recommendations for future research and policy and practice (Issa et al., 2023; Khalid et al., 2023; Trummer et al., 2023).

Migration and migration health in specific settings affected by environmental change is also explored in this special issue. For example, Leviston et al. (2023) explores the effect of the loss of valued environmental attributes on migration intention in two studies using surveys and an “imagined loss” exercise in Perth, Australia. The research suggests that imagining environmental losses increases intentions to move and decreases place attachment. The interconnectedness of responses to environmental changes and perceptions of socio-cultural loss is highlighted, with variations depending on the type of valued characteristic imagined loss.

Additionally, Ismail et al. (2022) provides a unique snapshot into the burden of non-communicable diseases among forced Rohingya migrants in Cox’s Bazaar. The findings revealed a high prevalence of respiratory and gastrointestinal/hepatobiliary diseases, emphasising chronic obstructive pulmonary disease (COPD) as the most frequently observed. Accidental injuries, reported in 10.4% of cases, underscored the multifaceted health issues among this vulnerable population, calling for further exploration to inform comprehensive policymaking.

Based on three case studies in Bangladesh, Burkina Faso and Fiji, McMichael et al. (2023) seeks to illustrate the complexity of environmental change, migration and health. In this complex picture, it becomes apparent that migration brings opportunities and risks in health and other fields, for the migrants themselves as well as sending and receiving communities. Through the case studies in the selected countries, the authors employ qualitative methods to highlight diverse responses to climate-related displacement. They argue against simplistic categorizations like ‘climate migrant,’ emphasizing nuanced experiences influenced by socio-political contexts, healthcare access, and living conditions. The article underscores the importance of considering these factors to comprehend the varied health risks and opportunities associated with climate-related mobility.

Trummer et al.⁹ provide insights into the growing importance of climate change in Africa, where many livelihoods depend on agriculture and livestock. Based on a webinar involving 25 health and migration experts, the study reveals that climate change exacerbates forced migration, increases healthcare needs, and hampers access to healthcare. The research emphasizes mental health challenges linked to climate-induced migration, particularly affecting women and girls. It calls for a comprehensive approach, considering vulnerable groups,

<https://doi.org/10.1016/j.jmh.2023.100209>

Received 19 December 2023; Accepted 19 December 2023

Available online 20 December 2023

2666-6235/© 2023 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

specific health needs, and at-risk regions.

Issa et al⁷ contribute to the discourse with their work on the climate change, migration and health nexus. Their study identifies gaps and opportunities in research on the intersection of climate change, migration, and health. It underscores the need for clarity on interlinkages between these factors, extending the focus beyond traditional rural-urban migration and high-income countries. The study advocates for improved methodologies, ethical guidelines, and increased funding and collaboration.

Furthering the conceptualization of migration and climate change, Khalid et al⁸ propose a comprehensive conceptual model to understand the relationships between global climate change, migration, and health implications. Synthesizing key themes from literature and expert input, the model explores migrant populations at risk, health characteristics associated with migratory patterns, and the role of governance actors in addressing health issues related to migration.

The final contribution by Marcus et al. (2023), exploring climate change and the public health imperative for supporting migration as adaptation, argues that, in the era of global climate change, human mobility is a complex mix of forced and voluntary adaptation. Underlining that adaptive migration can save lives and improve health for vulnerable communities, the paper calls for active support from the public health community. It emphasizes the synergies between creating an enabling environment for migration and achieving key public health goals.

We know a lot about each dyad in the triangle of climate change, migration and health but we are only now starting to explore understanding of the entire triad. This special issue therefore sets the scene for the beginning of the journey to bring this triangle of health, migration and climate change conceptually together. Much remains to be done to start understanding lived experiences and perhaps quantifying these complex interactions and its effects.

CRedit authorship contribution statement

Dominik Zenner: Conceptualization, Writing – original draft, Writing – review & editing. **Renzo R. Guinto:** Writing – review & editing. **Helena Legido-Quigley:** Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Abubakar, I., Devakumar, D., Madise, N., Sammonds, P., Groce, N., Zimmerman, C., Aldridge, R.W., Clark, J., Horton, R., 2016. UCL-lancet commission on migration and health. *Lancet N. Am. Ed.* 388, 1141–1142.
- Intergovernmental Panel on Climate Change (IPCC). Climate Change 2022. Impacts, Adaptation and Vulnerability [Internet]. 2022 Available from: <https://www.ipcc.ch/report/ar6/wg2/about/how-to-cite-this-report>.
- Ismail, M., Hussain, M.F., Abdullah Al Hasan, M., Kamal, A.M., Rahman, M., Hasan, M.J., 2022. Health problems among forcibly displaced myanmar nationals (FDMNs) admitted to the medicine ward of Cox's bazar medical college hospital. *J. Migr. Health* 6, 100123.
- Issa, R., Sarsour, A., Cullip, T., Toma, S., Ruysen, I., Scheerens, C., 2023. Gaps and opportunities in the climate change, migration and health nexus: insights from a questionnaire based study of practitioners and researchers. *J. Migr. Health* 7, 100171.
- Khalid, A., Babry, J.A., Vearey, J., Zenner, D., 2023. Turning up the heat: a conceptual model for understanding the migration and health in the context of global climate change. *J. Migr. Health* 7, 100172.
- Kline, R., 2020. Where mitigation and migration meet. *Nat. Clim. Change* 10, 493–494.
- Leviston, Z., Dandy, J., Horwitz, P., Drake, D., 2023. Anticipating environmental losses: effects on place attachment and intentions to move. *Int. J. Geogr. Inf. Sci.* 7, 100152.
- Marcus, H., Hanna, L., Tait, P., Stone, S., Wannous, C., 2023. Climate change and the public health imperative for supporting migration as adaptation. *J. Migr. Health* 7, 100174.
- Marotzke, J., Semmann, D., Milinski, M., 2020. The economic interaction between climate change mitigation, climate migration and poverty. *Nat. Clim. Change* 10, 518–525.
- McMichael, C., Schwerdtle, P.N., Ayeb-Karlsson, S., 2023. Waiting for the wave, but missing the tide: case studies of climate-related (im)mobility and health. *J. Migr. Health* 7, 100147.
- Romanello, M., Napoli, C.D., Drummond, P., Green, C., Kennard, H., Lampard, P., Scamman, D., Arnell, N., Ayeb-Karlsson, S., Ford, L.B., Belesova, K., Bowen, K., Cai, W., Callaghan, M., Campbell-Lendrum, D., Chambers, J., van, Daalen K.R., Dalin, C., Dasandi, N., Dasgupta, S., Davies, M., Dominguez-Salas, P., Dubrow, R., Ebi, K.L., Eckelman, M., Ekins, P., Escobar, L.E., Georgeson, L., Graham, H., Gunther, S.H., et al., 2022. The 2022 report of the lancet countdown on health and climate change: health at the mercy of fossil fuels. *Lancet N. Am. Ed.* 400, 1619–1654.
- Trummer, U., Ali, T., Mosca, D., Mukuruva, B., Mwenyango, H., Novak-Zezula, S., 2023. Climate change aggravating migration and health issues in the African context: the views and direct experiences of a community of interest in the field. *J. Migr. Health* 7, 100151.
- Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A.G., Dias BF de, S., Ezeh, A., Frumkin, H., Gong, P., Head, P., Horton, R., Mace, G.M., Marten, R., Myers, S.S., Nishtar, S., Osofsky, S.A., Pattanayak, S.K., Pongsiri, M.J., Romanelli, C., Soucat, A., Vega, J., Yach, D., 2015. Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *Lancet N. Am. Ed.* 386, 1973–2028.

- Dominik Zenner^{a,*}, Renzo R. Guinto^b, Helena Legido-Quigley^c
^a *Clinical Reader, Wolfson Institute of Population Health, Queen Mary University London, United Kingdom*
^b *Associate Professor, Planetary and Global Health Program, St. Luke's Medical Center College of Medicine, Philippines*
^c *Chair in Health Systems Science, Imperial College London, United Kingdom*

* Corresponding author.
 E-mail address: d.zenner@qmul.ac.uk (D. Zenner).