

# Climate Change and its Impacts on Migration and Infectious Disease

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## Abstract

Human migration and population health, including infectious disease, will be significantly impacted by anthropogenic climate change. It will magnify and change migration paths, as well as contribute to changing infectious disease ecology and transmission dynamics. However, in the context of a changing environment, there has been little discussion of the linkages between migration and health. This article proposes that climate-change-related migration, when combined with other migration variables, will result in altered infectious disease profiles. It takes into account the hazards of infectious illness linked with various climate-related migration patterns, such as forced displacement, slow-onset migration, particularly to urban-poor areas, planned resettlement, and labour migration associated with climate-change adaptation activities. Migration can help people become less vulnerable to climate change, but it's also important to study and respond to the health effects of migration, especially infectious illnesses, on migrant populations and host communities.

**Keywords:** Environment • Climate change • Population • Migration • Disease

## Introduction

Much of human population migration has been an adaptive response to shifting environmental and climatic conditions throughout history. Globalisation and trade, innovations in travel and communication, transnational migrant networks, profound socio-economic disparities, skill shortages, demographic change, economic and political crises and conflicts, shifting capital, and the search for opportunities in work and education are all factors that shape contemporary migration. Many of these migration drivers will be amplified by climate change, which will produce new pressures that lead to individual, family, and community displacement and movement. With climate scientists now in agreement that anthropogenic climate change is occurring, more study, policy, and humanitarian attention is being directed on understanding the links between climate change and migration, as well as the human, societal, and political consequences. In the following decades, climate change is expected to contribute to significant increases in human population mobility [1]. Environmental changes, both slow-onset (e.g., sea-level rise, drought, and food insecurity) and fast-onset (e.g., climate change) are likely to cause migration (e.g., extremes of flooding, cyclones). Climate change's environmental and societal effects pose a variety of health dangers. With the possibility of increased human migration and mobility as a result of environmental changes, it's critical to comprehend the many health hazards and public health demands of individuals who are forcefully displaced or migrate. Climate change, human migration, and infectious disease are all discussed in this review, both now and in the future. First, it gives a quick rundown of the (hotly contested) links between climate change and population movement. The evidence for links between climate change-related human migration and infectious disease is then discussed in relation to various migratory responses, including forced displacement, slow-onset migration, especially to urban-poor areas, planned resettlement, and labour migration associated with climate change adaptation initiatives. Bangladesh, China, the Horn of Africa, and the Greater Mekong Subregion are used as examples in

this section (GMS). Because the migratory experiences and accompanying infectious illness consequences are not the result of climate change, some of these are examples-by-analogy [2]. These examples, however, serve as a proxy for understanding potential future health impacts of climate change-related migration, given the modest current amount of migration that is obviously attributed to climate change. The last section of the discussion looks at the implications for climate change adaptation planning and policy responses.

## Population shifts and climate change

The influence of human climate change on migration has become a major source of worry and discussion. Most frameworks, whether descriptive or analytical, begin by considering climate change as a driver of population mobility, as well as the possible numbers of individuals affected and migration patterns. Climate change is expected to increase population movement due to increased intensity and frequency of extreme weather events and climate-related disasters; loss of arable and habitable land, such as people who lose island habitats or coastal or riverine terrestrial land due to sea-level rise; and negative impacts on ecosystems that are important sources of amenity and livelihood, such as land degradation, declining fish abundance, and river bank erosion. Climate change will have a wide range of effects, from "forced" to "voluntary" migration, short- to long-distance travel, and permanent, circular, seasonal, and short-term mobility. Climate change, on the other hand, rarely works alone; it is often one of several factors that collide to produce migration. Social, demographic, political, and economic stressors, such as high population density, limited economic opportunity and employment, inequitable distribution of resources and services, and armed conflict, will coexist with climate risks and influence migration decisions in less developed countries in particular. Environmentally-related migration is viewed in a more nuanced light, taking into account human capacity to adapt to changes in the environment, major impediments to migration for many affected people, and the sensitivity of current migratory flows to the added influence of climate change. Economic resources, social and human capital, and the availability of places and livelihoods all help people migrate. However, poorer and more vulnerable people may be less able to relocate in reaction to environmental disasters and deterioration. Climate change will also have an indirect impact on migration movements, such as labour migration and displacement as a result of climate change adaptation infrastructure activities [3].

Migration and infectious disease as a result of climate change to date, the evidence and public debate on the implications of climate change have primarily focused on the natural and built environments. On a human scale, however, there are serious consequences, including negative effects on population health and migration. Health concerns have been linked to temperature variations and extremes, climate-related natural disasters, altered food yield and water supply, and altering infectious disease patterns, according to epidemiological research. These findings indicate that the core environmental support systems for biological health and human security are weakening or depleting. However, the health consequences of climate change arising from indirect causal pathways (those mediated by social, political, and economic variables), such as the health consequences of climate-related migration and displacement, have gotten little attention. Migration, if well-managed, could provide an adaptive response that mitigates the negative health effects of climate change. Some migrants may have better access to health care facilities, healthier diets, cleaner environments, health-promoting economic benefits, and improved chances for social mobility in settlement sites than they did in their home countries. Furthermore, because migrants generally have the resources and capacity to travel, migrants can be healthier than host populations in many situations (i.e., the 'healthy migrant effect') [4]. However, the difficulties associated with migration processes (pre-departure, transit/travel, post-migration, return visits), the vulnerabilities of certain migrant groups (e.g., irregular migrants, those from impoverished areas, forcibly displaced populations), and social-cultural structural constraints in host countries all contribute to poor health outcomes for many migrants. Urban migration connected to climate change and socioeconomic issues has been linked to a reduction in human development indicators and increasing stress on local health facilities in low lying a toll nations in the Pacific area, such as the Republic of Kiribati and Tuvalu. People who were forcibly displaced as a result of events related (cautiously) to climate change, such as Hurricane Katrina and the Darfur conflict, have had negative health repercussions. Migration has an impact on the likelihood of contracting an

infectious disease [5]. Migrating persons are exposed to infection in new places, serve as carriers of illness during transit and to their new places of residency, or reintroduce infectious agents during return migration, which changes the distribution and prevalence of infectious disease. Prior levels of immunity to specific infectious diseases in a community are a key moderator of risk for both migrating and host populations. Migrants may be exposed to endemic diseases for which they have inadequate resistance or sociocultural experience as a result of climate-related migration. People moving through or into areas with high malaria endemicity, for example, are particularly vulnerable to infection. Migrants, on the other hand, may carry infections such as tuberculosis (TB), hepatitis B, and sexually transmitted infections (STIs) with them, which can subsequently spread among the host population. Infectious illness risks are also influenced by social variables like as employment and living situations, as well as health habits in settlement areas, such as migrants' access to health care [6]. Infectious illness concerns related with broad migration dynamics that are expected to grow as a result of climate change are discussed in the subsections below. These subsections do not give a thorough review of all infectious disease concerns; rather, they highlight the potential link between climate-related migration and infectious disease by relying on parallel examples from other migration-health research. Climate change can also present infectious disease risks for immobile populations who lack the resources to move: for example, those left behind after an environmental disaster may face risks due to the disaster's impact on disease vectors, water and sanitation systems, shelter, and public health infrastructure and services, which are not discussed in depth here. Migration and infectious disease as a result of climate change. To date, the evidence and public debate on the implications of climate change have primarily focused on the natural and built environments. On a human scale, however, there are serious consequences, including negative effects on population health and migration [7]. Health hazards have been linked to temperature differences and extremes, climate-related natural disasters, altered food yield and water supply, and altering infectious disease patterns, according to epidemiological research. These findings indicate that the core environmental support systems for biological health and human security are weakening or depleting. However, the health consequences of climate change arising through indirect causal pathways (i.e., those mediated by social, political, and economic variables), such as the health consequences of climate-related migration and displacement, have received little attention. Migration that is well-managed may provide an adaptive response that decreases the negative health effects of climate change. Some migrants may have better access to health care facilities, healthier diets, cleaner environments, health-promoting economic benefits, and improved chances for social mobility in settlement sites than they did in their home countries. Furthermore, because migrants often have the resources and capacity to travel, they can be healthier than host populations in many situations (i.e., the 'healthy migrant effect'). However, the difficulties associated with migration processes (pre-departure, transit/travel, post-migration, re-entry visits), the vulnerabilities of specific migrant groups (e.g., irregular migrants, those from impoverished areas, forcibly displaced populations), and social-cultural structural constraints in host countries all contribute to poor health outcomes for many migrants [8]. For example, urban migration connected to climate change and socioeconomic issues has been linked to a reduction in human development indicators and greater stress on local health facilities in two Pacific island nations, The Republic of Kiribati and Tuvalu. and people forcefully displaced as a result of events attributed (cautiously) to climate change, such as Hurricane Katrina and the Darfur conflict— have suffered negative health effects. Migration has an impact on the likelihood of contracting an infectious disease. Migrating persons are exposed to infection in new places, serve as carriers of illness during transit and to their new places of residency, or reintroduce infectious agents during return migration, which changes the distribution and prevalence of infectious disease. Prior levels of immunity to specific infectious diseases in a community are a key moderator of risk for both migrating and host populations [9]. Migrants may be exposed to endemic diseases for which they have inadequate resistance or sociocultural experience as a result of climate-related migration. People moving through or into areas with high malaria endemicity, for example, are particularly vulnerable to infection. Migrants, on the other hand, may carry viruses including tuberculosis (TB), hepatitis B, and Sexually Transmissible Infections (STIs) with them, which can subsequently spread among the host population. Infectious illness risks are also influenced by social variables like as employment and living situations, as well as health habits in settlement areas, such as migrants' access to health care. Infectious illness concerns related with broad migration dynamics that are expected to grow as a result of climate change are discussed in the subsections below. These subsections do not provide a thorough review of all infectious disease concerns; rather, they highlight to the potential association between climate-related migration and infectious disease by drawing on analogous cases from the

larger migration health literature. Climate change can also present infectious disease risks for immobile populations who lack the resources to move: for example, those left behind following an environmental disaster may face risks due to the disaster's impact on disease vectors, water and sanitation systems, shelter, and public health infrastructure and services, which are not discussed in depth here [10].

## Conclusion

In the future decades, climate change will have a profound impact on the scale and type of migration. Migration is increasingly understood as an adaptive response to the effects of climate change, rather than a crisis to be contained. According to the UK Government's Foresight research on migration and global environmental change, environmental migration will present both opportunities and challenges. At national, regional, and international levels, the 2010 Cancun Adaptation Framework calls for "steps to promote knowledge, coordination, and collaboration with regard to climate change related displacement, migration, and planned relocation, where appropriate. In the face of environmental change and accompanying vulnerability, migration may be an efficient option for people to strengthen their resilience and diversify their incomes. However, during migration processes and in relocation or settlement sites, the health of migrants and host communities can be jeopardised. Indeed, the 2008 World Health Assembly (WHA) and the 2010 Global Consultation on Migrant Health both focused on migrants' health vulnerabilities. Migration patterns and contexts shaped by climate change will have different effects on health outcomes, particularly infectious disease, among migrants and host populations. It is necessary to better understand and respond to the health implications of migratory populations and host communities in order to support mobility as an adaptive response to climate change. Migration will be most effective as a climate change adaptation strategy when it occurs in supportive social and political contexts, which necessitate health systems, resources, policies, and programmes that address migrant populations' health vulnerabilities and needs. Climate change migration health relationships are complex (social, political, economic, and environmental). Population health responses – research, policy advice, and practise must take a multidisciplinary and multi-sectorial approach to address the complexity (social, political, economic, and environmental). Local resilience should be built through climate-sensitive development policies that reduce the need to migrate away from adversely impacted areas, protect the rights and well-being of individuals who face mobility restrictions, and support migration's adaptive capacity. International policymaking, patterns of production and consumption, ecosystems, economics, human and environmental research, and ethics are all affected by climate change. Climate change-related migration, as well as the risk of infectious disease and other health consequences, must be better understood and addressed by the international community.

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