The Climate Migrant: Health Risks Before, During, and After Migration

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ABSTRACT
The climate crisis and migrant health are closely intertwined. Climate change is rapidly altering the planet, and migrants are experiencing new and overlapping health consequences as a result. In this article, three subsets of migrants affected by the climate crisis are identified, and the health needs of each are delineated. Climate-precipitated migrants were forced to move as a result of a climate impact like a hurricane or drought. Climate-impacted migrants may have migrated initially for reasons unrelated to the climate crisis, but the social and occupational factors they encounter increase their risk of climate-related health effects during and after migration. Climate workers, the third type of migrant identified, move into regions affected by climate disasters to aid in clean-up and rebuilding, facing significant occupational and environmental health risks. All three types of climate migrants are increasing, but little attention is given to the health and safety of these migrants. Frontline clinicians and community health centers play an increasingly important role regarding climate-related health conditions; up-to-date training of and support for clinicians can reduce climate-related morbidity and mortality, but clinicians on their own are unprepared to systematically address climate health inequity. Regulation needs to anticipate the health impacts of the advancing climate crisis by reinforcing the migration system to enable movement after a crisis and increasing worker protections to facilitate faster and safer climate response and post-disaster recovery.

Keywords: *Migrants, immigrants, immigrant health, migrant health, migrant workers, farmworkers, climate change, climate justice, occupational health, disaster response*

1. Introduction

Human activities have already increased global surface temperatures 1.1 degrees Celsius above 1850 - 1900 levels.[1] 2023 was the hottest year on record,[2] emissions of greenhouse gases like carbon dioxide continue to increase rather than decline, and crossing the threshold of 1.5 degrees of warming, the international target to reduce the worst effects of climate change, appears to many as 'inevitable'.[3] This global warming has created a climate crisis wherein global and regional climate and weather patterns have been altered, changes which are predicted to continue and rapidly intensify. Sudden-onset climate disasters like hurricanes and wildfires, and slow-onset climate disasters like drought, are destabilizing communities across the world. These disasters are causing new migration as well as putting new pressures on people who are already migrating or have recently migrated.

Migration, both within countries and across borders, is growing. As migration and the climate crisis intersect, hundreds of millions of people are experiencing new health risks and changes in health status that require significant attention and new public health and regulatory approaches. Yet, the climate crisis can affect the health of migrants in different ways -- before, during, and after their migration. In this article, we identify three subsets of migrants who are affected directly by the climate crisis at different stages of their migration process, with an emphasis on these migrant populations who are moving to or within the United States. Climate-precipitated migrants were forced to move as a result of a climate impact like a hurricane or drought. Climate-impacted migrants may have migrated initially for reasons unrelated to the climate crisis, but the social and occupational factors they encounter increase their risk of climate-related health effects during and after migration. Climate

workers, the third type of migrant identified, move into regions affected by climate disasters to aid in clean-up and rebuilding, facing significant occupational and environmental health risks. A migrant can fall into more than one category; indeed, as the climate crisis worsens, migrants may experience health consequences from the climate crisis at each step of their migration, and one migrant may be categorized within all three subsets of climate migrants.

2. Climate-Precipitated Migrants

The climate-precipitated migrant leaves their home because of a destabilizing climate impact. Some migrants are propelled to voluntarily move as an adaptive strategy, as a response to climate-heightened vulnerabilities. For example, a subsistence farmer who is economically precarious may decide to move after an unprecedented climate-intensified drought; the farmer may already have experienced numerous challenges threatening his livelihood, including the impacts of economic downturns as a result of COVID-19, community gang violence, unstable supply chains, structural inequities, and political corruption and instability,[4-5] but the drought was the precipitating factor that finally propelled him to move. In other cases, a climate-precipitated migrant is forced to urgently move for survival. For example, in 2020, two Category 4 hurricanes, Eta and Iota, destroyed an estimated 700,000 hectares of crops and displaced 339,000 people in Guatemala alone, destabilizing entire communities.[6] These hurricanes, with their rapid intensification and deceleration ahead of landfall, "bore the hallmarks of climate-driven storms."[7] Across the region, an estimated 1.5 million Central Americans were displaced that year alone, and humanitarian response was slow, as the pandemic restricted movement, leaving displaced people with minimal access to aid relief.[8-9]

The health consequences of the climate crisis for climate-precipitated migrants are varied and extensive. An estimated 94 people died during or directly following the hurricanes.[10] The longer-term impact may kill many more. Central America's multi-year severe drought, followed by Eta and Iota, compounded by numerous other destabilizing factors, has caused widespread malnutrition that continues to affect the displaced, many of whom chose not to, or were unable to, return home.[11] Without access to stable, safe housing, clean water, food, or employment, the displaced face a wide range of health impacts, from pneumonia, to water-borne illness, to heat-related illness, infectious disease, and death. It is estimated that more than 7 percent of the population of certain regions of Honduras and Guatemala have been recorded at the US-Mexico border as migrant families; accurate migration percentages are very likely to be higher, with many migrants settling in other areas of their country or in neighboring countries.[12]

Within the US, 1,150 disasters resulted in 11.1 million internally displaced people (IDPs) between 2008 and 2022, not including IDPs from US territories like Puerto Rico and the Virgin Islands.[13] While earthquakes accounted for a small percentage of these displacements, the vast majority were the result of storms, floods, and wildfire, many of which have been strengthened by the climate crisis. Many hope to stay at their new locations; others intend to return to their homes when their region becomes safe and stable again.

Underreporting and poor data systems capable of capturing climate-related displacement result in incomplete data on the picture of climate-precipitated migration across the Americas. Yet, the incidence of climate migration is expected to accelerate. Climate disasters are expected to force between 216 million to over 1 billion people to move globally by 2050.[14-15]

3. Climate-Impacted Migrants

The overlapping and amplifying forces that result in migration often include some aspects of the climate crisis, as discussed above. However, at the US-Mexico border, climate impacts are not recognized in US asylum law.[16] Asylum seekers must prove a credible fear of persecution to be eligible for asylum.[17] Consequently, migrants who have received asylum in the US have documented persecution due to race, religion, nationality, membership in a particular social group, or political opinion. Their lived experiences include threats from local gangs or cartels, domestic partners, and political factions. It is important to recognize that the climate crisis is not reported

as the primary instigator of migration by most migrants today; however, as a "threat multiplier," as it is often termed, climate change intensifies and exacerbates pre-existing insecurities and instabilities.[18]

Regardless of the size of the role that the climate crisis had on a migrant's decision to move, all migrants experience heightened vulnerabilities that can result in climate-related health impacts during and after their migration. In this article, migrants experiencing this intra- and post-migration climate impact are called climate-impacted migrants (CIMs). Under this definition, all climate-precipitated migrants become climate-impacted migrants when they begin their migration and encounter these new climate-related health threats.

During migration, CIMs encounter climate-fueled weather patterns that can disrupt their health and lead to death. Common health risks from these weather patterns include dehydration, heat or cold stress, exposure to elements, and overcrowding in shelters. Poor access to food, clean water, shelter, health care, and other necessities are common among CIMs. At the US-Mexico border, some enter with visas or request asylum. Many others attempt to cross the border in remote locations to enter the US. During this portion of their migration, CIMs have encountered climate extremes like heat, drought, and flash flooding. The remains of 9,515 migrants were recovered by Customs and Border Protection (CBP) between 1998 and 2022.[19]At least 890 migrant remains were found in 2022 alone. Deaths in 2023 may have been even higher, with 148 deaths during the fiscal year in just the El Paso sector, nearly double of FY 2022's number.[20] The International Organization for Migration has declared the border the deadliest land route for migrants worldwide.[21] The increase in deaths may relate to the unprecedented intense and long-lasting heat waves the region experienced in the summer of 2023.[22] The scale of the issue is not new, however; the American Public Health Association declared these deaths a public health crisis in 2009.[23]

Climate factors during and after migration have a higher impact on CIMs compared to the US population as a whole because migration itself positions CIMs for poor health outcomes. During migration, CIMs have an increased risk of a myriad of health concerns because of migration: exposure to infectious disease from crowded migrant facilities, substandard housing, or unsafe water; food insecurity and scarcity; and mental health needs from trauma, stress, exploitation, and unsafe encounters during migration. Access to health care when needed is largely blocked for migrants. Lack of familiarity with local health care services and systems, limited eligibility to publicly and privately funded health care programs, lack of transportation, limited funds for out-of-pocket costs, fear of exposing immigration status, language differences, and cultural differences each may erect a barrier to establishing care when needed. Even IDPs, who often do not encounter barriers around language, culture, and familiarity with health systems, may be unable to access care in their new location, when their current insurance will not cover out-of-network care, and local health systems require proof of residency to be eligible for the new state's health insurance.

Following migration, many CIMs are limited to the industries in which they can find work, and take jobs in industries such as agriculture and construction. These two industries are already some of the most dangerous industries in the country,[24] and are additionally highly impacted by the changing climate. While data are limited due to migration and fear of exposing immigration status, it is estimated that 68% of hired farmworkers are foreign-born, primarily from Mexico and Central America.[25]

Due to the outdoor nature of these jobs, climate is a key risk factor, particularly extreme heat and wildfires. Here, we outline some of the climate health risks faced by CIMs after migration when working in climate-impacted industries.

Heat

Extended heat waves can result in dehydration, heat stress, and death when temperatures are high. High heat also causes numerous secondary health risks, such as long-term kidney damage and kidney disease, worsening of comorbidities, prescription interactions, and mental health impacts.[26] Farmworkers are 35 times more likely than other workers to die on the job due to heat; construction workers are 13 times more likely.[27]

Housing
Workplace-provided housing, commonly extended to low-wage workers like farmworkers, is often substandard. Among those who must secure their own houses, poor finances, lack of social networks, and rural locations may limit workers' ability to find suitable housing. Substandard housing is hazardous in a climate-altered world. During an extended heat wave, for example, poorly constructed and overcrowded houses with poor ventilation and/or insulation expose workers to high-heat conditions indoors after work, thereby increasing their risk of heat stress and dehydration compared to workers who can recover overnight in a cooled home. Similarly, during a wildfire, workers in substandard housing are exposed to wildfire smoke inside, without reprieve.

Water
Farmworkers in rural areas often rely on well water; after floods and storms, or during extended drought or heat, water contamination may be a concern, from chemical and fuel spills, deceased animals, rotting materials, and growth of bacteria or algae.

Air quality
Wildfires are another climate-fueled disaster that disproportionately affect outdoor workers like those in farmwork and construction, where heavy physical exertion outdoors is required, and their vulnerabilities are compounded. Fires cause acute burns, and smoke can affect the cardiovascular and pulmonary health of people hundreds of miles away. When a smoke event occurs, workers in many situations continue to labor, without consideration for or understanding of the considerable acute and chronic impacts of smoke inhalation. Other day-to-day exposures – including high heat, pesticides, and ozone – may overlap with smoke exposure, and the composition of wildfire smoke may include farm and home chemicals and/or heavy metals like lead.[28]

4. Climate Workers

As climate change has progressed, a new category of migrant workers has emerged: the climate worker. These workers take jobs directly related to climate disasters. Called "resilience workers," "disaster clean-up workers," or "reconstruction workers," these low-wage temporary workers move into regions that have experienced a disaster. As climate change has increased the number and severity of disasters, this work has become more regular, and some workers have moved from one disaster region to another, while others moved into a region as a resilience worker and settled. Their work includes demolition, removal, and remodel/reconstruction of damaged structures, and clearing and repair of roadways and infrastructure that may be inaccessible from debris like water, mud, and downed trees. Additionally, in wildfire areas in the West, some migrant workers are training to assist in seasonal prescribed burns to reduce the impact of future fires.

Despite the wide range of work they may be conducting, climate workers share many social factors that can affect their health: their work is insufficiently regulated, they have few economic resources, they often do not speak the dominant language, lack networks in their temporary communities, lack familiarity with health systems, and, for many, lack authorization to work. Those without work authorization harbor fear of exposure and reluctant to access forms of assistance. Layered on these notable social factors, climate workers also experience health risks at work. Climate workers have the same environmental and occupational health risks that CIM workers like farmworkers and construction workers do, as delineated above, as well as additional risks unique to their work in a post-disaster environment. Some areas of concern are:

Housing

Just like farmworkers, climate workers are sometimes provided housing and bussed into the region to work. The provided housing frequently is substandard, but alternatives are unavailable in recently-devastated areas. Those living in housing within disaster zones contend with issues like mold, structural integrity, and poor security.

Food and water

Post-disaster regions often lack important basic infrastructure, and workers frequently do not have access to clean potable cool water at work nor in worker housing. Establishments selling food may be limited as businesses themselves are shuttered by the disaster.

Exposures

Exposure to mold and mildew is common when working in buildings after flooding and storms, causing significant health concerns. Carbon monoxide deaths spike when demolition workers or those living in communities after a disaster improperly utilize generators indoors for basic electrical needs or for reconstruction.

Climate workers' health is not at risk solely from a disaster that has occurred. The regions in which they work have a high probability of a recurring climate event, and workers who move into a post-disaster landscape can become displaced by another disaster. For example, climate workers who rushed to Florida to assist with urgent cleanup after Hurricane Ian, a deadly Category 5 hurricane, were exposed to Hurricane Nicole, which arrived six weeks after Ian.[29] This situation is a reminder that a migrant may shift from one subset of climate migrant to another, in this case, from climate worker to CIM.

5. Legislative and regulatory deficits

Compounding these numerous health risks for migrants, which themselves are amplified by a litany of social factors, is a severe lack of federal and state regulatory protection for the jobs that migrants can take.[30] For example, farmworker exceptionalism is a long-standing policy of exclusion of workers in agriculture from basic labor laws and protections, like overtime pay and the right to unionize, from which most other types of workers benefit. Moreover, farmworkers are excluded from health and safety regulations afforded to other workers.[31] There are no federal standards to protect workers from heat or wildfires. To date only five states have promulgated heat standards for outdoor workers. Washington, California, and Oregon are currently the only states that regulate occupational exposure to wildfire smoke. While numerous laws regulate the construction industry, the urgency and impermanence of post-disaster cleanup work often result in an environment where regulatory protections are ignored or overlooked.[32] Climate migrants enter into a work arena where they receive minimal protection and do not have access to training on work hazards in the language of their choice, including trainings relating to the workplace (like fall prevention) and those related to climate (like heat stress avoidance, or the health implications and best practices around mold and mildew, or wildfire smoke).

6. Discussion: Policy-based and clinical pathways to support climate migrants

Some of the significant migrant health challenges arising from the climate crisis can be lessened through climate-informed emergency preparedness policy and climate-strengthened health systems, particularly the community health center model.

Legislative and policy efforts on emergency preparedness can recognize and anticipate migrant health vulnerabilities. Here are some avenues:

a) Communities should review and reframe present emergency plans to factor in climate risks. Many emergency preparedness efforts, at the local, county, state, and federal levels, do not take into account the breadth and severity of climate impacts that may occur. Some communities are experiencing new climate impacts, like wildfires, in places that had not historically encountered fires, or higher sea levels impacting coastal communities. Other communities are seeing intensified disasters like rainstorms. In Puerto Rico, an island that has historically sustained hurricanes, climate-strengthened hurricanes are causing greater damage and death because of greater precipitation, a consequence of climate change.[33] Policies must review and reflect present-day and future climate-fueled emergency situations.

b) Vulnerable populations like migrants must be incorporated into emergency policy, legislation, and programs, with culturally responsive and linguistically appropriate information and outreach. Anecdotal

reports across the nation – from fires in California to storms in North Carolina -- show migrants and immigrants unaware of emergencies or evacuation events because of a lack of community connection and, notably, a dearth of Spanish-language emergency information. [34-35]As these communities are often the most at-risk, they need to be identified and consulted, and their specific needs and outreach to meet them should be incorporated into emergency plans.

c) Policy and legislative initiatives around resiliency need to work with social structures and address the root cause of hazards in communities. For example, funding for community renewable energy is an important step toward local energy independence and control during an emergency. However, those who are more vulnerable often do not qualify for these programs given unsafe or unstable housing. Resiliency strategies need to target structural deficiencies first, and climate technology later.

Finally, national policy and emergency plans should incorporate and fund community-led responses from community health centers (CHCs). CHCs are on the frontlines of the climate crisis, and they are uniquely positioned to support the health of climate migrants at each step of their migration. The federally supported CHC system comprises of roughly 1,400 organizations in every state, U.S. territory, and the District of Columbia.[36] CHCs, also called Federally Qualified Health Centers (FQHCs), offer affordable health care to over 30.5 million people. Their model provides care regardless of immigration status and ability to pay, and increases access by reducing barriers like cost, lack of insurance, geographic accessibility, and language access.

CHCs are community-based, and well-versed in the needs of their communities. Indeed, in disaster after disaster, CHCs are on the frontlines, as a trusted source of care, connection, and relief to their communities, even in the face of significant impediments like damaged infrastructure and lack of consistent electricity.[37] However, it is not standard practice to consider these organizations when crafting national response plans. In addition to capacity building, federal funding and plans must include CHCs and community organizations that can promote recognition of and resiliency and adaptation among the most vulnerable.

As climate change increases vulnerabilities, these CHCs can partner with community leaders and organizations to develop emergency plans that incorporate the voices and needs of migrants. CHCs must also consider their physical infrastructure, incorporating solar and back-up battery systems to ensure consistent operations during emergencies. Many CHCs have already partnered to build “resilience hubs” – community-led equity-focused centers that can serve as community gathering spaces and trusted locations in the case of an emergency.[38] A resilience hub offers refuge in an emergency, but also can provide services and education, from emergency meal distribution to children’s mental health support, to employment assistance.

Clinicians, including community health workers, need ongoing education, technical assistance and culturally contextual resources and strategies to meet the growing and changing needs of the migrant populations that visit or resettle in their communities. Additionally, in the face of climate disaster, clinicians themselves need support. The mental health toll of caring for an underserved and overlooked community in the midst of crisis is significant and long lasting. Moreover, the clinicians and their families themselves may by impacted by the disaster, furthering the mental health toll. Migrant Clinicians Network, a nonprofit focused on building practical solutions at the intersection of migration, vulnerability, and health, meets clinicians’ clinical training needs, providing resources, virtual seminars offering continuing education credit, technical assistance, peer support and connection, and virtual case management specifically designed for clinicians serving migrants. As the climate crisis continues to disproportionally affect migrants, this organization and its partners are emphasizing climate-focused programming, continuing education, and culturally contextual resources to better address the health needs of climate migrants.

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