Impact of climate change on vulnerable populations

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Vulnerability can be defined as a more significant potential exposure, or a greater susceptibility, to climate hazards. All of humanity is vulnerable to the effects of environmental change but some individuals and populations are more vulnerable to climate-induced adverse health effects than others by virtue of their personal or societal risk factors.

HOW DOES CLIMATE CHANGE AFFECT VULNERABLE POPULATIONS?

Greenhouse gas emissions and carbon sink destruction are altering the earth's atmosphere. This is leading to the generation of climate hazards such as decreased air quality, reduced food and water quality and security, extreme weather and drought. Climate change is also associated with increasing exposure to pollutants and to decreasing biodiversity. These hazards can affect many aspects of physical and mental health including digestive health and diseases.[1]

Vulnerability factors amplify the health risk of climate hazards. They include geographical, socioeconomic, sociopolitical, biological and demographic variables (figure 1).[2] These factors are not causative but can act as covariables in amplifying risk. For example, about half of the world's 8 billion people live in regions that are highly exposed to the risk of climate change including flooding events, drought and rise in sea level.[3] Unfortunately, those most likely to be affected with climate event related challenges are often those who reside in low-income countries. These countries usually have a large population of children and have limited ability to adapt to the challenges of climate change, or to recover from climate events.

MIGRATION

Climate-related events can force people to migrate from their homes or regions and create a highly vulnerable population. Migration can be temporary or permanent, internal within the country or international between countries. It may be voluntary, or involuntary, and secondary to slow onset or acute events. Some reports suggest that by 2050 climate change will displace internally (within their countries) as many as 143 million people in

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sub-Saharan Africa, South Asia and Latin America alone.[4] The health needs of migrants are complex.[5] Many voluntary migrants move under stable and planned conditions and migration may reduce their vulnerability, but forced or involuntary climate migrants face many challenges that affect their health and well-being. Some refugees and migrants may face worse health outcomes as a result of difficulty in accessing care in countries of transit and destination. Barriers to care access include language and cultural differences, institutional discrimination, and restricted use and availability of health services in the countries migrants are travelling through.[6 7] Other groups at increased risk are those who, by virtue of their personal or national circumstances, are unable to migrate. Children, the elderly and the ill may be left behind as younger members of a family or community leave. Access to continuing care is important since some refugees and migrants may have an increased risk of infectious diseases[8] and other chronic illnesses including liver and intestinal diseases. Functional gastrointestinal disorders (FGIDs) are associated with stress, anxiety and depression. Many migrants experience mental health challenges including post-traumatic stress disorder (31.4%), depression (31.5%), anxiety disorders (11%) and psychosis (1.5%).[9] FGIDs may be more prevalent among refugees and migrants. Climate migration may contribute to conflict as displaced populations compete for resources[10] and, in a vicious circle, conflict may contribute to displacement.

OVERVIEW OF VULNERABLE POPULATIONS

Many of the individuals and populations who are at the most risk of climate hazards may not be able to alter their circumstances or risk factors. A societal or system response is required. One objective might be to build resilience in health facilities to climate threats, a process that starts by performing a vulnerability and adaptation assessment. Preferably, this is done from a national perspective but in many countries that is not possible, in which case assessments can be done on a health facility scale.

The steps required in the building of climate resilient systems involve the planning of the vulnerability assessment, performing a vulnerability and capacity assessment, developing a model of future risk assessment, adaptation assessment and synthesis of the assessment into relevant climate change health policies and plans.[2] Reducing the vulnerability of health hazards for involuntary migrants is even more complex as migrants may move through multiple jurisdictions on their journey to their destination.[11]

Children are especially vulnerable, and nutrition is one of the key factors that drives that vulnerability. Unfortunately, the state of the world's nutrition is getting worse due to several factors including postpandemic inflation, supply constraints and conflict. The UN Food and Agriculture Organization food security map confirms this with many areas of the world showing high degrees of food insecurity with most impacted countries being lower income.[12] Climate change worsens this pattern of food insecurity in several ways including driving up commodity prices. The problem of food insecurity is not confined to low-income countries. For example, in the UK, 9.3 million adults (of UK's 67 million population) reported food insecurity in January 2023 and 3.2 million reported not eating for a whole day because they could not afford or access food.[13]

The climate crisis continues to evolve and may accelerate as tipping points are reached. Tipping points with feedback loops may be triggered at 1.5°C, a level of warming previously considered safe.[14] Despite rising concern and engagement from the medical community, as documented in the Lancet countdown reports,

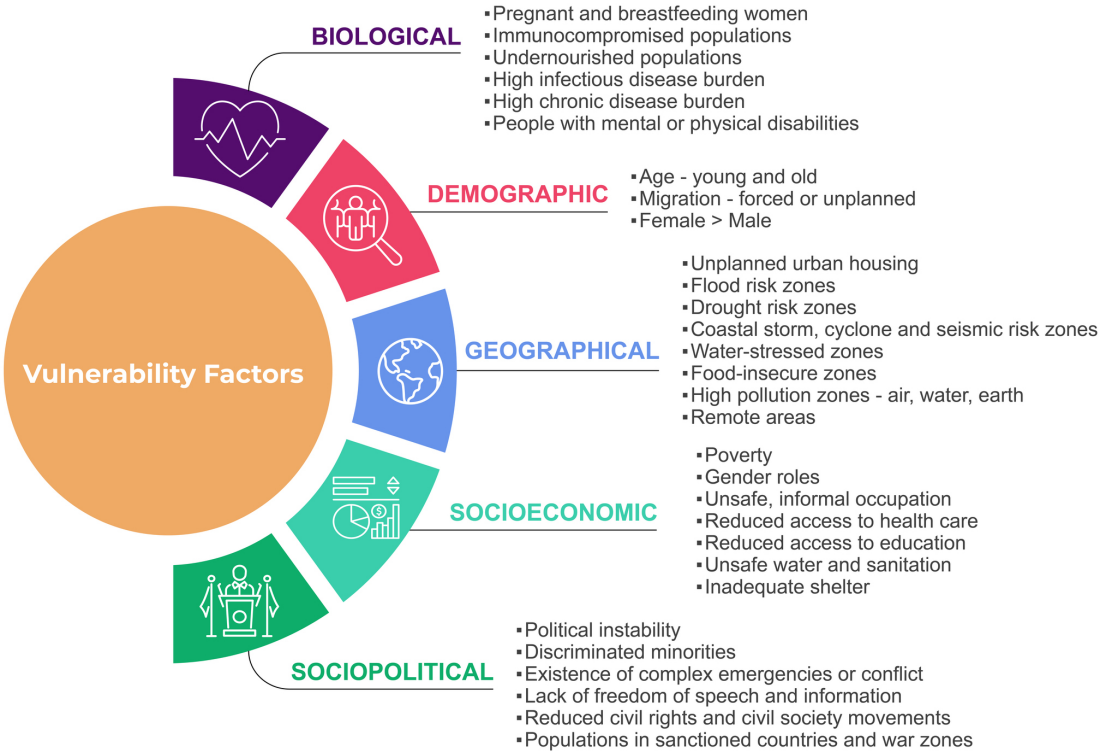

Figure 1 Vulnerability factors which contribute to increased susceptibility to adverse health effects from climate hazards. these include biological, demographic, geographical, socioeconomic and sociopolitical variables. Modified from Figure, Climate change and health: vulnerability and adaptation assessment. Geneva. WHO 2021.[2]

governments and companies continue to prioritise fossil fuels over people's health, which is having significant impacts on nutrition. On average, nearly one-third more land area was affected by extreme drought for at least 1 month a year in the period 2012–2021 compared with 1951–1960.[15]

High temperatures during growing seasons lead to fast crop maturation, reducing the maximum potential yield that could be achieved with no limitations of water or nutrients. In addition, as temperatures rise micronutrient levels in many crops decrease. Rising sea surface temperature, rising temperatures of inland water bodies, acidifying oceans, and reduced oxygenation affect marine and inland fishery productivity. Changes in water and soil quality and supply, livelihood, security, flooding and saltwater intrusion are just some of the health effects of sea level rise.

The Intergovernmental Panel on Climate Change in 2019 estimated that 680 million people currently live in the low-lying coastal zone thereby increasingly at risk from the hazards of continuously rising seas and they projected this number to reach more than one billion by 2050.[16] Many of the world's major cities are also at risk from sea level rise, and this may drive population displacement and significant economic loss

The commercial impacts on nutrition run in tandem to the challenges posed by climate change, and food insecurity. Ending childhood obesity is a key goal[17] as it leads later in life to higher incidence of diabetes, stroke and cardiovascular diseases. Reducing the consumption of high sugar foods and drinks through taxation can be an effective strategy but it is difficult to reach a global agreement on the way forward due to political and commercial reasons.

In addition, sanitation remains a major global problem. Over 1.7 billion people still do not have basic sanitation services, around 500 million still practice open defecation, and approximately 830 000 people in low-income and middle-income countries die each year as a result of inadequate water, poor sanitation and hygiene, accounting for 60% of total diarrhoeal deaths.[18]

REDUCING HARM TO VULNERABLE POPULATIONS

Policy options to deal with these challenges were explored through the WHO-UNICEF-Lancet commission on the future of children's health.[19] The recommendation was to include children when considering all policies including transport, agriculture and trade, urban planning, environment, family services, housing and education. All these factors can impact children's health and influence obesity rates. One of the major themes which emerged from the children in all policies (CAP) report was the need to act on climate now. It would be short-sighted to focus only on children's health today if they do not have a future tomorrow.

A reduction in greenhouse gas emissions as quickly as possible should be our most urgent priority. Collective action on climate is the duty of everyone who cares about children, and we know that we are currently nowhere near approaching the path to net zero. However, we must stay positive since net zero is still possible through the efforts and interactions of government, corporations and individuals. Moving to net zero should not be viewed as a cost but as a potential saving of trillions of dollars when environmental and health impacts are considered. Governments, health systems and individuals need to support renewable energy, cut fossil fuel subsidies, promote active and public transport, develop carbon neutral buildings, reforest and re-wild the environment, recycle, reuse and reduce waste, move to sustainable agriculture with plant-based diets and support green business and infrastructure.

An effective strategy to combat some of the above challenges is community mobilisation, especially when done through local women's groups. This has been shown in controlled trials to be effective in prevention and control of type 2 diabetes.[20] Engaging with children as citizen scientists studying their local environment, and the impact of climate change and climate hazards on their region may be an effective strategy.[21] As part of community efforts, women and children must be at the centre of the sustainable development goals and at the centre of climate change initiatives. Better data for policy-makers are important so resource allocation can be provided. In the last several years, WHO, UNICEF and CAP−2030 have launched a granular, visually descriptive data dashboard to guide policy decision-making for children across sectors.[22] All of the countries where children are currently flourishing are also greenhouse gases high-emitting regions. The children of these countries may be flourishing now, but their future will be in jeopardy without climate action.

The key issue is translating research on nutrition, climate and health outcomes into policy and understanding which policies are likely to resonate with governments and policy-makers.[21]

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