The effects of climate change are far-reaching. While many are focused on the environmental impacts, some researchers are looking at how it affects the health of humans and animals.

Unprecedented extremes in weather in the first half of 2019 have sharpened global concern for climate change. In Southern Africa, Cyclone Idai and Tropical Cyclone Kenneth flooded Mozambique, then Malawi, Zimbabwe and KwaZulu-Natal in March and April 2019, resulting in damage to infrastructure, transportation, services and communication, as well as human and animal life. Yet the greater challenge to scientists, governments and diverse publics is not emergencies such as cyclones, floods and unexpected heat waves.

Climate change and environmental degradation are not usually acute events, immediately felt and recognisable, and their threats to economic sustainability and human wellbeing thus unfold slowly. Drought and water insecurity are chronic events, until the economic and social consequences are catastrophic and the trajectory impossible to slow through remedial measures.

**Incidents of diseases**

The impact of climate change on chronic illness and death is not straightforward but the trends are concerning. Changes in ambient temperature, temperature range, precipitation, water flow and ecology all affect the habitat and behaviour of vectors such as mosquitoes, flies and snails, and can change conditions that allow bacteria to thrive – cholera outbreaks being a case in point. Warmer weather is associated with the increased incidences of malaria, cholera and Rift Valley fever; cooler weather with dengue, chikungunya, zika, and yellow fever. General temperature increases and adaptations by vectors lead to an increased risk of infection for human and other animal populations, with particular effects on those previously unexposed or without semi-immunity.

The modelling of the likely effects of warmer temperatures on disease distribution suggests an increased incidence of vector-borne disease across sub-Saharan Africa, so reversing health gains effected over the last half century. Decreased and/or disrupted supplies of water will impact on hygiene and sanitation, increasing water-wash and water-borne diseases e.g. dysentery, scabies, trachoma, conjunctivitis, skin infections and ulcers. Depleted water supplies will impact on commercially produced food and subsistence production, both urban and rural, disrupting food availability, security and pricing, as well as the cost of potable water locally and nationally. People living in crowded small houses, informal settlements and degraded high rise apartments in the inner city areas are at risk of potentially fatal heat-stress health problems, including dehydration, heat stroke and asthma. Infants and young children are especially vulnerable while older people and others who are immunologically compromised are also at risk.

These trends will all impact people, especially in poorly-resource settings and poor households.

**Threat to health interventions**

For the past 25 years, South African public health academics and policy makers have worked steadily to develop and implement interventions to reduce health disparities and improve community health services, strengthen health systems and reduce persistent economic and social inequalities that limit access to timely and quality health care. Climate change threatens to undo many of these gains, as it impacts unequally within and between communities and countries.

In South Africa and in the region, poor people are especially vulnerable through direct exposure to pathogens and climate-mediated risk factors, and have the least capacity for resilience. The systems in place have limited capacity to remediate these challenges. Primary health centres, often basic structures in rural Southern Africa, are most vulnerable already to fluctuations in power and water; the increased negative effects of climate change will simply exacerbate the inequalities of structure and infrastructure.

**Interdisciplinary efforts key to tackle climate change**

The challenge is to sustain academic and political efforts in relation to climate change and its associated challenges of adaptation, mitigation and sustainability in health as in other arenas. Emerging interdisciplinary conversations and collaborations provide a venue for research to identify locally sustainable ways of mitigating climate change while supporting larger scale global and national efforts. Such interdisciplinary efforts, crossing theories, empirical studies and practices of the arts and sciences, are critical for the innovative approaches that we need to address the challenges emerging with climate change. Climate change emphasizes the interconnection of systems and structures. In doing so, it highlights the need to identify short-term interventions and longer-term actions to avert the possibility of widening geographic, social and health inequalities, and underlines the urgency of the unique collaborative roles of South African scientists.