

Climate Change and Health in Africa

Amongst the long list of challenges impacting the daily lives of people living in Africa, and elsewhere, four, in particular stand out: inequities, conflicts, pandemics and climate change – all of which have significant impacts on population health. Inevitably it is often low income or otherwise marginalized populations who are among those most vulnerable to these challenges, but ultimately, we are all affected. As we are frequently reminded – there is no planet B¹ – which means that we need to do everything possible to address these challenges and find ways of making it possible for everyone on planet Earth to live long and healthy lives and for everyone to have the social and economic conditions to reach their potential.

It may be argued that the four challenges listed above are interrelated and feed off each other, with climate change shown to exacerbate the other three challenges; thus, in this essay, we will focus on climate change and its impact on health in Africa. All evidence shows that, over the next two to three decades, climate change will intensify existing health challenges that many people living on the African continent experience and further strain the already over-burdened health systems.

The unresolved question is not whether this will occur, it is instead what degree of impact will climate change have on health and how can this be mitigated? All estimates show that the earth is heating up at a significantly accelerated rate. According to the Intergovernmental Panel on Climate Change (IPCC)², greenhouse gases have already caused at least 1.1°C in warming and that there are already adverse impacts on food and water security, human health and on the economies of various countries and that vulnerable communities which have contributed least to global warming are disproportionately affected. The IPCC notes that the world must do everything possible to ensure that global warming does not exceed 1.5 °Celsius above pre-industrial levels; exceeding 1.5°C could have long-lasting and even irreversible consequences.

Climate change affect all aspects of planetary health, affecting the environment, humans and animals. The environmental impact includes rising sea levels, changes in the extremes of extreme weather events (e.g., heatwaves, droughts, storms, floods, wildfires), and the compounding of these weather events. As the globe heats up, there are impacts on both animal and human health³. Climate change has exposed humans to food and water insecurity, has resulted in the loss of livelihoods and culture, has driven displacement, and have increased human mortality and morbidity. Apart from human health being negatively impacted, climate change also impacts the economy^{4,5}. Furthermore, climate change has led to the loss and damage of

ecosystems and extreme weather events, such as extreme heat, have led to species losses and mass mortality events in animals. Principal contributors to global warming are the emissions of greenhouse gases, which include carbon dioxide and methane emissions. According to the World Population Review in 2020, the country emitting the highest levels of carbon dioxide emissions was China, followed by the USA, India, Russia and Japan⁶. In contrast, African countries account for less than 4% of greenhouse gas emissions.⁷



Flooding in Uganda (Courtesy of Ronald Musoke)

Although Africa's carbon footprint will likely increase in the coming years as African countries develop economically, there is a familiar unfairness with people living in Africa being amongst those bearing some of the greatest brunt of climate change. The ten countries most vulnerable to the adverse impacts of climate change, according to the International Rescue Committee, are all low-income or lower-middle-income countries: Somalia; Syria; the Democratic Republic of Congo; Afghanistan; Yemen; Chad; South Sudan; Central African Republic; Nigeria; and Ethiopia⁸. Seven of the 10 countries are in Africa, this is of great concern and requires urgent global action.

Current status of health in Africa

Before we review the specific impact of climate change on health in Africa, it will be useful to understand the current health status of the continent. Unfortunately, even before the COVID-19 pandemic, which undoubtedly negatively impacted African countries⁹, the historically weak health and economic systems have contributed to poor health outcomes.

The World Health Organization estimates that of the 295 000 maternal deaths in 2017 globally, 196 000 or 66.4% were in sub-Saharan Africa¹⁰. The worst performing countries in the region per 100 000 live births are: South Sudan (1 150); Chad (1140); Sierra Leone (1120); Nigeria (917); and Central African Republic and Somalia (829)¹¹. Pregnant women in the region fare very poorly when compared to their European and North American counterparts. A women's lifetime risk of maternal death is

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1:37 in our region but 1: 4800 in countries in the north¹².

Similarly, 43% of all neonatal deaths globally were in the region with the countries with the worst neonatal mortality rates per 1000 live births being: South Sudan (40.2); Central African Republic (38.8); Somalia (36.8); Nigeria (25.5); Chad (32.8); and Sierra Leone (31.4)¹³. With a poor start in life, it is therefore not surprising that life expectancy in sub-Saharan Africa is significantly lower in the region (59.7 years) compared to 77.2 years in Europe and North America¹².

That the majority of countries with the poorest health outcomes in the region (South Sudan, Chad, Nigeria, Central African Republic, Somalia) are also the countries most vulnerable to the impacts of climate change should be a concern to everyone. This implies that the people living in these countries can only expect worsening health outcomes over the next few decades and therefore should be the countries that receive the most help to mitigate the impact of climate change.

Human health impacts of climate change

The figure below illustrates the range of health conditions that could be affected by climate change and include the health impacts resulting from (i) severe weather, (ii) air pollution, (iii) changes in vector ecology, (iv) increasing allergens, (v) water quality impacts, (vi) water and food supply impacts, (vii) environmental degradation, and (viii) extreme heat¹⁴. Similarly, Haines and Ebi illustrate how a range of exposure pathways impact health¹⁵, outlining seven exposure pathways resulting in poor health outcomes (i) extreme weather events, (ii) heat stress, (iii) air quality, (iv) water quality and quantity, (v) food supply and safety, (vi) vector distribution and ecology, and (v) social factors.

In the IPCC Sixth Assessment Report, the observed changes and impacts that climate change has already caused are described. The specific health impacts described include mortality from floods, droughts and storms which are substantially higher in countries that are more vulnerable to climate change; increases in the mortality and morbidity during extreme heat events;

increases in climate change-related food- and water-borne diseases; increases in vector-borne disease incidence; increases in mental health conditions associated with rising temperatures; and increases in trauma resulting from extreme weather events.

According to the World Health Organization – African Region (AFRO)¹⁶, between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths globally per year, from malnutrition, malaria, diarrhea and heat stress. The direct costs to health are estimated at between US\$ 2-4 billion/year by 2030. Of concern, AFRO suggests that areas with weak health infrastructure – mostly in low-middle-income countries – will be the least able to cope with the health impacts of climate change without assistance to prepare and respond.

Similarly, the World Bank¹⁷ suggests that 88% (42 of 48) of sub-Saharan countries rank amongst the most at-risk for negative health outcomes associated with climate change. The impact of heat and air pollution¹⁸ on maternal health is becoming increasingly established¹⁹ and includes higher rates of miscarriage, preterm birth, and stillbirth. Pregnant women²⁰ are more vulnerable to heat-related illnesses, while newborns are especially heat-sensitive. Climate change can also affect women and infants in other ways. Gender inequality²¹ and food insecurity are just two ways that the climate crisis intersects with other social, economic, and environmental determinants of health to put the lives of women at risk. Those Africans lucky to reach an old age will be similarly highly vulnerable to heat related illnesses and food insecurity.

What can be done about it: mitigation and adaptation

Concepts like ‘mitigation’ and ‘adaptation’ have been used in the context of climate change and what can be done to turn the tide. According to the UN Environment Programme (UNEP)²² the definition of mitigation refers to: “...efforts to reduce or prevent emission of greenhouse gases” They also suggest that mitigation means “using

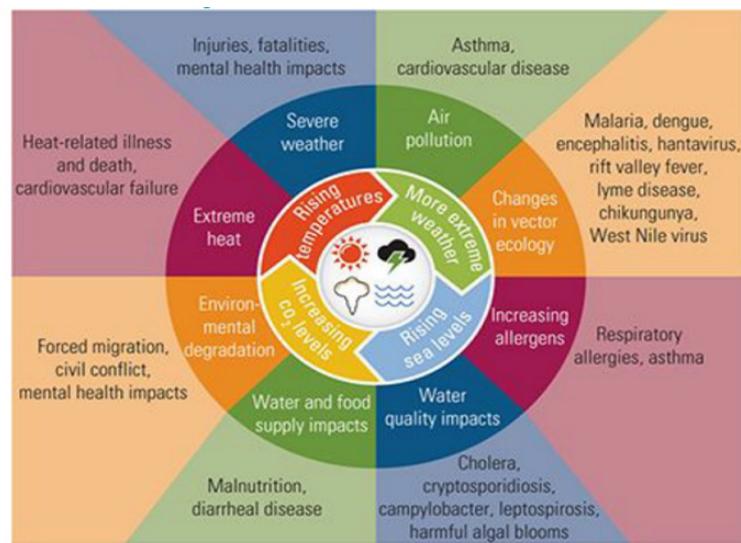


Figure 1: Impact of climate change on health (Evans & Munslow, 2021)

new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior”.

The health sector globally is estimated to contribute about 4% of greenhouse gas emissions and there are a wide range of mitigation interventions possible including reducing energy consumption by transitioning to renewable energy use and being more energy efficient; reducing emissions through changes to the supply chain; recycling health commodities, including those used in surgical operations; and increasing use of digital technology and reducing transporting patients²³.

Adaptation, on the other hand, means “adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects.”²⁴ Given the significant impact of excessive heat (which has already begun to result from climate change) there are a number of other interventions that the health sector should implement to protect patients, especially pregnant women and newborns²⁵.

These interventions include: policies on the needs of pregnant women and newborns which prioritise mitigation and adaptation to climate change; provision of guidance from health workers on the impact of extreme heat, and sharing prevention methods like staying out of the sun during the hottest parts of the day and the importance of hydration; making health services available during cooler parts of the day and providing shelter and water during visits to health facilities; facilitating multisectoral collaboration to ensure the homes are insulated against heat and cold and provision of potable water. In addition, health systems should strengthen climate surveillance and be able to inform patients and communities of increases in temperatures and other weather conditions that impact on health.

Conclusions

Climate changes impact on human existence. This means that it impacts on a vast array of health conditions and outcomes sometimes in ways we cannot fully anticipate currently. Climate mitigation and adaptation is clearly everyone’s business, but the health sector has a particular responsibility to ensure that it is geared to reducing the impact of climate change, including excessive heat, droughts, wildfires and storms on health outcomes. What the health sector cannot afford to do, what nobody can afford to do, is to wait and just hope for the best. All evidence shows that future years will be harder, not easier. Even as we continue to learn about the impact of climate change on health, much is already known and action is imperative to mitigate and adapt if we are to protect.

References

1. The Secretary-General. UN Biodiversity Conference — COP15 Montreal, 6 December 2022. <https://unric.org/it/cop15-un-secretary-generals-remarks-to-the-un-biodiversity-conference/>
2. Allen, M.R., O.P. Dube, W. Solecki, F. et al., Framing and Context. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 49-92. <https://doi.org/10.1017/9781009157940.00>
3. IPCC, 2022: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts,

- M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp., doi:10.1017/9781009325844. https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf
4. Di Napoli, C., McGushin, A., Romanello, M. et al. Tracking the impacts of climate change on human health via indicators: lessons from the Lancet Countdown. *BMC Public Health* 22, 663 (2022). <https://doi.org/10.1186/s12889-022-13055-6>
5. Abbass, K., Qasim, M.Z., Song, H. et al. A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environ Sci Pollut Res* 29, 42539–42559 (2022). <https://doi.org/10.1007/s11356-022-19718-6>
6. World Population Review. <https://worldpopulationreview.com/country-rankings/co2-emissions-by-country>
7. Diagana O. 3 key fronts on which Africa must combat climate change. October 28, 2022. <https://blogs.worldbank.org/african/3-key-fronts-which-africa-must-combat-climate-change>.
8. International Rescue Organisation. 10 countries at risk for climate disaster. <https://www.rescue.org/article/10-countries-risk-climate-disaster>
9. Cilliers J, Oosthuizen M, Kwasi S, et al. 2020. Impact of COVID-19 in Africa: a scenario analysis to 2030. <https://issafrika.s3.amazonaws.com/site/uploads/ar24v2.pdf>
10. World Health Organization. Maternal Mortality: key facts. 2023. <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>
11. Statista. African countries with the highest maternal mortality rates in 2017. <https://www.statista.com/statistics/1122869/maternal-mortality-rate-in-africa-by-country/>
12. Protect the promise: 2022 progress report on the Every Woman Every Child Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030). Geneva: World Health Organization and the United Nations Children’s Fund (UNICEF), 2022. Licence: CC BY-NC-SA 3.0 IGO.
13. UNICEF. Neonatal mortality: The neonatal period is the most vulnerable time for a child. 2023. <https://data.unicef.org/topic/child-survival/neonatal-mortality/>
14. Evans MS and Munslow B. Climate change, health, and conflict in Africa’s arc of instability. *Perspectives in Public Health* 1 November 2021 Vol 141 No 6. <https://journals.sagepub.com/doi/pdf/10.1177/17579139211058299>
15. Haines A and Ebi K. The Imperative for Climate Action to Protect Health. *N Engl J Med* 2019; 380:263-273. <https://www.nejm.org/doi/full/10.1056/nejmra1807873>
16. WHO African region. Climate change: key facts. <https://www.afro.who.int/health-topics/climate-change>
17. 2018. <https://thedocs.worldbank.org/en/doc/824651516135124228-0020022018/render/FINALSSAHotspotNote9Jan2018.pdf>
18. Bekkar B, Pacheco S, Basu R, DeNicola N. Association of Air Pollution and Heat Exposure with Preterm Birth, Low Birth Weight, and Stillbirth in the US: A Systematic Review. *JAMA Netw Open*. 2020;3(6): e208243. doi:10.1001/jamanetworkopen.2020.8243. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2767260>
19. Cherish MF, Pham MC, Area A et al. Associations between high temperatures in pregnancy and risk of preterm birth, low birth weight, and stillbirths: systematic review and meta-analysis. *BMJ* 2020;371:m3811. <https://www.bmj.com/content/bmj/371/bmj.m3811.full.pdf>.
20. Spencer R, Samatheh T, Wabnitz T et al. The Challenges of Working in the Heat Whilst Pregnant: Insights From Gambian Women Farmers in the Face of Climate Change. *Front. Public Health*, Sec. Planetary Health, Volume 10 – 2022. <https://www.frontiersin.org/articles/10.3389/fpubh.2022.785254/full>.
21. UN Women. Explainer: How gender inequality and climate change are interconnected. 28 February 2022. <https://www.unwomen.org/en/news-stories/explainer/2022/02/explainer-how-gender-inequality-and-climate-change-are-interconnected>.
22. UN Environment Programme. UNEP takes a multifaceted approach towards climate change mitigation in its efforts to help countries move towards climate-resilient and low emissions strategies. <https://www.unep.org/explore-topics/climate-action/what-we-do/mitigation>
23. United Nations Climate Change. Adaptation and resilience. <https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction>
24. World Economic Forum. Here’s how the health sector can reduce its carbon footprint. October 24, 2022. <https://www.weforum.org/agenda/2022/10/cop27-how-healthcare-can-reduce-carbon-footprint/#:~:text=Healthcare%20systems%20account%20for%20over%204%25%20of%20global%20CO2%20emissions>.
25. Wheeler S, Ateva E, Churchill R, et al., Short communication: The global health community needs to start planning for the impact of the climate crisis on maternal and newborn health. *The Journal of Climate Change and Health*, Volume 6, 2022, <https://www.sciencedirect.com/science/article/pii/S266727822000207>