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Commentary

Outcomes of a Climate Change Workshop at the 2020 African Conference on Emergency Medicine

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ABSTRACT

A changing climate will have demonstrable effects on health and healthcare systems, with specific and disproportionate effects on communities in Africa. Emergency care systems and providers have an opportunity to be at the forefront of efforts to combat the worst health effects from climate change. The 2020 African Conference on Emergency Medicine, under the auspices of the African Federation for Emergency Medicine, convened its first ever workshop on the topic of climate change and human health. Structured as a full day virtual course, the didactic sections were available for both live and asynchronous learning with more than 100 participants enrolled in the course. The workshop introduced the topic of the health effects of climate as they relate to emergency care in Africa and provided a forum to discuss ideas regarding the way forward. Lectures and focused discussions addressed three broad themes related to: health impacts, health care delivery, and advocacy. To our knowledge, this is the first workshop for health professionals to cover topics specific to emergency care, climate change, and health in Africa. The results of this workshop will help to guide future efforts aimed at advancing emergency care approaches in Africa with regard to medical education, research, and policy.

African relevance:

- Climate-related extreme weather events are adversely affecting health and health care delivery in African countries.
- African organisations, cities, and nations have taken positive steps to adapt and build climate resilience.
- There are opportunities for emergency care professionals and scholars to continue to expand, and lead, climate and health education, research, and policy initiatives on the continent.

Background

Anthropogenic climate change is warming the planet, causing extreme weather events and sea level rise, which threaten lives and livelihoods. Even more, the effects of a changing climate are not distributed equally. While all nations are threatened, specific communities and regions are at increased risk of adverse health effects due to exposure and underlying vulnerabilities [1]. Those most at risk are

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nations and individuals with fewer resources and less adaptive capacity, leading to projected significant exacerbations of existing health inequities [2]. Countries in Africa are particularly susceptible due to location, climate-sensitive diseases, and socioeconomic disparities [3].

In Africa, disasters are already a significant cause of morbidity and mortality. Estimates suggest that loss of healthy life years from climate change are predicted to be up to 500 times greater in Africa than in Europe [4]. Increasing malnutrition, traumatic injuries, disease exacerbations of chronic illnesses, mental health effects, and changing infectious disease burdens represent some of the many ways climate change negatively impacts human health in Africa [5]. Climate change will also likely lead to increasing extreme weather events in the region with increasing negative consequences from both direct and indirect threats to health. Water scarcity and other stressors affect basic sanitation and infection control in community and health care settings [6]. Recently, cyclones Idai and Kenneth in March and April 2019 led to increased morbidity and mortality in Mozambique, Zimbabwe, and Malawi from the secondary effects of cholera outbreaks, housing instability, and loss of access to food and health care services [7].

Health care professionals are increasingly aware of the health effects of climate change, and have helped to drive recent advances in education, research, and national and international policies [8,9]. Their perspectives on the local health impacts, vulnerabilities to extreme weather events, and potential solutions make them valued patient advocates and drivers of policy change. Health professionals can be crucial voices in government, non-governmental organisations, and professional societies with measurable spheres of influence, incorporating a "health in all policies" approach and advancing the broader field of planetary health [10]. Emergency care providers, in particular, are experienced in caring for critically ill patients with climate-sensitive conditions such as those in respiratory distress from asthma exacerbations due to atmospheric particulate matter [11]. Emergency centres are also relied upon by communities during times of climate-related disasters: floods, cyclones, wildfires, extreme heat, droughts, dust storms. In 2019, nearly 100 million people were affected by disasters, 97% of those were secondary to climate and weather-related disasters [12]. Typical emergent conditions as well as injuries and patterns of disease more prevalent during times of disaster make preparedness imperative to responding to meet surges in demand. Emergency professionals recognise these complex needs as frontline care providers in their communities. Similarly, the World Health Organization recognises the importance of timely care for the acutely ill and injured as a human right [13].

Both emergency medicine education and emergency care systems have seen rapid growth in development throughout the continent. The current state of education, research, and policy of climate change and emergency care in Africa is just beginning. To our knowledge, this is the first workshop for emergency care professionals that addresses issues regarding climate change and health on the African continent.

AFEM background

Founded in 2009, the African Federation for Emergency Medicine (AFEM) represents a coalition of societies, organisations, and members from more than 40 countries across the continent aimed at supporting the development of emergency care. For the last 9 years, AFEM has sponsored a biennial conference, the African Conference for Emergency Medicine (AfCEM) held in rotating African countries. AfCEM is Africa's largest and most widely attended emergency care event for research, education and networking. Collaborative global work that supports high-quality emergency care, including the development of emergency care systems, forms the foundation for the AFEM model [14], which includes leadership development, advocacy, collaboration, research, education and training, and policies and frameworks. Climate change and health substantively intersects across the six components of the AFEM model and highlights opportunities for enhanced leadership in climate action among emergency providers. To focus on this opportunity, AfCEM 2020 was the first to include a full one-day workshop devoted to climate change, health and emergency care in Africa.

The aim of the workshop was to introduce participants to core climate and health content and provide a forum for focused discussion on the topic. A secondary aim was to begin to develop a longer-term agenda related to the topic. The following objectives were outlined prior to the workshop.

1. To introduce common ideas about climate change, health impacts, and emergency care service delivery.
2. To provide a process for thinking about how climate-driven extreme weather events have and will disrupt emergency care systems.
3. To provide toolkits to assess health care facility resilience in the setting of disaster.
4. To propose an advocacy agenda for emergency health profession leadership for policy changes, increased climate change communication, and enhanced education across disciplines.
5. To identify potential champions within AFEM and initiate discussion for future projects and support based on AFEM stated goals.

After completion of this education and advocacy workshop, health professionals and health care leaders would gain the knowledge and skills to educate and build system resilience within their current work environment and adapt to the impacts that climate change is having on the health of their communities.

Workshop outcomes

A total of 109 people attended the workshop asynchronously and approximately 5–15 participants were on each livestream. Participants included medical students, residents/registrars and medical officers, nurses, pre-hospital providers, educators, and researchers. Each session began with an outline, objectives, and concluded with key resources for health professionals and researchers. Recordings and slides were shared following the event to participants via an open online educational platform via Canvas [15]. A summary of content was as follows (Table 1).

Discussion

This description represents the first workshop to explore the intersection of climate change and health at the AfCEM. There was clear interest in the topic by participants and recognition of the health impacts as well as opportunities to enhance health professional education. The authors acknowledge the limitations of the representation of this cohort as self-selected workshop participants willing to engage with the climate change issue. However, local workshop participants strongly signalled their support of the relevance of the topic to a wider range of African emergency care practitioners.

From the pre-conference and associated working group feedback, the authors propose an agenda for a path forward to 1) improve health professional education on climate and health, 2) increase evidence-based research on climate-related health impacts and evidence-based interventions, and 3) engage more emergency health professionals from the African continent in local, national, and international climate policy work. All proposals are with the aim of developing solutions that are context-specific to African countries.

Education

We propose the development of curricula at all levels of health professional education and continuing medical education, that either stands alone or could serve to be integrated into existing structures.

Education is a necessary driver of climate action. Health professional students at all levels have incorporated climate and health into traditional curricula [33,41–44]. Other health professionals without

Table 1
Core content of the first pre-conference on climate change, emergency care and Africa.

Objectives	Content description	Key resources
Session 1: Climate, health impacts, and emergency care		
Identify acute and chronic climate stressors and improve participant understanding of exposure pathways and health impacts pertinent to emergency care practice	● Introduction to climate science and anthropogenic climate change with emphasis on social and environmental factors that impact health and health outcomes, especially for vulnerable groups on the continent ● Interviews with local health professionals and a presentation by a lead author for the United Nations Intergovernmental Panel on Climate Change (IPCC) for 15 years, provided context to local health threats, and opportunities ● A historical timeline of key events dating back to 1926 ● Description of the five major clinical domains that are changing due to climate change: trauma, communicable diseases, non-communicable diseases, mental health, and increased disaster frequency requiring emergency centre surges in demand	● IPCC Fifth Assessment Report [1] ● 2019 Report of *The Lancet* Countdown on Health and Climate Change [16][a] ● The Imperative for Climate Action to Protect Health [17] ● State of the Climate of Africa 2019 [18]
Session 2: Climate-smart healthcare—Making things work in your context		
Define climate-smart healthcare and introduce frameworks for building resilience that support the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction	● Definition of climate-smart healthcare according to the World Bank and case studies from Madagascar and other African nations ● Emphasis on extreme weather events including tropical cyclones, wildfires, drought and water scarcity, flooding, and heat ● Frameworks to build health care facility resilience against acute and chronic climate stressors with specific focus on wastewater systems, potable water, nutrition, medications and supply chain, energy, transportation and external infrastructure ● Other topics on displacement and migration, medical evacuations, and parallels of climate change with the Covid-19 pandemic ● Concepts of net zero emissions and pollution from healthcare, which includes device procurement and health care's climate footprint ● Presentation on groundWork (non-profit environmental justice and development organisation), Health Care Without Harm, and Global Green and Health Hospitals specific to Africa	● Sendai Framework for Disaster Risk Reduction [19] ● Climate-Smart Healthcare: Low-Carbon and Resilient Strategies for the Health Sector [20] ● Madagascar Climate Change and Health Diagnostic [21] ● Guidance documents for health care facility resilience [22,23] ● Climate change, migration and displacement [24,25] ● Net zero emissions & pollution from healthcare [26–30] ● Global Green and Healthy Hospitals [31]
Session 3: Empowering action—Translation to providers		
Identify opportunities to advocate for patients and review educational initiatives on climate and health, current research, and keys to effective climate change communication	● Traditional health advocacy was placed within a climate and health context with climate justice and human rights at the centre of the work ● Opportunities to become involved in local, national, and international climate action ● Resources to practice written and oral communication skills with diverse stakeholders in government and other sectors (Climate Nexus, The OpEd Project, Climate Signals, African Climate Alliance) ● Review of international structured and unstructured educational initiatives and other scholarly work that applies health care professional skills in leadership, communication, and critical thinking ● Research barriers and opportunities with a focus on population health and cross-disciplinary collaboration ● Toxicology case of venomous snakebites as a growing emergency medicine threat with intersections of warming, urbanisation, poverty, and access to care ● Positive steps that countries in Africa have already taken to address the climate crisis and protect people in urban and rural settings	● Global Consortium on Climate and Health Education [32] ● Assessment of Climate-Health Curricula at International Health Professions Schools [33] ● Climate Change and Human Health literature portal [34] ● World Health Organization Health and Climate Change toolkit [35] ● The International Disaster Database [36] ● C40 Cities and Accra's Climate Action Plan [37] ● Seychelles' Coastal Resilience Initiative [38] ● National Adaptation Plans [39] ● Health and Climate Change Country Profiles [40]

[a] Since the time of the workshop, the 2020 Report of *The Lancet* Countdown on Health and Climate Change has been released.

formalised training are informing patients on climate-related disaster and disease risks specific to location. They are preparing for climate-related resource constraints or impacts that affect access to care and health service delivery; they are using media to inform the public of the current science of climate change [45,46].

We believe an integrated climate change curriculum in medical education and similar health professional studies would enhance training quality, build leadership skills, and address some workforce shortages by better preparing providers for disasters and climate-sensitive conditions. Material should be cross-cutting as the health impacts of climate change affect every organ system. This approach may serve as a foundation for developing a professional climate lens whereby in clinical years and as specific areas of interest develop, climate change is incorporated into scholarly work and clinical practice. The approach would support recommendations to improve medical education and population health in Africa [47] and could easily be incorporated into the most up-to-date pedagogical format [48].

Dedicated climate and health elective time could provide additional experiences for students or postgraduates looking to obtain a dual-degree or extra time allocated to research or advocacy. Cross-disciplinary collaboration is encouraged and may address shortages in available faculty to teach climate and health in some regions. In emergency medicine specifically, climate and health overlap with principles in medical education, social emergency medicine, disaster medicine, administration and operations, emergency medical services, health policy, global health, and wilderness medicine. Finally, climate change education offers a space to develop a global perspective and united approach toward equity and the pursuit of global health through standardised educational competencies across income settings [49].

Research

We propose the development of a research agenda, through a formal process of assessing the current literature, assessing known gaps, and assessing future needs and readiness for change.

Although a diverse body of work exists that recognises the impacts of climate change on health, including flood and cholera outbreaks [50], heat effects [51], Rift Valley Fever [52,53], allergens [54], malaria [55], nutrition [56], electrical shedding [57], workforce training and supply opportunities [58,59], injuries [60] such as occupational hazards [61] and violence associated with a changing climate [62], there is minimal literature on: 1) The effects that these changes will have on emergency care practice specifically, 2) how emergency care systems (ECS) can mitigate and adapt to these changes to help reduce the effects of a changing climate in Africa, and 3) which emergency-based interventions will lead to improved outcomes for patients affected by climate-related events.

A solid research base offers a way to support educational and leadership curricula [63], advances in ECS, partnerships aimed at programmatic efforts, and changes in policy at the local and national level. As a first step, researchers should begin to measure the association between climate related impacts and health related outcomes at the national, subnational, and facility level. Additional ongoing research on emergency care in Africa can incorporate factors specific to climate change. Future studies should seek to elucidate provider and health systems 'readiness for change' and status for engagement in larger process improvement efforts to combat the effects of and prepare the effects of climate change. Lastly, research should be developed on the pragmatic implementation of interventions aimed at mitigating the worst effects of climate change on emergency care service delivery and health.

Policy

We propose health professionals, health researchers, and health advocates are empowered and invited to engage as key stakeholders in all steps of the climate change policy process in partnership with policy makers.

An essential component of providing emergency care is ensuring climate resilience is built into the ECS [64]. Policies may ensure that existing and future emergency centre infrastructure is climate resilient; early warning systems and disaster plans are current and actionable; climate and health education is incorporated in all levels of health professional education; emergency centres have emergency response checklists [65] that incorporate climate threats and protocols; health care facilities have energy resilience to offer definitive care for patients requiring surgical interventions and procedures; health facilities commit to minimising their climate footprint; Health and Climate Change Country Profiles are incentivised; health is in all National Adaptation Plans on the continent [66]; renewable energy is scalable across nations [67]; and African leaders are involved in special reports on climate change and health at all international convenings. Tools specific to emergency care can advance research on the ECS and make it easier for emergency care providers and policy makers to advocate for culturally relevant public health solutions [68].

National policies can scale research and scientific evidence to better prepare and respond to extreme weather events. This will be particularly important with projected increases in disasters that harm those most vulnerable [1] and as population growth and urbanisation increase exposure [69]. Specific policies that strengthen public health infrastructure and technology [70], develop the ECS [71], and provide workforce training may in fact meaningfully begin to address the global burden of diseases and injuries resulting from climate change, along with global efforts in mitigation.

Health professional societies offer another avenue to influence policy change. Existing professional organisations working to strengthen healthcare in Africa, AFEM, International Federation for Emergency Medicine, Consortium for Universities for Global Health, among other international organisations, have the ability to leverage their influence and professional member influence to participate in international mitigation, adaptation, and resilience building efforts, as well as prioritise financial and human resources to best meet the needs of people most vulnerable to the effects of climate change on the continent. The participants in the pre-conference proposed a Declaration on Climate Change and Health (Appendix). The Declaration will be submitted for commentary and adoption to AFEM and other regional organisations ready to outline their commitments to a healthier future.

In 2009, The Lancet stated, "health professionals have barely begun

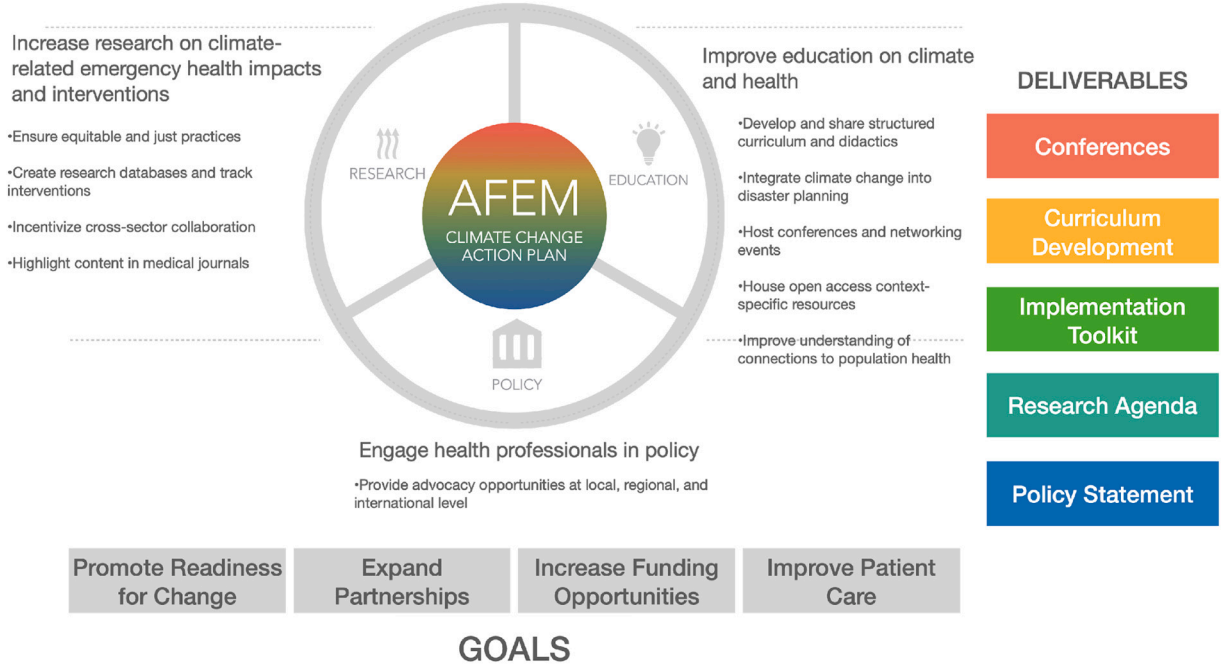

Fig. 1. Proposed climate-related action steps for the African Federation for Emergency Medicine.

to engage with an issue that should be a major focal point for their research, preparedness planning, and advocacy" [2]. More than ten years later, members of the Global Climate and Health Alliance stated a continuation of the same: "health professionals can and must join the growing global community of science-based advocates working to achieve the goal of the Paris Agreement" [10]. The message is clear: A call for global health professional action.

African Emergency Care Climate Change Action Plan

We believe AFEM can serve as a model for similarly structured emergency medicine organisations, which collectively could catalyse international collaboration to expand current education, research, and policy initiatives on climate change for advancement of health and well-being. AFEM could serve to prioritise and operationalise next steps such as those proposed, but not limited to, in Fig. 1.

Conclusion

Climate change and health represents a new landscape for global health collaboration for emergency care professionals and researchers. And, it lays a novel foundation for sustained academic and community partnerships. Health professionals in Africa have an opportunity to lead their nations in climate change adaptation and resilience. Competing priorities, governance, and a global pandemic are potential barriers but also a moment to choose a transformed path of justice and health for those in leadership positions. As emergency centres are increasingly impacted by the effects of climate change, leadership by emergency care professionals will be essential to guide their patients, colleagues, facilities and emergency care systems in preparing and responding to meet the challenges.

CRediT authorship contribution statement

Authors contributed as follow to the conception or design of the work; the acquisition, analysis or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: CR 30%, CB 15%, ECH 15%, and all others ET, PB, SS, IM, WS, OAP, LAA, ED 5% each. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

Declaration of competing interest

The authors declare no conflicts of interest.

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Dissemination of results

Contents from this workshop were shared via a virtual conference platform. Access to the presentations are available via www.youtube.com/channel/UCWI9gGRsJaUwmklmKYSirNQ.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.afjem.2021.05.003.

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