Need and scope for integrating climate change into medical education- towards preparing future healthcare professionals.

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❑ Abstract:

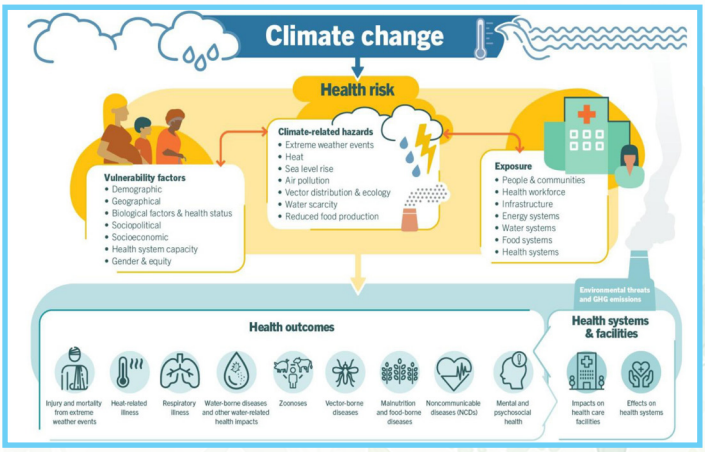
This article delves into the need to integrate comprehensive education on the social and health effects of anthropogenic climate change into medical curricula. The paper explores the profound impact of climate change on human health and argues that preparing future healthcare professionals through targeted medical education is essential for them to identify the effects of climate change and become confident in mitigating and adapting to these emerging challenges.

❑ Background and Introduction:

Anthropogenic climate change, i.e., climate change due to human actions, poses unprecedented threats to global ecosystems, and its consequences increasingly affect human health. Mention of climate change by modern scientists was first made in the year 1896, and 128 years later, the world is facing extreme weather events, temperatures are reaching record high levels, and the effects of these are borne by all, with the most severely affected ones being those who had the most negligible role in climate change. While the earlier years saw a significant debate on climate change and its impact, over the past few decades, the economic, social, and medical effects are now well documented. Though the existence and extent of climate change continue to be debated by a few, this article reviews the direct health effects of climate change, including heat-related illnesses driven by record-breaking extreme temperatures, respiratory conditions, and cancers due to deteriorating air quality, changing vector-borne and infectious disease patterns, extreme weather event related health suffering. [1] [2] [3] [4]Evidence of these effects in all parts of the world and the country is well documented, underscoring the urgency of educating medical students on these interconnections. This article also discusses the indirect effects of climate change on human health and the healthcare system through food and water security disruptions, displacement, and mental health issues. Medical education should prepare students to recognise and manage the multifaceted consequences of climate change on vulnerable populations.

❑ Evidence on direct and indirect effect of climate change on human health

Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (AR6) estimates that nearly 3.6 billion people already live in areas highly susceptible to climate change. [5] According to the World Health Organization, between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from undernutrition, malaria, diarrhoea and heat stress alone. The direct damage costs to health are estimated to



be between US$ 2–4 billion per year by 2030, and the areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond. [6]

According to the 2023 report of the Lancet countdown on health and climate change, the past eight years were the warmest ever registered, and July 2023 was the hottest month ever recorded. [1] [7], [8]The frequency of heatwave days has increased twofold and is projected to increase soon. The direct health effect is the resultant mortality, especially in vulnerable populations and those at extremes of age. The projected mortality at mid-century due to heat-related illness is in the millions. India is among the top 5 nations likely to suffer the most due to rising temperatures. While mortality is something that the medical fraternity quickly understands and works towards, the indirect effect of increasing temperature on labour loss, economy and resultant mental illnesses and inequity is something that is affecting the medical ecosystem, too.

Over the past decades, globally and in India, the problem of malnutrition has been recognised, and significant progress in reducing morbidity and mortality is being made. This progress has been threatened because of climate change's impact on food systems, wherein droughts and resultant food insecurity are on the rise.[9], [10] The land area affected by droughts is projected to increase in the coming years, and the effects of these on human health will increase the need for medical treatment of micro and macro-nutrient deficiencies.

The changing temperature and rain patterns increase climate suitability for vector-borne diseases, and healthcare professionals have reported this nationwide. The number of months of high transmission of vector-borne diseases is changing. With this, we must adjust our preventive, promotive, and curative services planning and delivery.

❑ Role of medical professionals in preventing further environmental degradation and tackling effects on human health

Medical professionals have always played a pivotal role in understanding, preventing, and mitigating the health impacts of the environment, human behaviour, and external sources like vectors. Due to these efforts towards understanding human suffering and collaborative efforts to find solutions to health problems, tremendous progress has been made in reducing morbidity and mortality of diseases and conditions. However, these gains have not benefited all humans uniformly, and the country and the world are still battling inequity and human suffering.

❑ Status of climate change integration into the medical curriculum

A survey done in the year 2020 by the International Federation of Medical Students Association, spanning 2817 medical schools in 112 countries, found that climate change is taught in only 15% of medical schools worldwide and, in 12% of medical schools, climate health teaching activities are led by students and not faculty members.[11] Evidence shows that medical students wanted access to resources related to health and healthcare sustainability and guidance on how to make practical steps towards reducing environmental impact within clinical settings. [12]While the World Health Organization in 2018 recognised Climate change as the biggest threat to global health of the 21st century, the survey shows that future doctors aren't sufficiently trained to recognise the interdependence between health, ecosystems, and climate change, which leaves them unprepared to address the needs of their patients and communities.

❑ The case for enhanced incorporation of climate change in the medical curriculum

This article emphasises the importance of incorporating climate change education into medical training to equip future healthcare providers with the knowledge and skills necessary to address the complex challenges of a changing climate. While many of these issues might appear to be linked to social determinants of health at first glance, a deeper look reveals that these are also issues clinicians at all levels would face in their practice. For instance, while it is crucial for a doctor at the primary and secondary levels to take a history of heat and air pollution exposure, their competency also needs to be built on disease epidemiology and signs and symptoms for considering heatstroke in differential diagnoses and be equipped with evidence-based clinical protocols for management of heat-related illnesses.

To track the morbidity and mortality of diseases, one of the challenges faced worldwide is correctly recognising disease conditions and diagnosing them, documenting these diagnoses using standard ICD codes and preserving and analysing such records. While medical certification of cause of death has seen improvement over the years, climate change-related illnesses are not well documented. Towards this end, it is also vital to teach common diseases exacerbated by climate change during the pathology and clinical rotations in a way that students can recognise and report climate change-related diseases or conditions directly leading to death (for example, heat stroke or lung cancer in a non-smoker), report chain of events and underlying cause of death (example heat-related illness in patients of diabetes or stroke).

As one of the most trusted voices in the community, health professionals also have a role in setting an example by changing their attitudes and behaviours and acting on sustainable healthcare practices and sustainable, climate-friendly healthcare delivery.[13] This will also enable them to discuss greenhouse gas emissions and sustainability measures with their patients and the community.

Globally, as well as in India, climate resilient and environmentally sustainable practices are being adopted in the health sector to reduce greenhouse gas emissions and make healthcare facilities more resilient and prepared for climate change-induced emergencies. Energy efficiency measures like solarisation of healthcare facilities, replacement of non-LED bulbs with energy-efficient LED bulbs and structural changes to reduce electricity consumption are being adopted on a large scale. Today's medical students are tomorrow's healthcare managers and practitioners, and they must be taught these upcoming measures in the formative years of their long medical careers to fulfil their crucial role in climate adaptation and mitigation.

❑ Approach to integration of climate change education in the medical curriculum.

Medical and allied paramedical curriculum boards and colleges can refer to various research studies, best practices, and experiences in integrating climate change into medical curriculum and frameworks developed by IFMSA and other organisations while creating a Climate Change and Medical Education Framework with core competencies and learning objectives for climate change- planetary health-related topics. Collaborative efforts between medical schools and environmental science departments can also be explored to enhance students' ability to address complex challenges at the intersection of health and the environment. Case examples from these collaborations and initiatives can inspire other institutions to adopt similar approaches. Experiential learning opportunities like disaster response simulations can improve adaptive capacity.

❑ Conclusion

Through this paper, the authors make a case for the role of informed healthcare professionals in advocating for policies that address the root causes of climate change and promote resilience in healthcare systems.

The direct and indirect effects of climate change on human health and its implications on clinical and healthcare management practices thus underscore the critical role of medical education in preparing healthcare professionals to navigate the complex intersection of climate change and human health. The proactive integration of climate change topics into medical curricula is essential for fostering a generation of healthcare providers capable of addressing the evolving health challenges associated with anthropogenic climate change.

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