

each day, all 23 NGO volunteers and the NGO heads participated in song and dance. Beginning without any preamble or questioning, everyone formed a circle and proceeded to spontaneously sing songs. And, in random but thorough sequence, every member of the group—even the NGO heads—was encouraged and insisted upon entering the circle to dance solo for the amusement and enjoyment of the rest. Thankfully two other men who knew how to dance accompanied me, and my awkwardness and inability to gracefully move my hands were excused. We were lucky to have been forewarned about the singing and so had prepared two or three songs of our own to contribute. This is the one thing that can be prepared for, so take heed! Any foreigners who travel to India will find themselves sorely removed from festivities unless they have something in their back pocket that they can perform.

In light of the cultural and social differences we faced during the three days, the course was a success. Only by being flexible with translation and time and releasing our Western grip on expectations were we able to truly enjoy the experience.

For future teams, this shift in mindset is essential to functioning abroad. Each individual must accept that everything will be slow. Language will be a barrier. Resources will be scarce. Plans will change, and expectations must be put aside. Entertainment as a unifier will be an essential element of group bonding. These are the skills and realizations that took us months to hone, and despite our shortcomings illustrated above, the first aid course achieved its goals. We were able to change some misconceptions and had a chance to experience the unique qualities India offers foreigners before returning home. 

*Names have been changed for this article.

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Why Med Students Should be Heated Up about Climate Change

Michael A. Benusic^a, BSc

^aVancouver Fraser Medical Program 2014, UBC Faculty of Medicine, Vancouver, BC

ABSTRACT

Future climate change is predicted to have a devastating effect on human health, with attributable morbidity and mortality already occurring. Climate-sensitive diseases such as malnutrition, diarrhea, vector-borne illnesses, and cardiovascular and respiratory disease are projected to increase, mainly in populations with an already high disease burden. Ironically, those who are most vulnerable are those who contribute the least to global greenhouse gas emissions. As health care professionals we can serve a unique role in national and international climate change policy and reduce emissions by promoting lifestyle choices that co-benefit health.

KEYWORDS: *climate change, environmental health, global health, climate-sensitive diseases*

INTRODUCTION

In 2009, climate change was declared the biggest global health threat of the 21st century.¹ A startling statement, especially since it didn't arise from some left-wing blog post, but from one of the grails of peer-reviewed medicine. For me, this was a big moment—I expected that the health community would embrace the challenge and become a leader in climate change advocacy. Naively optimistic, no? After two years of medical school, I chose to supplement my non-existent training through an internship with the Climate Change and Human Health team at the World Health Organization. I was quickly humbled by my lack of appreciation of how a changing climate permeates throughout human life, and

the real scale of the problem. I provide here a synopsis of what I have learned: the global health effects of climate change and what we as future health care professionals can do about it. Hopefully, it will be enough to raise your temperature a few degrees.

Addressing the Elephant

To begin, a big question needs to be answered: is climate change real? The Intergovernmental Panel on Climate Change (IPCC), which draws expertise from thousands of scientists from nearly 200 countries, states that 'climate change is unequivocal' and that most of the warming seen since 1950 is due to greenhouse gases from human activities.² This verdict is echoed in the scientific community by all major environmental-science bodies in the USA and Canada, and the vast majority of peer-reviewed articles on climate change.³ Public perception, while often shown as polarized in the media, also reflects this viewpoint: a 2012 study

Correspondence

Michael Benusic, mbenusic@alumni.ubc.ca

found only 2% of Canadians do not believe that climate change is occurring.⁴ If there were this much evidence and support for any medical treatment or procedure, it would be malpractice to deny it.

The Health Effects of Climate Change

With that out of the way, let’s move on to what matters to us—how climate change is a threat to health. In the last 20 years, climate change has been estimated to cause over 150,000 deaths, or a loss of over 5.5 million disability adjusted life years, annually.⁵ By altering environmental conditions, numerous different pressures

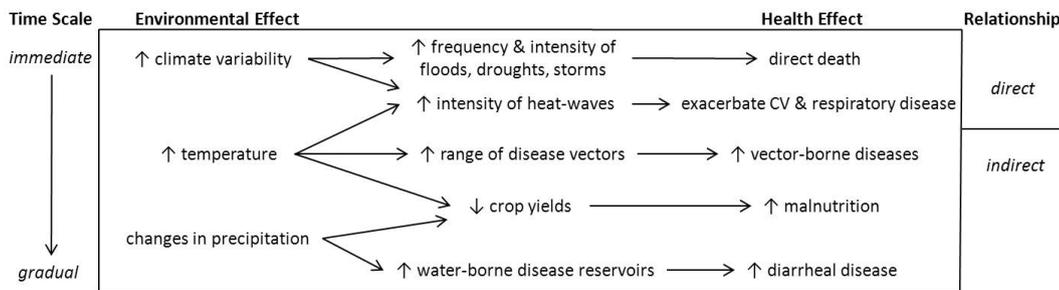


Figure 1. The environmental and resulting health effects of climate change.⁶

are placed on human health, a relationship that is summarized in Figure 1. The causes for this excess morbidity and mortality can be separated into two categories: direct effects (extreme weather events, heat waves), and indirect effects (vector-borne diseases, diarrheal disease, malnutrition).

Extreme weather events

In the last decade, over 2.5 billion people have been affected by weather-related disasters.⁷ Since the 1970’s, the frequency of heavy precipitation events, the intensity and length of droughts, the number of people affected by coastal flooding, and the intensity of cyclone events has increased—trends attributed by the IPCC to anthropogenic causes which are expected to continue.²

Heat waves

With a rising global temperature and greater climactic variability, the frequency and intensity of heat waves has increased worldwide.² As recent examples, the extreme heat waves in Southern USA in 2011 and Europe in 2010 are statistically very likely to be a consequence of global warming,⁸ and contributed to a \$5.2 billion loss in crop and livestock in Texas⁹ and 11,000 deaths in Moscow alone.¹⁰

Vector-borne diseases

The vectors and pathogens of vector-borne diseases are intrinsically affected by climate. To a certain threshold, vector and pathogen range and prevalence will increase with warmer temperatures.¹¹ The prevalence of malaria, which causes 200 million disease cases per year,¹² has increased in African highlands where cooler temperatures previously kept transmission low.¹³ Projections of malarial spread by 2050 include the southern United States and southern Europe.¹⁴ Dengue fever prevalence has risen rapidly in the past 40 years, and climate projections place an additional 2 billion people at risk by 2080.¹⁵ Closer to home, the prevalence

of Lyme disease is predicted to increase in Canada, especially in southern BC and Ontario.¹⁶

Diarrheal disease

Diarrheal disease kills 1.5 million children every year,¹⁷ and is highly climate-sensitive in areas with inadequate water and sanitation systems. In Lima, Peru, rates were found to be 55% higher during an El Niño summer (~3 degrees warmer), and significantly correlated to temperature.¹⁸ As well, floods and droughts will increase water-borne illness rates by disrupting and depleting safe drinking water.¹

Malnutrition

Most of the disease burden attributed to climate change is through the negative impact of increased temperatures and precipitation changes on crop yields and food security.⁵ Nearly 1 billion people do not have adequate food sources,¹⁹ and 3.9 million child and maternal deaths are due to undernutrition each year.²⁰

Through the loss of livelihood and farm assets, decreased crop yields, and desertification, climate change has the potential to increase the number of people facing food insecurity by 25% before 2080.²¹

Vulnerability and Equity

For all the diseases listed, most of the burden will be borne by those who contribute least to the crisis. A nearly inverse relationship exists between greenhouse gas emissions by country and health consequences (Figure 2).

This irony is not because climate change only impacts select areas; it is due to the discrepancies in socioeconomic systems, resilience, and pre-existing vulnerabilities. For example, while the 2011 US heat event and drought had a high economic cost, human health effects were minimal. Conversely, similar agricultural losses in a less-food-secure area can produce devastating results:

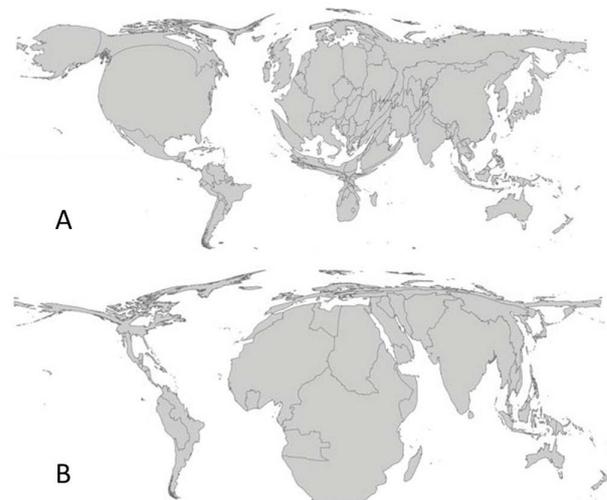


Figure 2. Greenhouse gas emission by country (A) compared to relative mortality attributed to climate change (B).²²

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the 2011 East African drought killed tens of thousands, and a quarter of a million people faced famine.²³

What can we do?

Unchecked climate change presents a grim scenario of future global health. The scientific community has set a rise in global temperatures of 2°C above pre-industrial levels as their benchmark for disaster. It is predicted that at this level, positive feedback mechanisms such as methane emissions from thawing permafrost will skyrocket emissions.²⁴ It is estimated that a global greenhouse gas concentration of about 170 ppm above pre-industrial baselines would lead to this²⁵, and we are already three-quarters of the way there.²⁶ The time to act is now (or, better yet, a century ago).

How best to act, however, is not easily answered. Like many social and environmental determinants of health, climate change presents an issue that cannot be solved by the simple diagnosis–intervention paradigm. Without a clear path to a solution, it seems that we get lost and become compliant in low-yield ‘band-aid’ fixes – switching charts to recycled paper, installing fluorescent light bulbs, ‘greening’ home and offices. All positive efforts, but minute in scale and failing to recognize the unique position we have in advocating human health in a climate topic.

On an international level, we can join the IFMSA at intergovernmental conferences to move health to the forefront of climate change policy. The disease burden of climate change presents a human side to the issue, one that makes the issue more real than polar bears and ice caps. Focusing the discussion on human lives could be a sufficient jolt to the currently asystolic Conference of the Parties (COP) meetings and make a binding treaty for emission reductions a reality.

Nationally, we can join the CFMS and CMA in lobbying our government to return to its former role as a climate leader and set meaningful emission targets while investing in adaptation programs for those affected by climate change at home and abroad.

Understandably, few of us will prioritize climate change enough to become after-work lobbyists and conference delegates. Therefore, it is important to realize that climate action can be incorporated into routine clinical practice by promoting lifestyles that help prevent the big killers (cardio/cerebrovascular disease and cancer) and just happen to mitigate greenhouse gas emissions as well. By counselling patients on active transportation (biking, walking) and reduced meat consumption, you will be indirectly tackling two of the biggest emission culprits.²⁷ Stepping outside the office, there is a definite role to be played (and a good use for a physician’s social capital) in municipal or regional advocacy for infrastructure and policies that permit these lifestyles, such as investment in bike lanes and strong local agriculture.

CONCLUSION

Even the most optimistic emission scenarios predict dramatic

changes in the near future.² At the least, we must prepare for the effects on health—at home, by worsened heat waves and emerging pathogens such as *C. gattii*,²⁸ and globally, by the exacerbation of diseases with an already massive disease burden and worsening social inequity. Better yet, we can face the challenge of our generation and get a little fired up. 

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