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Advancing and implementing nutrition knowledge
to improve health, wellbeing and society

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Will climate change lead to global dietary change?

Throughout modern history, humankind has witnessed an amazing increase in food availability, resulting in theoretically higher levels of food security. Despite these advancements, the burden of malnutrition globally is still overwhelming: studies show that 822 million people are undernourished, and that undernutrition is linked with almost half of child mortality globally.¹ Inadequate access to food leads to metabolic stress and may result in multiple forms of malnutrition, namely child stunting and wasting, micronutrient deficiencies and overnutrition, often presenting in the same individuals at different stages of the life course.

There is no denying that food production, transportation, and consumption play a huge part in climate change. Of Earth's total ice-free land surface, 40% is used as cropland and pasture, and the conversion of traditional ecosystems to farmland is the largest factor threatening species' extinction.² Irrigation of food is the single largest human use of water, needing 66% of annual freshwater resources, while it is responsible for approximately 30% global greenhouse-gas emissions.^{3, 4} Additionally, excess nitrogen and phosphorus enrichment of soil instigates eutrophication and death of wildlife in lakes and coasts, which has a significant negative impact in marine ecosystems. All of this adds to the 'energetic cost' of food and the environmental impact of all of these steps (energy, water needed and greenhouse-gas emissions).⁵

Climate change also plays a major role in food systems and dietary availability. Two major global aims are to promote population wellbeing and environmental health, and these two goals must be compatible. Climate change has led to major weather events, failures in crop production, food insecurity, change in the nutritional composition of foods in the supply chain impacting dietary patterns, among other consequences. Evidence shows that these effects will be more pronounced for individuals living in low- and middle-income countries, contributing to the aggravation of current social inequities.^{6, 7}

Even though these interactions might seem obvious and very clear, poor health and nutrition insecurity is not one of the most commonly understood dangers of climate change.

The World faces three pandemics: obesity, undernutrition and climate change. Climate change is considered a pandemic because of its effects on the health of humans and the natural systems we depend on. Obesity, undernutrition and climate change can co-occur, interact and share common underlying social determinants. This synergy of epidemics represents a syndemic that affects most people globally.⁷

Projections predict a global population of 10 billion people by 2050. It will be a challenge to feed this population in a healthy manner, especially while facing growing constraints such as land provision, water, or fisheries.⁸ A recent study of global production concluded that if greenhouse-gas emissions continue along their current trajectory, vegetable and legume production could decrease by 35% by 2100 due to water shortage and amplified salinity.⁹ Corn production could be cut in half by a 4°C increase in global temperatures, which may occur by 2100. If temperature increase is kept under 2°C, the goal of the Paris climate accord, American corn production would possibly still decrease approximately 18%.¹⁰

KEY EVENTS

- **5th NNEdPro Cambridge Summer School in Applied Human Nutrition**
12-16 July 2020 | Homerton College, Cambridge, UK
- **6th International Summit**
17 July 2020 | Homerton College, Cambridge, UK

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So, what can we do and what is being done about this matter? The establishment of the United Nations' (UN) Decade for Action on Nutrition and the Millennium Development Goals led to a consensus statement that food systems must be improved. The UN's Sustainable Development Goals were also an international campaign that raised awareness for these matters, especially with the definition of the goals: 'Zero hunger', 'Good Health and Wellbeing', 'Clean Water and Sanitation', 'Sustainable Cities and Communities', 'Responsible Consumption and Production', 'Climate Action', and 'Life On Land'. These goals were important to reinforce the need to discuss climate change and health and use the results of these discussions to take action.¹¹

The best way to reduce the impact of climate change on food security would be reducing greenhouse-gas emissions throughout food systems and the implementation of effective climate adaptations.¹² Public health strategies that focus on promoting predominantly plant-based diets in line with evidence on healthy eating (not necessarily vegan or vegetarian) are a fitting approach for sustainable diets. It was estimated that increased consumption of plant-based diets might lower greenhouse-gas emissions by up to 80%.¹³ Of course, approaches regarding diet sustainability are context specific and can increase resource use in low-income countries. Sustainable diets are intended to address the increasing health and environmental concerns related to food production and consumption. Updating dietary guidelines could be an interesting way to communicate the latest evidence

on healthy eating and diminish environmental impacts. Usually, sustainable diets promote biodiversity and environmental protection, nutritional needs, wellbeing, fair-trade and cultural preservation, as recently described by Willett *et al.* (2019). Diets that are unsustainable for both health and environmental purposes are usually characterised as being high in calories, added sugars, saturated fats, processed foods, and red meat.⁸

These reports communicate various recommendations including the rise of sustainable and healthy cities, resilient health systems, reduced food wastage, and protection of ecosystems.

Transformative climate resilient pathways must be studied and debated, in order to achieve sustainable and healthy food systems and diets. In addition, the UN Decade of Action on Nutrition (2016-2025) is now complemented by the UN Decade of Action on Family Farming (2019-2028) and a newly launched UN Decade of Action on Sustainable Development (2020-2030); these three overlapping UN decades of action provide an integrated framework for action at all levels.

Hopefully this analysis can reverberate and be translated into action in kitchens, canteens, policy makers' offices, and our own plate. The intention is not to assume a prohibitive position, or to defend the idea that food production and diet will solve every problem climate change brings, but to highlight that both dimensions – food production/consumption and climate change – are unchangeably linked with natural systems and human health.

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