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Feeding a growing global population with healthy food from a sustainable planet

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Abstract



Food is fuelling several of the major global challenges of our time. Current food systems fail one in two people worldwide and poor diets are now the leading risk factor for disease, globally. Food systems also represent a significant driver of environmental degradation. Yet because food cross-cuts the major health, environmental and sustainable development challenges of today, bending the curve of unhealthy, unsustainable food provides one of the greatest

opportunities to achieve our Global Goals. Mounting research demonstrates the benefits of transforming our food systems, but a crucial next step is translating this research into action. This talk outlines some of the major linkages between food, people and the planet, and presents the coming EAT–*Lancet* Commission on Healthy Diets from Sustainable Food Systems as well as the *Lancet* Series on the Double Burden of Malnutrition. The former will synthesise the best available science to define what constitutes a healthy diet globally and what sustainable food production looks like that preserves functional ecosystems, and the latter outlines the important opportunities for integrated action on malnutrition in all its forms.

Healthy people from a healthy planet is my topic, and it is important to start by acknowledging some great successes that have resulted from our food systems over the last 100 years. There is some doom and gloom to come, but the take-home message of the last two centuries has been one of positive success.

- Since 1900, global average life expectancies have more than doubled across the planet, and to a large degree that has been because of our food systems and the food that they deliver.
- The proportion of people that go hungry every night has halved since 1969 alone; and
- Generation after generation we have seen incremental intergenerational increases in life expectancy, height and, of course, health.

We have had a food system that was largely focused on security and quantity. Now we are starting to transition to ask questions about quality. This is the next phase, because we are starting to look at the global burden of malnutrition currently across the planet. I have just finished three years with the World Health Organization (WHO) in Geneva, and I am very focused on addressing the global burden of malnutrition.

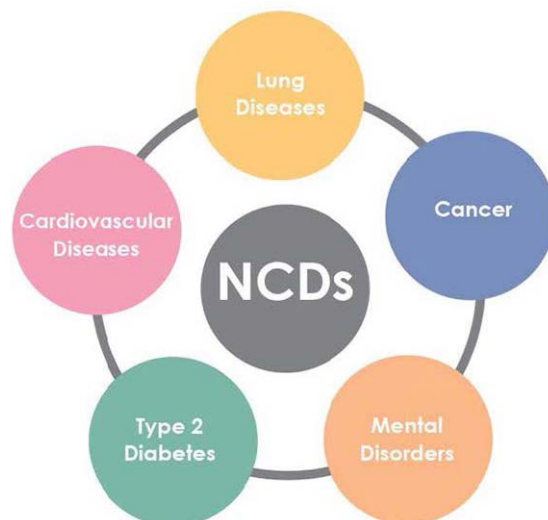
This paper has been prepared from a transcript and the illustrative slides of the presentation.

Food has been a great factor in extending life expectancies and improving qualities of life, and a major driver of economic and social development around the world. However, food also presents a major challenge.

- Two billion humans across the planet today are deficient in key vitamins and minerals, essential for their daily health.
- At the same time, more than two billion adults wake up every morning overweight or obese: around 600 million of them are obese.
- More than 800 million people go to bed every night hungry. Alarmingly the number that are hungry is once again rising, after decades of decreases. This rise is due largely to conflict and climate change.
- We know that 50 million children are wasted – that is, they are short, acutely hungry and thin for their age.
- Around 150 million children continue to be chronically undernourished, to the point that it permanently impairs their intellectual, social, biological and wider economic development. We know that a stunted child will expect to have an income that is roughly 20% less than that of their non-stunted counterparts by their second or third decade of life.
- And still 40 million children are overweight or obese and that number is increasing in almost every country across the planet and has no sign of reversing, let alone decreasing.

All in all, if you add that up, approximately half the planet is currently malnourished in some way, with 88% of countries facing a serious burden of either two or three forms of malnutrition. In summary, according to a 2017 Global Nutrition Report, the world is off-track to meet all its global nutrition targets.

In the 20th Century there were successes in eradicating many of the major infectious scourges; in addressing challenges to maternal, child and adolescent health; and in



(University College London 2014).

improving the security and quantity of food systems and the food that they produce. Those successes are now part of the reason why we see a total transformation in global epidemiology (that is, the study of the diseases that affect the planet). Now, noncommunicable diseases (NCDs) are the leading causes of death here in Australia and around the world:

diabetes, heart disease, cancer and chronic lung conditions, with mental illness as the often forgotten fifth. The United Nations is reconvening in September 2018 in New York for a High-Level Meeting to try and address this urgent and often overlooked – even ignored – global epidemic that causes seven in ten deaths in Australia.

We know that 80% of global diabetes and heart disease and a third of cancers are significantly delayable, to the point that we call them preventable.

Multiplying the burden

The global burden of malnutrition is made even more complicated by what is called a double burden of malnutrition (or sometimes a triple or multiple burden): that is, a coexistence of multiple forms of malnutrition in an individual, either at the same point in life, or across the life course.

For instance, a young child who is born into an environment, a country, a society where food is scarce, may actually be hungry for such a long period that it permanently hinders their physical, biological, economic and social development and, of course, their growth, through stunting. Then by their second or third decade of life they are living in an environment that looks more like ours – so called ‘obesogenic’: that is, Westernised food systems with prevalent junk foods and a food system that is delivering largely calorie-dense, nutrient-poor foods, from which obesity ensues, overlain on a short individual with underdeveloped organs that are at a greater risk of chronic disease.

Another major example, of course, is obesity coexisting with micronutrient deficiencies – a sad reflection of the global epidemic of nutrient-poor calorie-dense junk foods and the globalisation, commodification and Westernisation of our food systems and the food they supply.

At the same time our planet is also going through a major transformation. We are leaving the Holocene era in which humanity has thrived, and entering a new stage known as the Anthropocene. In this new epoch of history, humans exist at such a planetary scale that we are influencing the climate and the way the Earth’s systems function. We see this not just in scientific journals but also reflected as a major economic threat to our planet going forward as well.

Since about 1950 we have seen an unprecedented rise in human enterprise and socio-economic trends that are synchronous with an acceleration in the impact on the Earth’s systems (Figure 1). Not only are there increasing emissions (left side of Figure 1), there is also increasing deforestation, biosphere degradation, ocean acidification and many other impacts. As a human race, we are clearly making a major mark on the planet around us, and it is not always favourable.

The role of food

Over the last million years food has allowed us to grow larger brains and to develop more sophisticated cultures and, of course, come out of the caves. In the 20th Century food brought gains to life expectancies. We are now at a point in history where food is the single greatest threat to human health. Poor diets, globally and in Australia, are the single greatest risk factor for poor health and disease.

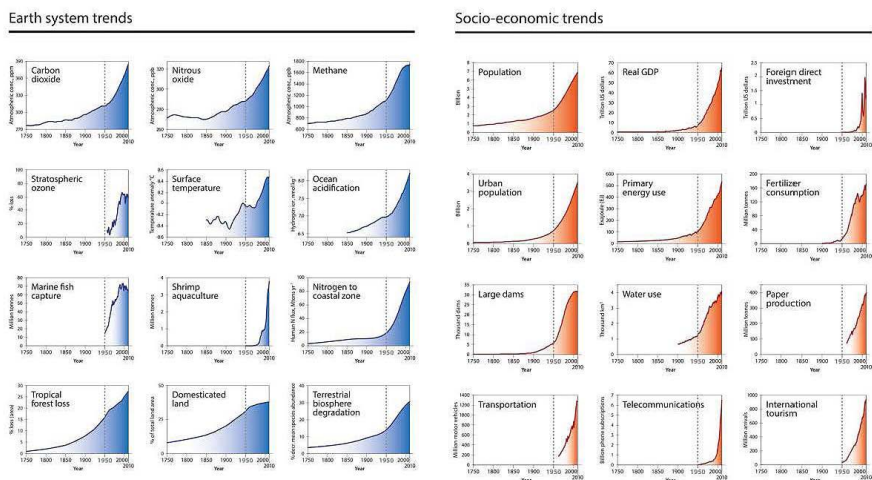


Figure 1. Earth-system & socio-economic trends in the Anthropocene (Steffen *et al.* 2015).

If we add up all the different risk factors, directly and indirectly affected by health in studies of the global burden of disease (e.g. Figure 2), we find that six of the top 11 risk factors are related to what we do, or do not, eat.

Although we understand what the world’s people should be eating, how we get people to *do* that is a completely different story and much more complicated. However, understanding what we *should* be eating is a great starting point. The World Health Organization (WHO) guidelines recommend:

- balanced energy intake;
- a diet rich in fruit, vegetables, legumes, nuts, whole grains;
- healthy fats, unsaturated fats, lower levels of saturated fat;
- eliminating trans fats, particularly processed trans fat, from the food system;

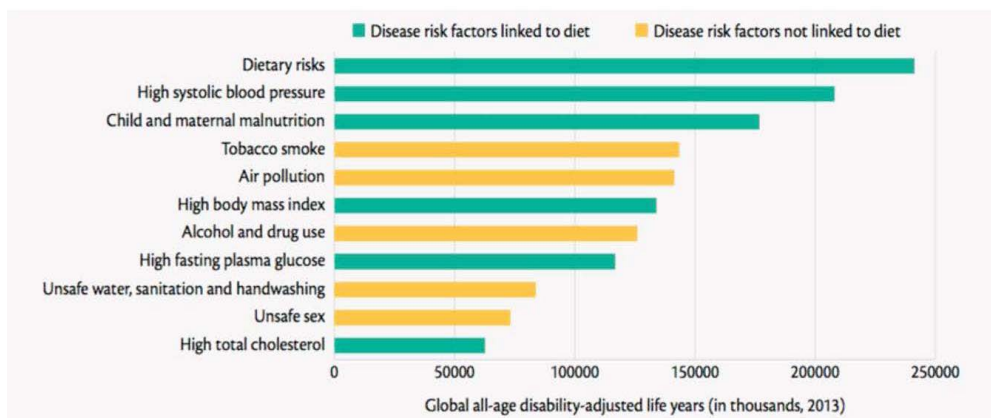


Figure 2. Food fails health. Global life years, disability-adjusted (DALYs) attributed to level 2 risk factors in 2013, both sexes combined (Global Burden of Disease Study 2013 Collaborators 2015).

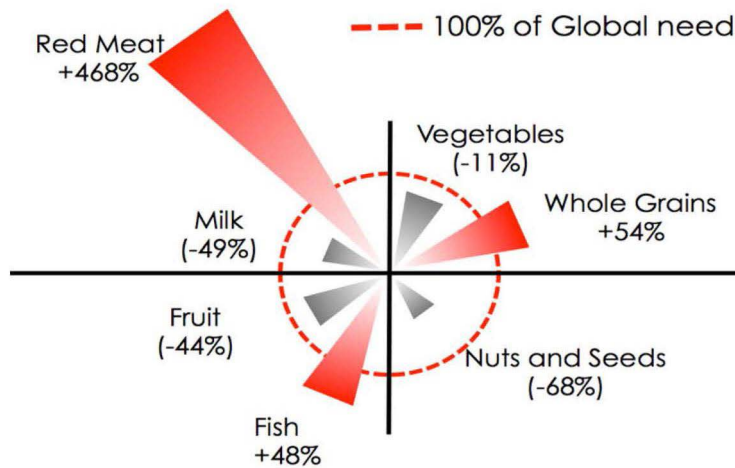


Figure 3. What we are producing (adapted from Murray (EAT 2014)).

- limiting our total free sugars to 10% or preferably 5%;
- reducing salt intake to less than 5 g/day.

Is this reflected in the food that we are actually producing? The short answer is, 'No' (Figure 3).

We are producing far more meat than the planet needs, with major ecological consequences. At the same time, the evidence suggests that we are producing far less fruit and vegetables than we need. Billions of people need to be eating more animal-source proteins, but much of the rich world needs to eat much, much less. How can we balance these two? How do we close this important gap?

Food systems are not just responsible for health challenges. Our food sector is the single greatest contributor to global greenhouse-gas-related emissions: more than 25% or almost 30% of human-produced greenhouse gases now come from our food systems. Our food systems are a major cause of disruption of flows of nutrients, including nitrogen and phosphorus which are very important in Australia in relation to total pollution. And food systems use 70% of fresh water and affect biodiversity loss and land degradation.

Although it is a great challenge for humanity to get our food systems aligned with people's priorities and long-term planetary health, food also offers incredible opportunity. Food is so central to today's major health, environmental and developmental challenges that we have a great opportunity to bring humanity back on track towards meeting the global development targets, the Sustainable Development Goals (SDGs), by 2030. Recent evidence suggests how this can be done.

Food can fix it

Changing meat consumption and changing production practices are probably the best levers we can use to reverse or avoid the health and environmental effects of consumption (e.g. Poore & Nemecek 2018).

At the same time, while there is a fixation on reducing consumption of a handful of species, we often fail to recognise the thousands of edible plants and animal species that could be included in a plant-forward future. Including such species would also be a pathway to protecting biodiversity and the richness of our ecosystems.

We also see that food is an incredible opportunity for win–wins across that double burden of malnutrition.

- We know that early nutrition and food in the first thousand days of life are critical to long-term health, to setting a child and an adult up for health across their life course.
- We know that breastfeeding and protecting and promoting exclusive breastfeeding and appropriate complementary feeding are probably the two most critical things that we can do to allow an individual the healthiest life possible.
- We know we should be promoting a healthy diet that is based as much on quality as it is on quantity.

The SDGs that were outlined in 2015 are comprehensive and complicated to the point that they often seem paralysing. But food systems also offer great opportunities for integrating actions, for integrating impact across the full spectrum of the goals and the many sub-targets. Whether it is ocean sustainability, whether it is partnerships for the global goals, whether it is poverty or hunger or wellbeing and health, food is critical to all of those. Food is a great driver for achieving multiple global targets all at once.

With less than 13 years to achieve the SDGs, for most countries food and food systems provide unprecedented opportunities for achieving win–win outcomes.

Major scientific outputs imminent

I want to draw attention to two major scientific outputs that we can expect to see in early 2019 that EAT is involved in. **The first output** (box below) is a *Lancet* series on the double burden of malnutrition, co-hosted by the WHO and our colleagues at the Food & Agriculture Organization of the United Nations (FAO).

This will focus on four papers and really try to clarify, in a confusing landscape of multiple forms of malnutrition, the opportunities that lie in addressing the double burden of malnutrition.

Lancet series on the double burden

Paper 1: Global nutrition transitions and the double burden (epidemiological).

Paper 2: New biological pathways in malnutrition (biological).

Paper 3: Double-duty actions for nutrition (policy).

Paper 4: Economics of inaction in the double burden of malnutrition (economic).

There are opportunities for using so-called ‘double duty actions’ to address forms of undernutrition at the same time as addressing overweight and obesity. Some of these are well known, such as breastfeeding, and some involve integrating other forms of malnutrition into the work that we are already doing.

For instance, we worked with the World Food Programme, delivering breakfasts to millions of children every day. Of course, that breakfast very often was a juice box and a muffin or bread roll. Integrating a healthy diet into humanitarian responses is a great example of retrofitting an existing opportunity for a double duty action on nutrition.

We are going to need to develop new types of responses: new opportunities, new initiatives that, at their outset, acknowledge that we live in this very complicated age where hunger can coexist with obesity in the same household, in the same community, in the same country. We need solutions for policy makers that will address both – and quickly.

The second major output is the EAT–*Lancet* Commission. It is led by the organisation I lead in Norway. Many of the Commissioners are in this audience today, and I feel a bit cheeky speaking about it when two of our Commissioners are also among today’s speakers.

The EAT–*Lancet* Commission brought together 30 world experts from across the spectrum of science, multilateral systems, environment and health. The core question was: How do we feed nearly 10 billion people by mid-century with a healthy diet that is produced sustainably? The Commission was co-chaired by the two gentlemen in the photo below: Professor Walter Willard of the Harvard School of Public Health and Johan Rockström of the Stockholm Resilience Centre.



Professor Walter Willard
and Johan Rockström.

The discussion took in two non-negotiable hard biophysical boundaries (Figure 4). On the one hand, environmental targets were developed taking an Earth’s system approach and looking at global regulatory flows that are impacted by food production.

On the other hand, for health targets defined by healthy eating patterns, the Commission took a nutrient-based and food-based approach. It uses recommended ranges of intakes as well as recommendations for the food system that will provide it. Here, the *right diet* emphasises ‘not too little, not too much’ and, of course, ‘the right quality and just enough calories to protect human health’.



Figure 4. A safe operating space for food.

Although we have these two hard boundaries – human dietary requirements and planetary boundaries – there is a lot that can be done in the middle, and that is where the Commission mainly focused. For example: What can be done to reduce waste; to intensify agriculture sustainably; to protect and safeguard our oceans and our soil; and to shift populations to healthy diets?

We know that many diets transgress both boundaries: the so-called lose–lose diets. Other diets might be healthy but not sustainable, or sustainable but not healthy. We need to have diets in the safe operating space, meaning that they are a win–win diet for people and the planet: that is, in the bottom right part of Figure 5.

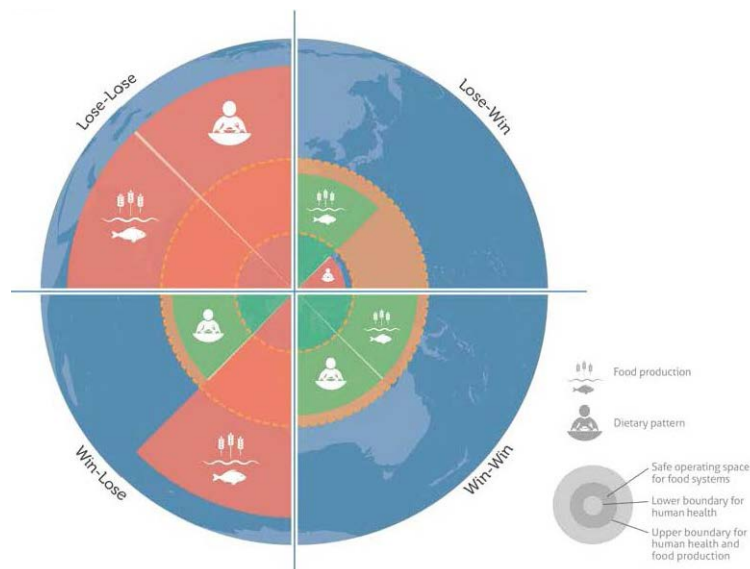


Figure 5. Achieving win–win diets.

In addition, the EAT–*Lancet* Commission will identify five key strategies that will help create this transition to win–win diets. These are to:

- shift a population to healthy, tasty and sustainable diets;
- realign food system priorities for people and planet;
- produce more food from less;
- safeguard our land and oceans; and
- radically reduce food loss and waste by 50% by mid-century.

Of course, the Commission is going to generate more questions than answers and this is what we would expect. So the next step for us at *this* conference today, and for the global community, and for us at EAT, is to tackle the following tough questions:

- How can trade contribute to continue healthy, sustainable and prosperous food systems?
- How do you engage people and companies in change when it means eating new foods, producing new outputs and adopting new business models?
- How do we navigate, understand and manage the fact that there will be trade-offs – that there will be those that lose in some way from this new future where planet and people are in fact protected?
- How do we use food systems change to empower women and drive gender equality?
- How do we use food systems to achieve our 2030 goal of leaving no one behind?

This last question is very important because, as I said at the beginning, our current food systems result in half the planet being malnourished, and if we are going to get anywhere close to achieving the SDGs by 2030, with a prosperous planet and population living on it, we need to get to a point where our food systems are providing diets that, indeed, leave no-one behind.

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Sandro trained and worked as a medical doctor at The Alfred Hospital in Australia. While practising as a doctor he completed a Master in Public Health including fieldwork in Cambodia. In 2010, he relocated to Denmark where he completed a PhD with the University of Copenhagen, focusing on noncommunicable diseases. His doctoral research was based in Mongolia, working with the Ministry of Health. He designed, led and reported a national epidemiological survey, sampling more than 3500 households. Sandro held a Postdoctoral Fellowship at Harvard Medical School from 2013 to 2015, and was assistant professor and course director in global health at the Copenhagen School of Global Health in Denmark. He also established and led the *PLOS* blog 'Global Health'. From November 2015 until April 2018, Sandro was Medical Officer for noncommunicable conditions and nutrition with the Department of Nutrition for Health and Development at the global headquarters of the World Health Organization. In April 2018, Sandro became Chief Executive Officer of EAT: the science-based, global platform for food systems transformation. In his pro bono work, Dr Demaio co-founded NCDFREE, a global social movement against noncommunicable diseases using social media, short film and leadership events – reaching more than 2.5 million people in its first 18 months. In 2015, he founded 'festival21', assembling and leading a team of knowledge leaders in staging a massive and unprecedented free celebration of community, food, culture and future in his hometown Melbourne. Then in 2018 and funded through his media work with ABC TV and Pan MacMillan publishers, Sandro established an independent, not-for-profit foundation focused on improving the health and nutrition of Australians. Dr Demaio currently co-hosts the ABC television show *Ask the Doctor* – an innovative and exploratory factual medical series broadcasting weekly across Australia. To date, he has published 30 scientific papers and more than 90 articles. He is also the author of *The Doctor's Diet*, a cookbook based on science and inspired by a love of good food. Sandro is fascinated by systems-innovation and leadership; impact in a post-democracy; and externality-driven disease.