

# Climate Change, Crop Yields, and Undernutrition, with Sari Kovats

With more than 1 billion people estimated to not have enough to eat, food security is a pervasive problem. An estimated one-third of the global burden of disease afflicting children under the age of 5 is caused by undernutrition. Climate change is anticipated to reduce cereal yields, further threatening food security and potentially increasing child undernutrition. In this podcast, host Ashley Ahearn discusses the connection between climate change and undernutrition with researcher Sari Kovats.

## Ashley Ahearn

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It's *The Researcher's Perspective*. I'm Ashley Ahearn.

This year the global population is expected to hit 7 billion.<sup>1</sup> More than a billion of those people will not have enough food to eat.<sup>2</sup> And that has very real effects on human health.

Already, an estimated one-third of the global burden of disease<sup>3</sup> afflicting children under the age of 5 is caused by undernutrition.<sup>4</sup>

Now factor in climate change, and the forecast for the future isn't looking good.

Dr. Sari Kovats is a senior lecturer in the Department of Social and Environmental Research at the London School of Hygiene & Tropical Medicine. She coauthored an article in *EHP* titled "Climate Change, Crop Yields, and Undernutrition,"<sup>5</sup> and she joins me now by phone to talk about it.

Hi, Dr. Kovats.

**KOVATS:** Hi, Ashley.

**AHEARN:** Dr. Kovats, tell me a little bit about the kind of information you were bringing together in this report and what were you focusing on.

**KOVATS:** We're very interested in trying to quantify possible health impacts of global climate change. It was a major gap—there weren't any good models looking at health effects via changes in undernutrition. But what we do have, or what other groups have done, is model the impacts of climate change on crop yields, cereal crop yields. And so what this paper does is essentially link models that have quantified the impact of climate change on crop yields to another model that's looked at food trade, global food trade, that then estimates food availability in a country. And then what our model does is link food availability to rates of malnutrition and in that complex chain of events we've come up with some estimates about the impact of climate change on child health in terms of stunting, which is a measure of child ill health.

**AHEARN:** Tell me a little bit more about that. What is stunting, exactly?

**KOVATS:** So, stunting is a measure of chronic malnutrition or chronic lack of food, and there are several studies that have linked stunting to adverse outcomes. So, a stunted person or child has a much higher mortality risk and a much higher risk of other infectious diseases such as diarrhea or malaria, and they also can lose IQ points, and they basically have an impact over their long-term survival and their long-term earning capacity as well.

**AHEARN:** In your report, you and your coauthors developed a model that predicted rates of stunting around the world. Tell me, what did your model show?

**KOVATS:** So, what we've done is we've taken very likely scenarios of future worlds, so fairly high rates of economic growth, which you could argue are quite optimistic: the UN projections of population growth and sort of medium-high projections of emissions. So they're all kind of likely things that could occur—we're not saying they *will* occur—and we've quantified appreciable increases in stunting, particularly severe stunting, in five

regions in the world for future time periods. We've basically compared a future with climate change and a future without climate change, but both futures had the same population growth and the same economic development.

This model shows that there is an appreciable effect of climate change on stunting rates, so on child health, despite positive and optimistic scenarios of economic growth. So what we haven't done here is modeled poor economic growth or stagnation or economic crisis, and we haven't also modeled very severe impacts of climate change, which are also possible. So it's not a worst-case scenario, it's actually quite an optimistic view of the world, and yet still it tells us we really need to prepare for climate change impacts.

And of course these impacts are concentrated in the poorer countries, where there's already a high burden of malnutrition.

**AHEARN:** Right, your model focused mainly on South Asia and Africa, is that right?

**KOVATS:** It focused only on South Asia and Africa because that's really where all the malnutrition is.

**AHEARN:** Dr. Kovats, what are the future questions you'd like to be answering in your research or areas you'd like to explore?

**KOVATS:** Well, obviously we'd like to have better understanding between the environmental, the climate, and the social determinants of malnutrition sort of at the household level and at the country level. There's lots of work to be done elucidating that and determining the factors that make households resilient to climate variability or to climate impacts, you know, which would primarily be felt through things like extreme [weather] events. And then because the food systems are very globalized there also needs to be a lot of modeling understanding about how climate effects in one place may affect food availability and food prices in other countries.

So, it's really a case of looking at the environmental and the climate and the social and the economic determinants of food security and providing estimates that are more relevant for decision making.

**AHEARN:** Dr. Kovats, thanks so much for joining me.

**KOVATS:** Thank you.

Dr. Sari Kovats is a senior lecturer in the Department of Social and Environmental Research at the London School of Hygiene & Tropical Medicine.

And that's *The Researcher's Perspective*. I'm Ashley Ahearn. Thanks for downloading!

## References and Notes

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<sup>1</sup> UN DESA. *World Population Prospects, the 2010 Revision*—Frequently Asked Questions [website]. New York, NY:United Nations, Department of Economic and Social Affairs, Population Division (updated 14 Oct 2011). Available: <http://esa.un.org/unpd/wpp/Other-Information/faq.htm> [accessed 31 Oct 2011].

<sup>2</sup> FAO. *State of food insecurity in the world: economic crises—impacts and lessons learned*. Rome, Italy:Food and Agricultural Organization of the United Nations (2009).

<sup>3</sup> The World Health Organization describes burden of disease as a “time-based measure [that] combines years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health.” Essentially, burden of disease is an estimate of the extent to which disease adversely impacts the lives of people in a given population.

<sup>4</sup> Black RE, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet* 371(9608):243–260 (2008).

<sup>5</sup> Lloyd SJ, et al. Climate change, crop yields, and undernutrition: development of a model to quantify the impact of climate scenarios on child undernutrition. *Environ Health Perspect*; <http://dx.doi.org/10.1289/ehp.1003311> [online 15 Aug 2011].

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