Hunger Clock Blog

A Global Picture of Food Insecurity

Food insecurity has been increasing for the past several years, and has been recently further exacerbated by the coronavirus [1]. But what can we expect for the next decade? What will current trends in climate change, economic growth, and demographic shifts mean for food security throughout the 2020s?

For the past few years, Gallup World Poll and the FAO have been conducting surveys around the world, asking people about their experiences of hunger. Questions about skipping meals, running out of food, and worrying about having enough to eat capture the human, experiential side of hunger and food insecurity.

With this data, the World Data Lab has used machine learning and the latest forecasts of global change to estimate how global dynamics of food insecurity are expected to change in the coming decade.

The Experience of Food Insecurity

Scientists have been studying food security for decades, and for many years, they relied on crude metrics, such as food available per-capita, or the rate of stunting among children. However, these methods come with a variety of problems. Looking at the amount of food stored in national reserves doesnt account for inequalities in access to that food, while population level metrics like rates of stunting are also affected by things like infectious disease and parasties.

Thus, since the early 2000s, food security practitioners have been developing new tools to measure hunger. These tools measure food insecurity at an individual level, and take into account peoples lived experiences of food insecurity - going hunger and worrying about food - rather than just crude proxies for hunger. By the 2010s, the Food Insecurity Experience Scale (FIES) as one of the most informative and cross-culturally valid metrics of food insecurity, and has been monitored in countries around the world since the 2014. It was selected as one of the key indicators for the second Sustainable Development Goal of Zero Hunger.

[1] http://www.fao.org/3/ca9692en/online/ca9692en.html

Modeling Food Insecurity

We used data from several published studies that had subnational predictions of how things like wealth, education, demographics, urbanization, and the weather are expected to change over the coming years. Based on these variables, we used machine learning to estimate how all of these things relate to the levels of food insecurity. Our model was able to predict rates of food insecurity with very high accuracy (r-squared = 0.99), meaning that is is possible to infer food security level based on all of the variables we had data on. Finally, based on how those variables are likely to change in the coming years, we've estimated future rates of food insecurity.

These predictions are based on a big caveat: our data is based on the assumption that current trends continue as expected. In many cases this is a reasonable assumption. For example, demographic patterns are easy to anticipate - we know with certainty that people aged 20 in the year 2020 will by 30 years old by 2030. Similarly, patterns of urbanization and economic growth have been increasing for decades and will likely continue on their current path through to 2030. Nevertheless, as the coronovirus illustrated, there are always "black swan" events that no model can anticipate. Our model shows the best estimate that we can make with the information that we have available at the present.

Where Thing Are Getting Worse and Where They Are Getting Better

We used our model to predict both moderate food insecurity - eating less than you would like, as well as severe food insecurity - going an entire day without eating. The figure below shows our results, broken down by world region. On the whole, in recent years, both moderate and severe food insecurity have been on the rise in terms of absolute numbers. Due to the impact of the coronavirus on the global food system, 2020 and 2021 will see the highest levels of hunger in over a decade. Today, nearly 2.5 billion people - almost a full third of the world's population - have some level of hunger, due to lacking the resources to purchase the food they would like, while 800,000 people are severely food insecurity, going an entire day without eating at least once in the previous year.

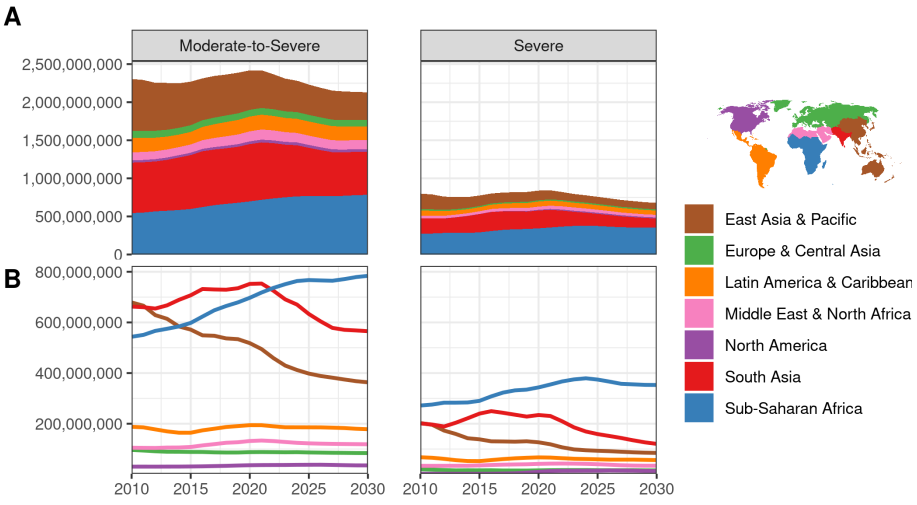

Figure 1: Number of people with moderate and severe food insecurity, broken down by world region