

Q&A: To protect human health, we must protect the Earth's health

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Human activities have transformed and degraded Earth's natural systems. But it's not just the planet that endures the harms of things like pollution and climate change. Changes like rising ocean temperatures and CO₂

levels have cascading effects that threaten the future of humans.

In this Q&A, adapted from the [April 22 episode of Public Health On Call](#), Joshua Sharfstein, MD, talks with Sam Myers, MD, faculty director of the new Johns Hopkins Institute for Planetary Health and founding director of the Planetary Health Alliance, about this [interdisciplinary approach](#) to understanding how the state of the planet impacts human health and well-being.

What is planetary health?

Planetary health is a cross-disciplinary field that has emerged in the last eight or nine years. It focuses on how our transformation of nature—our degradation and alteration of all of our planet's natural systems—is coming back to affect our health.

Climate change, biodiversity loss, global-scale pollution of air, water, and soil, changes in [land use](#) and land cover—all driven by human activity—are resulting in increased burdens of disease and impacting all dimensions of human health. We want to understand what those dynamics are and how we can address them.

What are some examples of changes impacting human health?

We know that ocean warming is changing the size of both fish and fisheries. It's also changing where the fisheries are located, moving them away from the tropics and toward the poles. We did a study to determine how many people depend on wild-harvested fish for critical nutrients and live close to a threshold of insufficient intake of those nutrients—what we define as the vulnerable population to these changes. We found that over a billion people fall into this category.

We've also found that crops like rice, wheat, and maize—foods that provide most of the calories in the global diet—tend to lose essential nutrients when grown at elevated concentrations of carbon dioxide like the ones we expect to see by about the middle of this century.

In our [free air carbon dioxide enrichment \(FACE\) experiments](#), we grew 41 cultivars of those kinds of crops in seven locations across three continents over 10 years. We found that growing these staple food crops at high CO₂ levels significantly reduces the amount of iron, zinc, and protein they contain.

We then modeled what these findings would mean for populations in 150 countries and found that the CO₂ effect alone would cause around 150–200 million people to be pushed into nutritional insufficiency of these nutrients.

Other research has shown that growing different cultivars of rice at elevated CO₂ resulted in B vitamins being reduced by almost 30%. We used that data to model what that might mean for the risk of things like neural tube defects, and we found really large impacts.

What other environmental factors does planetary health consider?

Changing levels of CO₂ in the atmosphere is just one very specific biophysical change, but we're changing all the biophysical conditions that our entire food production system has been developed to be optimized for: temperature, precipitation, amount of arable land, pollinators, and pest and pathogen relationships.

All of those things are now changing in response to human activity in ways that usually represent headwinds for global food production, in

terms of both quality and quantity.

How does planetary health address the extreme scale of the changes humans are causing the environment and the consequences of those?

The field of planetary health has emerged out of a recognition that the pace and scale at which we're transforming all our natural systems has become a [global health crisis](#).

The global health impacts of the Earth crisis are kind of a silent pandemic, and there are parallels to the COVID pandemic we've just come out of. The COVID pandemic required massive mobilization of new technologies, investments in economic stimulus and foreign assistance, respect for science, and urgent global behavior change. This silent pandemic is probably much more impactful to human health. It could be addressed in a very similar way, but we're doing very little.

You can't respond to a crisis until you recognize that there is a crisis. As you are trying to raise concern over planetary health, how is that warning signal being received?

The field is growing very quickly. We started the [Planetary Health Alliance](#) about eight years ago, and we now have more than 400 organizations involved in more than 70 countries. There's been a very rapid proliferation of new courses, degree programs, and journals in planetary health. We're also seeing [government agencies](#) adopting planetary health as a frame, including the European Union, certain national governments, and the UN system.

There has been a rapid understanding and recognition of the global health urgency related to the Earth crisis, but it's a drop in the bucket of what is really needed to fully mobilize and address the crisis.

Are there solutions that can address multiple problems at once?

Yes. From a policy standpoint, the goal is to find opportunities to both optimize human health and well-being and reduce our ecological footprint. In order to protect and regenerate the Earth's natural life support systems, we have to change the way we're living. The good news is there are a lot of ways we can do this, and many of these changes also have major co-benefits.

For example, switching to clean, renewable energy is important to addressing [climate change](#). Doing so also reduces the amount of air pollution, which drives something like 9 million deaths every year. Greening our cities and designing them to be walkable and bikeable not only reduces greenhouse gases and increases biodiversity; these changes also provide major mental and physical health benefits.

What is the Planetary Health Alliance and what does it do?

Contrary to what it sounds like, the Planetary Health Alliance doesn't fight for the planet's health—they're fighting for human health and the health of other species.

It's a recognition that the well-being of all life on earth depends on stable natural life support systems. Things like degradation of biodiversity, pollution, and land use change all interact with each other in very complex ways that affect these foundational conditions for all life on Earth:

- The quality of air that we breathe.
- The quality of water that we consume.

- The quality and quantity of food we can produce.
- Exposure to infectious disease and extreme weather events.

And these impacts are driving an urgent set of health problems.

The Alliance functions as sort of the backbone organization for this growing global field. That includes curating new knowledge, writing the first textbook for the field, developing core competencies for education, creating a platform to support educators and planetary health around the world, organizing an annual meeting, and putting out a newsletter.

One half of the Alliance's focus is to create and support a global community of practice. The other half is what we call "mainstreaming planetary health," which means taking that community of practice, the new knowledge, and conceptual frameworks out of the field and connecting them to action.

We're working to ensure that policymakers, the private sector, and the general public are aware that the Earth crisis now represents a humanitarian crisis and that there are a variety of solutions that benefit both people and the planet.

Tell us about the Planetary Health Institute you've started at Johns Hopkins

The Institute is the first example of a major university using planetary health as a lens to bring faculty and students together across all of its schools and centers. The Institute is bringing together people in the arts and humanities, engineers, natural scientists, and people in government, law, and policy around this central project of planetary health.

We'll focus on research, education, policy, practice, and clinical

programs. And already, there are all kinds of interesting interdisciplinary initiatives at Hopkins that are focused on planetary health: One on planetary health cities, one on Indigenous health, and another one on food systems, just to name a few.

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