Health, Science, Faith, and Stewardship: A Winning Combination

2017 was an auspicious year for those who care about the health implications of climate change—in both worrisome and positive ways.

It was a catastrophic year. Temperatures rose to unprecedented levels in places across the world. Unprecedented wildfires ravaged vast expanses of land from California to Portugal. Hurricane Harvey brought unprecedented rainfall and flooding to Texas, and was quickly followed by Hurricane Irma, the strongest Atlantic Ocean storm ever recorded outside of the Caribbean and the Gulf of Mexico. Montana and Idaho fell prey to unprecedented drought, just as, across the world, large parts of east Africa were enduring their second year of—that's right—unprecedented drought.

In the paragraph you just finished reading, we used the word "unprecedented" over and over. (Our English teachers would complain!) But we did this intentionally. Climate conditions are now routinely breaking records. There is no precedent for current realities. What used to be 500- or 100-year events now occur every few years. People the world over are suffering as a result.

But 2017 was an auspicious year in positive ways as well. The global fight against climate change advanced. Here we celebrate three such advances, seemingly quite distinct, but related, we contend, in fundamental ways: the publication of the Lancet Countdown's inaugural report, the emergence of the field of Planetary Health, and the Pontifical Academy of Sciences' declaration on "Health of People, Health of Planet and Our Responsibility."

The **Lancet Countdown** evolved out of the 2015 Lancet Commission on Health and Climate Change,[1] which recommended, among other things, a rapid acceleration of investments in "climate change and public health research, monitoring, and surveillance to ensure a better understanding of the adaptation needs and the potential health co-benefits of climate mitigation at the local and national level," and committed to a collaborative effort in "tracking, supporting, and communicating progress and success along a range of indicators in global health and climate change." From this, 24 academic institutions and UN agencies from six continents formed the "Lancet Countdown: Tracking Progress On Health and Climate Change," which published its framework document in 2016[2] and its first report in 2017.[3] The report presented a total of 40 indicators in five categories: Climate change impacts, exposures, and vulnerability; Adaptation planning and resilience for health; Mitigation actions and health co-benefits; Economics and finance; and Public and political engagement. The indicators, and the methodology behind them, are available not only in the published papers but on the web, at www.lancetcountdown.org.

While most of the Countdown findings were consistent with well-recognized patterns, there were a few surprises. For example, Indicator 1.3 suggested that global labor capacity in rural populations exposed to temperature change had decreased by 5.3% between 2000 and 2016, with a dramatic decrease of more than 2% between 2015 and 2016. Overall the Countdown data yielded four core messages: that climate change unequivocally threatens health, with no country immune to its effects; that 30 years of a delayed response has amplified this threat, with definitive intervention now urgent; that health professionals have an essential role to play; and that recent "glimmers of hope" over the last five years give some cause for optimism. Perhaps the greatest significance of the Countdown is that it aggregates, for the first time, a suite of indicators on climate change and health, including risks, health impacts, adaptation and mitigation (or preparedness and prevention) actions, financial and policy implications.

Such systematic tracking of data is a time-honored and essential public health function[4] and represents a major step forward in the global response to climate change.

Planetary Health as a field grew out of long-standing frameworks such as EcoHealth, One Health, Conservation Medicine, and others.[5] Its intellectual foundations included the recognition of profound planetary changes, enough to define a new geological epoch, the Anthropocene,[6] and the idea that certain planetary limits, if transgressed, could pose grave threats to ecological balance and to human civilization.[7,8] Planetary Health was first proposed in a 2014 "manifesto" in *The Lancet*,[9] which articulated a vision of "a planet that nourishes and sustains the diversity of life with which we coexist and on which we depend," and its foundational document, a Lancet Commission report, was published a year later.[10] That report asserted that "the structure and function of the Earth's natural systems represent a growing threat to human health," defined planetary health as "the health of human civilization and the state of the natural systems on which it depends," and called for a new science—one that is synthetic, systems-based, and applied.

A key feature of Planetary Health is its holistic approach. It addresses a range of planetary changes, not only climate change but also changes in nitrogen and phosphorus cycling, in land use patterns, and in hydrological patterns, biodiversity loss, ocean acidification, environmental loading with chemicals, and urbanization. It is solution-oriented, driving toward agriculture, energy generation, manufacturing, transportation, urban design, and behavioral choices that are healthy, sustainable, and equitable.

With support from the Rockefeller Foundation and the Wellcome Trust, the field of Planetary Health has advanced rapidly, with 2017 being a landmark year. Two important journals, *Lancet Planetary Health* and *GeoHealth*, debuted, and the Planetary Health Alliance (planetaryhealthalliance.org) held a highly successful first annual meeting in Boston. The emergence of this field represents a second major step forward in the global response to planetary change.

Under Pope Francis, the Catholic Church, with its 1.2 billion adherents worldwide, has addressed the twin problems of environmental degradation and social inequity with vigor. The 2015 release of the papal encyclical, *Laudato Si, On Care for Our Common Home*,[11] expressed a powerful commitment to social justice and environmental sustainability. This engagement with ecological principles and sustainability signals, according to one account,[12] a new phase of the Church's historical relationship with science, following the eras of its responses to the rise of astronomy and physics (16th - 18th centuries), geology and evolutionary theory (19th - early 20th centuries), and rapid technological advances (mid- to late 20th century). The implications for public opinion and policy are not fully understood. While some religious positions, especially the Church's position on population, have impeded progress,[13,14] there is evidence that a faith-based framework,[15] and the teachings of Pope Francis in particular,[16] propel a moral response to climate change.

It was against that background that the **Pontifical Academy of Sciences** hosted a meeting in early November, 2017, to address the combination of climate change, pollution, and health. The meeting produced a bold Declaration (http://www.pas.va/content/accademia/en/events/2017/health/declaration.html) that was signed by dozens of scientists, including many members of the Pontifical Academy and many Nobel laureates. The Declaration states unequivocally that "Climate change caused by fossil fuels and other human activities poses an existential threat to Homo sapiens and contributes to mass extinction of species," and calls for a range of responses, including decarbonizing the world's energy systems, support by rich countries of

climate change adaptation efforts in poor countries, ending deforestation and land degradation, placing health at the center of climate policies, and implementing both the Sustainable Development Goals and the Paris Climate Agreement. This high-profile fusion of science and faith is a third major step forward in the global response to planetary change.[17]

Each of these milestones, and the initiatives they represent—carefully tracking the health impacts of climate change and global efforts to respond; building a scientific paradigm that blends the health of humans with the health of the planet; and aligning science and faith in crafting equitable solutions—is not only significant, it is essential. While a publication, an innovative scientific framework, and a religious declaration do not in and of themselves represent action—2017 also brought a global increase in carbon dioxide emissions, reversing a three-year trend[18]—they are clearly positive indicators. Each of these is needed to propel the transition to a world that is healthy, just, and sustainable. At a time when optimism can seem elusive, 2017 was a year that gave real reason for hope.

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