Climate change and public health: an inevitable convergence in light of the Coronavirus

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“There cannot be a debate on climate change without a meaningful conversation about public health.” (Hollis, A. Climate change isn’t just a global threat – it’s a Public Health Emergency, September 2019).
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Introduction

The President of the United States claimed that the 2019-nCoV (“Coronavirus” or “Covid 19” as known more generally) would disappear from North American with the advent of the summer and higher temperatures. This statement was poorly thought out and unsubstantiated by science and what is known about this virus. However, it paradoxically places on the agenda for Latin America and the world in general, an absolutely critical issue: the complex and poorly understood relation between climate change and public health.

Without a doubt, Covid 19 has transformed the world in one week. Changes that take decades to become visualized are occurring before right in front of us. Apart from the health crisis we face as a result of the virulence and high contagiousness of Covid 19, its social, economic and cultural impacts have everyone on edge. The stock exchange collapse, increase of unemployment, extreme “social distancing” measures, xenophobic speeches linked to the origin of Covid 19, the incapacity for a coordinated international response, multiple prescriptions and “magic” medications to face the virus and the expectations of a growing economic depression worldwide, constitute a unique occurrence in history we are “privileged” to witness in real time and feel first hand.

At the same time, in the midst of news turmoil and day to day urgencies, debates on how climatic patterns and human actions may exacerbate the appearance and dissemination of diseases such as Covid 19 are marginal. In this short essay, we will try to present some related ideas on the complex relationship between climate change, human action and public health, in light of the Covid 19 crisis.
On the effects of climate change on biodiversity, vectors and diseases in general

Over recent decades, mainly in the context of research and efforts to eradicate and mitigate tropical diseases, we have started to better understand the role of climate and higher temperatures in their propagation, transmission, virulence and endemism. Although the relationships are not causal and linear, it can be affirmed with some certainty, that climate change can play a key role as a factor in the propagation and transmission of some contagious diseases.

Studies undertaken on Malaria, Dengue, Leishmaniasis, Chagas disease and Tuberculosis have helped significantly to understand how higher temperatures favor disease-transmitting vectors, mainly mosquitoes (anopheles), to perpetuate and extend their presence and enhance extensive transmission of disease. The destruction of habitats and continuous human destruction and alteration of tropical and subtropical forests and ecosystems, also contributes to disease vectors interacting with human populations. These populations are particularly vulnerable due to their poverty levels, marginalization and limited access to formal health services.

Apart from these viral diseases, there are others with high mortality levels such as Ebola, Hanta, Marburg, HIV and Influenza, whose origin can be traced both to habitat alterations (generally tropical ecosystems) and conscious or casual human interaction with wildlife, especially wild mammals that are carriers of many of these viruses. For example, Ebola is associated to the consumption of primates in some areas of Central Africa; the Hanta virus to the exposure of rodent excrement in States such as Arizona, Utah, New Mexico in U.S.A.; the Marburg disease to the exposure of primates and Covid 19, preliminarily thought to origin in the consumption of bats in China, in traditional foods following cultural practices. It is also suspected that the “pangolin”, an animal species in danger of extinction from Java, Indonesia, but appreciated in China for its alleged medicinal properties, may be the origin of Covid 19.

Continuous deforestation, mainly of tropical forests, also causing the accumulation of greenhouse gasses and consequent global warming and alteration of resulting ecosystems, has possibly exacerbated changes and mutations in virus and bacteria, making them difficult to combat with drugs and the currently existing arsenal of medicines.

Unlike certain viruses such as the common influenza, for which the immune system has answers by “recognizing” it, certain viruses that originally were only transmitted among animals and are innocuous to them, for example Ebola or Hanta, mutate and infect human beings directly through the consumption and exposure to animals or their sub products, initiating a more or less virulent spreading stage or transmission, often deriving in epidemics or pandemics. For the latter, the immune system has no automatic answers, given their novelty. The body does not “recognize” these viruses.

This scenario is not new. Several authors have been warning for some time on the risks of epidemics and pandemics in the modern world. SARS (SARS Co-V), Zika fever and the Bird flu (of the influenza group) were important signs of the global risks that contagious diseases present. They were rapidly forgotten until COVID 19 arrived. The present COVID
19 pandemic allows a real pandemic to be visualized and “felt” for the first time in modern history, at the moment maintaining low mortality levels in the general population but whose virulence and consequences are notable and intrusive in all aspects of daily living.

An international view of climate change and public health

From 2000 onwards, the climate change international agenda has allowed and facilitated important advances in terms of awareness, understanding and the adoption of formal commitments to address public health matters associated to climate change.

The work of the World Health Organization (WHO) “Climate Change and Human Health: Risks and Responses” (2003) sparked interest and triggered national and further international action. Starting 2000 developing countries, including in Latin America, barely talked about the linkages between climate change and public health and implications in all aspects of life.

In recent years, declarations and manifestos of different nature have multiplied, urging prioritization of the discussion on climate change and public health. For example, the Doha Declaration on Climate, Health and Wellbeing (Global Climate & Health Alliance, 2012) proposes that countries place health at the center of climate action, to impacts of climate on development and wellbeing to be better visualized and understood;\(^\text{13}\) the Declaration on Climate Change and Health (American Lung Association, 2016), recognizes that extreme climate patterns destabilize communities and habitats, broadening the geographical range for vectors such as mosquitoes, ticks and other disease carrying insects;\(^\text{14}\) the Durban Declaration on Climate and Health (Health Care without Harm, 2011), recognizes the positive effects of climate mitigation on public health and the need to avoid a public health disaster worldwide.\(^\text{15}\) Although these are non-binding instruments, they set a pattern and tendency that highlights an issue that is certainly still overlooked in debates at this very time.
What are the responses from Latin America?

Climate change is already affecting Latin America in a very visible manner, and certain events (i.e. the El Niño and La Niña phenoms) have also allowed the identification of certain patterns in the appearance and movements of disease vectors, mainly in the case of dengue, yellow fever, cholera and malaria. According to the BBC in London, certain diseases “travel with the El Niño phenom” generally producing catastrophic effects every time it takes place. The Niña phenom on the other hand, associated with colder temperatures, generally has the effect of causing droughts in many parts of the region.

Standing water, the expansion of water bodies (wetlands, lakes, etc.), the collapse of sewage systems, etc. due to very heavy rains as a result of the 2017 El Niño in poorly prepared places (i.e. cities of Piura or Trujillo in Peru or Mocoa in Ecuador) have brought collateral effects with the appearance of contagious viral and bacterial diseases. This has direct consequences in numerous areas: economic, social, human settlements, and certainly public health.

Nobody was really prepared for COVID 19 and some countries have done better than others at the level of initial containment and responses. This said, this particular pandemic could have been prevented, confronted and mitigated, based on relatively recent experiences with the Severe Acute Respiratory Syndrome (SARS), Zika and Bird Flu epidemics, through come form of early warning and timely response mechanism. Better international coordination would also have contributed significantly to mitigate impacts. Measures such as specific health insurance for contagious epidemics and diseases could have been considered earlier.

In the case of COVID 19, it is still not clear whether climate change has had or will have a significant role in its propagation, as temperatures are warming or cooling in different parts of the world.

Closing borders, mandatory quarantines and the reduction of economic activities to the minimum, are momentary mitigation measures that sooner or later will give way to the main battle for the improvement of public health systems overall. The collapse of many public health systems is foreseeable, given the dismantling of health and public research systems in the 1990s in many countries of the region. This poses challenges and really basic human and fundamental rights questions given the current circumstances.

Prospective and multidisciplinary research to provide answers on the role of the “public sphere” (e.g. the State) and understanding the immediate and future effects of climate change on public health in Latin America has been very limited and poorly integrated in decision making processes. Work by Cueto, Contreras, Lopes, Cerrón and other authors have been notable, but insufficient to visualize the relevance of the climate variable in public health. Many authors focus on socio-economic factors to explain the risks of epidemics and pandemics in tropical countries and by contagious diseases in particular. The series “Historia, Ciencia y Salud” published by Fundación Oswaldo Cruz in Brazil is exceptional in terms of its historic journey through epidemics and diseases that have afflicted the continent during the last few centuries.

There is an abundance of texts and literature that suggests that temperature elevation due to climate change will have a notable effect in the expansion and dissemination of disease
carriers or vectors. As previously indicated although the causal link is still to be proven, there is a certain consensus that this expansion will occur.\textsuperscript{21}

In more formal and informative terms, some national reports on climate change (i.e. in the case of Peru, Mexico, Brazil) or communications from the Framework Convention on Climate Change, include small and limited references to the effects of climate change on health. These reports succinctly describe the problems related to the increase of temperatures and contagious diseases, but do not offer a detailed revision or multidimensional analysis of the event and its consequences. The integration of the climate change agenda and public health is still limited.
Final reflection

The crisis currently being experienced with COVID 19 places many issues on the table. Among these, the existing shortage of specific research on diseases, public health and the effects of changes in climate patterns, particularly in vulnerable countries in Latin America and elsewhere. Endemism of many tropical diseases demands a better understanding of their emergence and extensive propagation.

At the same time, there is the need to rethink the States withdrawal from “the public sphere” and how this has affected research, extension and primary health systems in countries. Economic principles explain quite well the abandonment of this public space and the expansion of private sectors in other health areas.

In addition to the above, attention in the control of diseases through “efficiency” provided by private or public-private health services has relegated a greater involvement in prevention and improvement of living conditions for the most vulnerable as an initial action to avoid diseases. This requires a different vision to the idea of development, based on how to permanently contain these contagious and virulent diseases, and this required investment in education, extension, infrastructure, health, etc. in areas and places historically forgotten by the State and private sector. Ex ante action is proposed for prevention and not the preference of ex post efficiency for its treatment.

Beyond the legal obligations imposed to countries in order to comply with their environmental commitments in terms of mitigation to avoid global warming, the COVID 19 crisis prompts us to raise the need to urgently face climate change as far as possible and feasible, without conditioning this to the action of third parties. In this regard, the environmental agenda on international development has the opportunity to extract positive lessons from this crisis. For example, integrating through mandates and recommendations (i.e. through the Sustainable Development Goals (SDGs) or in the Post-2020 Biodiversity Framework) a call for a closer look at the convergence and relationships between climate change, biodiversity and public health as a result of COVID 19 and its effects at multiple levels of everyday life, mainly of the most vulnerable and unprotected.

For example, current technology such as Big Data could help in the development of early warning models or mechanisms on the presence of diseases or epidemiological monitoring, based on tracking climate patterns. The arsenal of existing technological tools could help to the generation of a warning system based on these variables: the endemic presence of viruses, changes in climate patterns, vulnerability of the population, containment and response mechanisms, etc. A regional approach, based on evaluating the possibility of integrating SiCA, OTCA, the Andean Community and Mercosur, with similar competence or mandates could be a first step. Secondly, the Forum of Ministers of the Environment of Latin America and the Caribbean offers another possibility to formalize a type of mandate oriented towards strengthening research in the different dimensions of climate change and public health, as a preventive action regarding COVID 19.

Finally, the COVID 19 crisis highlights a number of questions that require attention and demand answers, thinking about the future of the region. Implementing a space and
organizing a forum (virtual, and presence-based when the crisis is over) to address critical questions is more than necessary. This space, could for example, address questions such as:

- What can be learnt from COVID 19 and extrapolate from other diseases present in the region, and which in many countries are endemic?

- How do changes in climate patterns exacerbate (or not) tropical diseases and others, and what tools do we have to prevent, mitigate and face the problem?

- Is a warning and monitoring system for diseases possible that would integrate climate change variables? Do public health systems have access or interact with competent sectors to monitor climate change?

- What are the lessons COVID 19 leaves us in terms of public health systems -beyond its outburst- and how to face a probable future crisis?

An open, transparent and relevant agenda could be constructed around these questions in light of the COVID 19 crisis and with a view of creating a better and safer future for humanity.
References


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1. This idea was expressed by the President of the United States, Donald J. Trump, in February 2020 in an exchange with the press. He subsequently corrected and moderated the initial claim.

2. Marcos Cueto, a historian of public health in Latin America, traces the increasing impacts of contagious diseases, among others, to the dismantling of public research and public health services during the eighties and nineties, as a result of the economic liberalization that emerged from the Washington Consensus. He argues that current shortages and the health system crisis in the region as a result of Covid 19 can be traced to these causes. See, Cueto, M. Covid 19 and the Globalization of Epidemics. Historia Ciencias Gáude. Maghinos. March 2020. Available at, http://www.revistahcsm.coc.fiocruz.br/english/covid-19-and-globalization-epidemics/?fbclid=IwAR2qNuQbM68svdlPKaryRCr9G5OwYeQfemBYO2yEd9Bvyab7VWwaxQV


7. It is estimated that a high percentage of the world population (between 70% and 80%) deals with their basic health problems through traditional medicine and folk prescriptions. Many times, their efficiency depends on the specific illness and several factors including the climate and geographic characteristics of the region, medicinal plants used, dosages and applications, etc. See, Gerberding, J.


9. It is suspected that the SARS epidemic in 2003 and present Covid 19 originated from the so-called “wet markets” in Wuhan, China, where wild and domesticated animals are consumed, including bats, rodents, snakes, monkeys and many others, originating from within China and nearby Asia. See, Business Insider, February 17, 2020 edition. Available at, https://www.businessinsider.com/wuhan-coronavirus-chinese-wet-market-photos-2020-1


11. Large pharmaceutical companies have never been interested in producing medications to address tropical diseases. There are various reasons, which are beyond the scope of this essay. However, suffice to say that the production of these medications is not profitable, given the primary subject population they could serve, mainly poor people in developing countries. Research, development and the production of these medicines has been in charge of some public research systems and private initiatives such as the Gates Foundation in Africa. For reasons under investigation, which probably include genetic and environmental factors, specific to certain areas, many antibiotics begin to lose efficiency against bacterial infections as well as the antivirals and vaccines that attack different viruses. See, Gerberding, J. Antibiotic Resistance: The Hidden Threat Lurking behind Covid-19. Stat Reports. March 23, 2020. Available at, https://www.statnews.com/2020/03/23/antibiotic-resistance-hidden-threat-lurking-behind-covid-19/

12. In Germs, Guns and Steel (2005), Jarred Diamond describes the role of germs and their spread in the weakening and conquest of indigenous peoples in many regions around the world, mainly by European in the Americas. Preston Scott in The Hot Zone (1994) describes the origin of the Ebola virus, how it reached North America and the risk at the time due to the high probability of becoming an epidemic on American soil.


15. Durban Declaration on Climate and Change, Health Care without Harm, 2011, see, https://noharm-global.org/content/global/durban-declaration-climate-and-health


Although the SDGs do not make a direct, explicit and immediate connection between public health and climate change, under the SDGs 3, countries commit to end the AIDS, tuberculosis, malaria epidemics and neglected tropical diseases, and combat hepatitis, water transmitted diseases and other transmissible diseases. See, https://www.un.org/sustainabledevelopment/es/health/

Although the zero draft of the Post-2020 Biodiversity Framework curiously includes references to development, wellbeing, health, nutrition, sustainable use of wild flora and fauna species (possibly one of the sources of transmissible diseases) and the need to establish synergies between the biodiversity and climate change agendas, public health, climate change and biodiversity as interconnected variables remain silent. See, https://www.cbd.int/doc/c/efb0/1f84/a892b98d2982a829962b6371/wg2020-02-03-en.pdf

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