

GLOBAL HEALTH

THE CURRENT SCENARIO AND
FUTURE PERSPECTIVES

GIORGIO SOLIMANO C.

JORGE RAMÍREZ F.

ALEX ALARCÓN H.

EDITORS



ABOUT THE EDITORS:

Giorgio Solimano Cantuarias

Dr. Giorgio Solimano Cantuarias is a public health physician and Full Professor at the University of Chile and Columbia University in New York. He has previously served as an academic at the Massachusetts Institute of Technology (MIT), USA. From 1999 to 2011, he was the Director of the Salvador Allende School of Public Health, Faculty of Medicine, University of Chile, and from 2014 to 2018, he held the position of Director of Strategic Development and Institutional Relations at the University of Chile.

Jorge Ramírez Flores

Dr. Jorge Ramírez Flores is a medical doctor with a Master's degree and specialization in Public Health from the University of Chile, as well as a Master's degree in Global Health from the University of California, San Francisco. He serves as an Assistant Professor at the School of Public Health, Faculty of Medicine, University of Chile. Dr. Ramírez has been involved in various research projects and consultancy work in areas such as Mental Health, Health Planning, and Global Health Diplomacy.

Álex Alarcón Hein

Dr. Álex Alarcón Hein holds a Ph.D. in Sociology, a Master's degree in Public Policy and Social Sciences, and a Bachelor's degree in Economics and Administration. He is the Head of the Global Health Program and an Assistant Professor at the School of Public Health, Faculty of Medicine, University of Chile. His research primarily addresses migration and health, the design and implementation of health policies and social projects, as well as Global Health from a Latin American perspective.

GLOBAL HEALTH
The current scenario and future perspectives

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EDITORS

GLOBAL HEALTH

Current scenario and future perspectives

“When we thought we had all
the answers, suddenly,
the questions changed.”

Mario Benedetti

“If you truly want to
understand something, try to change it.”

Kurt Lewin

In the times we live in, editing a book on Global Health is an ethical imperative, given the circumstances of contemporary society. The main purpose of this publication is to communicate and expand knowledge in the field of Global Health to readers from both, the healthcare sector and other areas of knowledge, with a broad perspective that transcends disciplines.

The book is organized into sections. It ranges from the most theoretical and necessary aspects, to understand the evolution of Global Health to the analysis of organized social responses to global health issues. It covers the challenges of environmental risks to health, related to globalization; provides updates on some especially relevant diseases for the global health landscape of recent decades and addresses specific socio-health topics that share significant inequalities worldwide.

We hope this effort contributes from the academic world, serving as a reference or starting point for those working or getting involved in various Global Health topics. And as importantly, we hope that readers enjoy the content.

“In this field of ideological and scientific struggle, this book on global health from Universidad de Chile introduces us to a new intellectual debate, reinforcing the idea of global health, which is more relevant than ever.”

Álvaro Franco

“... this new publication, which draws attention to the need for a transdisciplinary and critical understanding of the determinants of the political economy of global health, is a welcomed addition to the fight for health”.

Ron Labonté

Editors

Giorgio Solimano Cantuarias

Public health physician, Full Professor at Universidad de Chile and Columbia University N.Y.; former Massachusetts Institute of Technology (MIT), USA faculty member.

Director for three terms of the School of Public Health “Salvador Allende G.”, Faculty of Medicine, Universidad de Chile (1999-2011), and Director of Strategic Development and Institutional Relations at Universidad de Chile (2014-2018).

International expert and human rights activist. He is member of several national and international scientific societies. Author/editor of a dozen books, over sixty scientific articles in national and international journals, and numerous reports for international organizations.

This year, he has published “Los Riesgos de la Verdad: Salud Pública y Compromiso Social” (The Risks of Truth: Public Health and Social Commitment) (Editorial Catalonia 2022).

Jorge Ramírez Flores

Medical Doctor. Master's Degree in Global Health from the University of California, Master and Specialist from Universidad de Chile. Currently, Assistant Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

His research focuses on mental health epidemiology, global health from a Latin American perspective, and the influence of alcohol as a determinant of health. He has published various articles in Latin American public health journals, contributed to book chapters, and participated in research on mental health, mental health diplomacy, and Covid-19.

Álex Alarcón Hein

PhD in Sociology. Master's in Public and Social Policies. Head of the Global Health Program at the School of Public Health, Universidad de Chile. Assistant Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

His fields of interest focus on migration and health phenomena, the design and implementation of social policies and projects in health, and Global Health from the Latin American perspective. He has published

several articles and columns in national and international healthcare-related journals and participated in public health research projects.

Authors

Alvarado Muñoz, Rubén. Medical Doctor. PhD in Psychiatry and Community Care. Associate Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

Araya Bannout, Marcela. Nurse. PhD in Nutrition and Food. Master's in Public Health. Certificate in the Right to Adequate Food. Assistant Professor in the Department of Women and Newborn Health Promotion, Faculty of Medicine, University of Chile.

Arteaga Herrera, Óscar. Medical Doctor. Master's in Health Administration, MSC Health Services Management, and PhD in Public Health. Associate Professor, Faculty of Medicine, Universidad de Chile. Adviser for different international organizations.

Cisternas-Bórquez, Hellen. Psychologist. International Executive Master's in Development Studies. Candidate for a Master's in Public Health from Universidad de Chile.

Cumsille Garib, José Francisco. Statistician. Master in Biostatistics, PhD in Public Health. Contributor in the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Eguiguren Bravo, Pamela. Midwife, PhD in Public Health. Assistant Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

Estévez Valencia, Rafael. Psychologist. Master and PhD in Organizational Behavior. Contributor in the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Figuroa Fernández, Alejandra. Biologist. Candidate for a Master's Degree in Risk and Resource Governance. Director of Corporación Capital Biodiversidad. Contributor to the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Lagos Lira, Claudia. Journalist and Master in Gender Studies. PhD in Media and Communications. Associate Professor, School of Communication and Image, Universidad de Chile. Editor of the magazine Comunicación y Medios.

Las Heras Bonetto, Jorge. Medical Doctor. PhD in Pathology. Full Professor at Universidad de Chile. Former Dean of the Faculty of Medicine, Universidad de Chile. Former Deputy Rector of Universidad de Chile. Member of the Chilean Academy of Medicine.

Maturana Palacios, Alberto. Medical Doctor. Faculty in the Policies, Systems, and Health Management Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Maurás Pérez, Marta. Chilean diplomat and sociologist. Former Permanent Representative of Chile to the United Nations in Geneva. Member of the Permanent Foreign Policy Forum. Contributor to the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Navarro Rosenblatt, Deborah. Nutritionist. Master's in Public Health Nutrition. PhD in Public Health. Methodologist in the Department of Evaluation and Health Technologies and Evidence-Based Health, Ministry of Health of Chile.

Palmeiro-Silva, Yasna. Nurse, Master's in Public Health. PhD Candidate in Global Health. Contributor in the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Póo Figueroa, Ximena. Journalist and Bachelor of Communication. Master's in International Relations and Communication. PhD in Latin American Studies. Associate Professor, Faculty of Communication and Image, Universidad de Chile.

Ravanal Ponce, Mariela. Journalist. Certified in Marketing Management and Master in People Management. Director of Communications, Universidad de Chile. Professor at the Faculty of Communication and Image and Strategic Communication and Political Marketing at the Faculty of Government, Universidad de Chile.

Rodríguez Osiac, Lorena. Medical Doctor, Specialist in Pediatrics. Master's in Nutrition. Director of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Rosenberg, Rubel Hernán. PhD candidate in Engineering Economics Systems, Master's in Economics, Industrial Engineer. Adviser in Economics and Health Systems, Vice President of Development Outcomes Organization. Associate Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile, and Universidad de la Frontera.

Silva Santa Cruz, Ignacio. Psychologist, Master in Global Health and

Development. Instructor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

Solimano Ratinof, Andrés. Economist. Master in Economic. PhD in Economics. Founder and President of the Centro Internacional de Globalización y Desarrollo (Ciglob).

Stuardo Ávila, Valeria. Midwife. PhD in Public Health. Assistant Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

Sulbrandt Cabezas, José. Lawyer. PhD in Sociology. Faculty in the Policies, Systems, and Health Management Program and Contributor in the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Tobar Aravena, Tatiana. Pharmaceutical Chemist. PhD Candidate in Pharmaceutical Sciences. Regulatory Coordinator at Agencia Nacional de Medicamentos (Anamed), Public Health Institute of Chile, Ministry of Health (Minsal).

Valdivia Matus, Leonel. PhD in Education Sciences. Former academic and current contributor in the Global Health Program of the School of Public Health, Faculty of Medicine, Universidad de Chile.

Yohannessen Vásquez, Karla. PhD in Biomedical Research Methodology and Public Health, Master's in Public Health. Assistant Professor at the School of Public Health, Faculty of Medicine, Universidad de Chile.

Preface

We can safely say that in the times we live in, editing a book on Global Health is an ethical imperative. This is how we understand it in the Global Health Program of the “Dr. Salvador Allende G.” School of Public Health at the Universidad de Chile. That is why, a little over a year ago, we decided to undertake this task as an academic but also as a human commitment. Given the circumstances of contemporary society, we hope it will be a valuable contribution to different audiences, including the national, Latin American, and global academic world, and especially to future generations.

The main purpose of this book is to communicate and expand knowledge in the field of Global Health to readers in the health sector and other areas. This book provides a broad perspective that transcends disciplines in a time when diverse health problems are gaining renewed importance and require a global, interdisciplinary approach.

Since the beginning of this century, the field of Global Health has gained increasing relevance, although it is a discipline that is still developing with imprecise boundaries and different significance depending on who and where it is practiced. In our region, the Alianza Latinoamericana para la Salud Global (ALASAG) was created a bit more than ten years ago under the mission of “promoting the creation and strengthening of collaborations for education and research in Global Health, through regional cooperation, as a response to common challenges, based on our national realities and with a deep respect for the idiosyncrasy and identity of our peoples.” The ideology of ALASAG, whose founding members we are, has been clear from the beginning: understanding Global Health as the best way to approach health as a global public good from a perspective of social justice and universal rights based on equity, ethics, and respect for human rights. This ideology somewhat differentiates us from the prevailing approaches in northern countries. It gives Latin American Global Health a particular identity, which we believe is expressed in the articles on various topics in this book.

We also believe that our academic team has the capabilities to examine and formulate propositions in this extensive and innovative field. These ideas are oriented to the development of knowledge in the scientific field but also to those responsible for formulating public policies at the country level and the organizations responsible for international health governance, examining new and old challenges, especially in the context of the Covid-19 pandemic and post-pandemic.

This book includes prologues by two distinguished academics of international prestige in the field of Global Health, who, from their perspectives, analyze, contextualize and propose frames of reference that

enrich the visions presented by the authors of the different articles.

The book is organized into five sections. The first one is general and inclusive, addressing topics such as the concept, relevance, and evolution of Global Health, taking into account the pandemic situation already mentioned; new forms of national and international health governance, prioritizing the importance of multilateralism and international cooperation; the significance of economic inequalities in a context of weak development and their impact on Global Health, as well as the role of academia in the training of human resources, research, and engagement with the Global Health environment.

The second section deals with the main environmental health risk factors related to globalization. Here, different elements of the environment are analyzed concerning health, the accelerated loss of biodiversity, and the alarming climate change.

Subsequently, four groups of diseases that have become relevant on the global scene in recent decades are examined: i) chronic non-communicable diseases related to nutrition, ii) those in the sphere of mental health, and not to overlook iii) emerging and re-emerging communicable diseases, and finally, a rapidly developing field, iv) One Health.

The fourth section addresses four specific socio-sanitary topics that share a close relationship with “unfair and avoidable” health differences but present diverse approaches to understanding them: the migration process, substance use, the gender perspective, and population aging.

The book concludes with an analysis of the organized social response to Global Health issues. Here we can find interesting perspectives on health systems and services, the current situation of drug development and management (including vaccines, of course), the growing interest in Global Health diplomacy, different experiences dealing with emergencies and disasters, and valuable considerations regarding the topic of health communication.

We hope that this book will be a contribution, from the academic world, serving as a reference or starting point for those already involved or getting involved in different and interesting topics of Global Health. However, equally important, we hope that readers enjoy reading it.

The Editors

First Prologue¹

Ronald Labonté²

After twenty years of working as a community health promoter, first in Canada and then internationally, I bumped into what became known as ‘globalization’. In country after country, I heard public health practitioners complain of program cutbacks, staff retrenchment, and a retreat from the idealism of the 1986 *Ottawa Charter for Health Promotion* (WHO, 1986). The year was 1994. I reasoned that the ubiquity of these complaints suggested that there must be something above the level of nations getting in the way of an empowering public health practice. In 1995 the World Trade Organization came into existence and my attention made a sudden shift from catalyzing community level health activism to understanding how a globalizing political economy was constraining our generation’s ‘health for all’ optimism.

My emergent knowledge would have been laughable to many people living in Africa and Latin America, the early global regions to be adversely affected by what we now short-hand as ‘neoliberalism’, a market-fundamentalist capitalism on ideological steroids. Chile was one of neoliberalism’s earliest policy laboratories following the violent overthrow of the social medicine and social democracy of the Allende government. Today, with its efforts to create a new human-rights focused constitution that addresses our ever more urgent health crises of inequalities, climate change, and xenophobic exclusions, Chile is again witness to the political struggles between progressive and reactionary populism that have become a defining feature throughout Latin America and many other regions of the world. These ‘struggles for health’, as the sorely missed late Prof. David Sanders liked to remind us, are the ‘struggle for a more equitable, just, and caring world’ (Sanders, 2020).

The Covid-19 pandemic (subdued but still with us) highlighted the increasing fragility of our entwined sociopolitical and ecological systems upon which our health depends, and the pressing need for a *volte face* from many of our global economy’s tacit and unjust imperatives. As one example, this new collection notes, the incursion of private capital and publicly funded private providers in many countries’ health systems left them

¹ Editor’s Note: Given the relevance of this prologue in English, the native language of its author, it is maintained as such.

² BA MA Ph.D. Professor Emeritus. Ronald Labonté is Distinguished Research Chair in Globalization and Health Equity and Professor in the School of Public Health and Epidemiology, University of Ottawa. He has enjoyed a 45-year career in public health spanning government positions, international consultancies, and universities. For the past 25 years his research has focused on the health equity impacts of diverse globalization processes. He is Editor-in-Chief of the BMC journal, *Globalization and Health*, active with the People’s Health Movement, a frequent contributor to its flagship publication *Global Health Watch*.

woefully ill-prepared for SARS-CoV2, even as the pandemic showed us the importance of care provision (in health and more widely) as humanity's greatest and most under-valued gift. While we heaped praise for health and other essential workers who bore the burdens of the worst of the pandemic, our still dominant financialized and predatory form of capitalism exacerbated already gaping socioeconomic inequalities. Billionaire wealth skyrocketed during the pandemic even as most of the world's peoples saw their livelihoods collapse.

Whether the pandemic will finally unseat neoliberalism's hegemonic grip over the determinants of our (ill) health—as we hoped the 2008 global financial crisis should have done—is still moot. The shibboleth of inflation has fiscal hawks sharpening their talons, blaming it on governments' excess borrowing and spending (to cope with the pandemic) while largely ignoring supply/demand disruptions and excess corporate profiteering as likely causes. Russia's invasion of Ukraine has jettisoned many of the commitments countries have made to de-carbonize their economies and achieve their emissions target of net-zero by 2050 target. The failure of liberal democracy under the strictures of neoliberal inequalities has incited a new generation of autocrats, keen to divide and conquer an already fractured public.

This is the global health landscape of late 2022. It appears grim (it is), yet as this collection interrogates, there are policy options governments could pursue to mitigate these crises. Climate change (more accurately described now as climate chaos) is the most pressing threat to human and ecosystem health. Fossil fuel remains politically powerful as the challenge the US Biden Administration has faced in trying to implement its 'build back better' climate and social protection agenda demonstrates. Still, subsidies and investments in 'green energy' outpace those in oil and gas, and there is momentum to institute carbon border taxes to incentivize global compliance with agreements to lower emissions, in an attempt to leverage global trade for a public (rather than singularly private) good. To do so equitably means ensuring that global carbon markets are governed such that rich countries bear disproportionate costs reflecting their historic responsibility for emissions, and that 'nature-based' solutions do not allow them to lower their emissions simply by purchasing carbon offsets in poorer countries desperate for debt-relief or financial assistance.

Even if countries succeed in weaning themselves off coal, oil, and gas, there are finite limits to the human consumption of material resources that earth can provide. Climate change and biodiversity loss are merely the sharper edges of humanity's massively unequal appropriation of planetary wealth. Here we confront the consumption/growth imperative of capitalism, however much we might tame its dis equalizing outcomes by reimposing the systems of progressive taxation (at national and global scales) so blithely

slashed under neoliberalism. We already consume annually over 4 times the ecological resources the planet can replenish (Labonté & Ruckert, 2019). Yet there is enough material (and financial) wealth for all to enjoy good health and quality of life without imperiling the planet, if such wealth were shared equitably. This requires a retreat from centuries' old assumptions about economic growth and 'development' being the road to better health and to embrace, instead, the South American Indigenous concept of *buen vivir*, of living well in communal harmony. Doing so further demands a radical reduction in consumption by the wealthiest minority of humanity (they will still be living well) to create the growth and consumption space needed by the world's poorer majority (Labonté, 2022)– a radically different form of 'trickle down' economics than the one envisioned by the neoliberal elite. Here, the work of the World Health Organization's Council on the Economics of Health for All (scheduled to complete sometime in 2023) provides important theoretical, empirical, and pragmatic insights on how to reshape economies for health and human purpose.

Moving forward on such an agenda calls for more effective forms of global governance. The pandemic was not one of multilateralism's finer moments. From vaccine hoarding to Pharma profiteering to rich country subordinating global health to financialized capitalism's intellectual property rights, the pandemic showed how weak government rhetoric of global solidarity is in practice. The headlined intent of 2015's Sustainable Development Goals and Paris Climate Accords, despite their flaws, are not forgotten and continue to mobilize civil society activism for the 'world we want' (now, the 'world we need', and desperately so). Attempts to reach a new pandemic preparedness instrument hold promise for the 'global health diplomacy' that this collection discusses. The various clubs of nations (e.g., OECD, G7, G20, BRICS, ASEAN, UNASUR) of necessity increasingly grapple with global/regional health and environmental concerns.

But democratic deficits persist, notably with the governing bodies of the World Bank and International Monetary Fund which continue to largely set the norms for a global market economy. The United Nations and its affiliated bodies (including the WHO) continue to see their underfunded budgets increasingly reliant on a few donor nations or philanthropies, distorting their programmatic priorities. More worrying still is the increasing penetration of corporate wealth and influence within the many 'multistakeholder' global governance forums that have multiplied since the new millennium ("Conclusion: building power in the struggle for health (justice): a call to health activists", 2022).

In the pursuit of an eco- just global health, *a luta continua*. But this does not mean that popular struggles, even in the face of autocratic rule and the shrinking of public space in many regions of the world, are without purpose or success, as the most recent edition of *Global Health Watch 6: in*

the shadow of the pandemic, recounts. So, too, do the various contributions in this new collection that draws attention to the need for a transdisciplinary and critical understanding of the political economy determinants of global health. As such, it is a welcome addition to the 'struggle for health' (The Global Health Watch, 2022).

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Second Prologue

Álvaro Franco-Giraldo³

Global health is a concept that has shaped a renewed vision of the healthcare world or even a different academic trans discipline in recent times. Sometimes, it follows multilateral organizations such as the United Nations or the World Health Organization, while others, it is under the guidance of academic institutions like the School of Public Health at Universidad de Chile and civil society organizations like the Alianza Latinoamericana de Salud Global, among others, from both, the Global South and the Anglo-Saxon North global health has become a polysemic term in this context, as has been highlighted in several articles and publications within a diverse ideological mosaic.

In the framework of the VI Latin American Congress on Global Health, Tuesca (Tuesca Molina, 2021), cited Solimano and Valdivia (Solimano, 2014) among others, recalling the Latin American notion of global health: “The notion of Global Health is embedded in an emerging academic conception, based on complexity, continuous transformation, and is considered a scientific and political emerging discipline that, based on evidence, rebuilds a new public health for the 21st century.” The same congress strengthens some purposes of global health, such as responding to the challenges of globalization, shaping its future perspective and establishing new governance in health for the sake of equity. Always recognizing health as a global public asset. In this line of thought, this prologue envisions a future global health perspective, considering different concepts and the issues surrounding the Global South countries and the Latin American region.

In recent decades, global health has shaped an academic-political field as an intellectual struggle to ensure the prevalence of specific ideas over others. Within this field, we can highlight, at least, three trends: 1) the northern conception, influenced by globality, which implicitly carries the ideology of neoliberal globalization; 2) the perspective of Alasag, with its Latin American vision of global health mentioned above (Franco-Giraldo, 2016), and 3) more recently, the rise of the Global South vision, which encompasses initiatives that used to oppose neoliberal globalization and now assume the voice of the “periphery of the world system (...) Global

³ University Professor. Physician and public health specialist from the University of Antioquia (Medellin); Doctorate in Public Health from the University of Alicante (Spain); Specialist in State and Public Policy; Diploma in Philosophy; Hospital Administration Specialist, INSP Mexico; Diploma in Social Security, CIESS, Mexico. He was the dean of the National Faculty of Public Health in Colombia and vice-rector of the University of Antioquia (2015 to 2018). Currently, a university professor and Senior Researcher at Colciencias in the areas of Global Health, Public Policy, Primary Health Care, and Health Reform. GISCO Group, Universidad Visión de las Américas. He has published 2 books and several book chapters, and more than 120 academic articles in national and international journals.

South” (Fernández et al., 2014), following the dynamics of the periphery in Latin America and East Asia. In this arena of ideological and scientific struggle, this book on global health from Universidad de Chile, *Global Health, the Current Scenario, and Future Perspectives* introduces us to a new intellectual debate, affirming the idea that “global health is more relevant than ever.”

Global health issues present a challenge and must be addressed with a renewed vision of global public health, beyond health problems specific to national and interstate spaces. This is a key approach in the current debate on the relevance of global health, especially when some believed that discussing global health was pointless in the face of the crisis of globalization. Thus, as this book begins, it is useful to highlight the most pressing issues in the world of global health with reasoned arguments and supported evidence.

Certain issues have made us think about the health perspective, following these ideological considerations: global geopolitical tensions, including war and violence; the COVID-19 pandemic; the rise of emerging and re-emerging diseases; accelerated climate change with unforeseen effects on the environment, human health and the planet; inequities and social injustice; regional and local asymmetries blurred in the global order; the phenomenon of migration and forced displacement within and between countries; the ineffectiveness of global diplomacy and the shortcomings of multilateralism. Global institutional mechanisms and governance arrangements between states and other transnational actors are responsible for this framework of global injustice. They contribute to the deterioration of living conditions and the violation of citizens' rights globally, as well as determining the health of populations in countries, regions, and localities worldwide.

This outline analysis does not aim to be exhaustive, since that is the task of the book. However, it serves as a framework for the main global problems in the contemporary world two decades into the 21st century.

Thus, the COVID-19 pandemic has raised the issue of global health to a new level, as stated by Rodríguez, Fanjul, and Vilasanjuan (2022). “The most predictable of the many consequences of the COVID-19 pandemic are related to the importance acquired by global health on the international agenda and the transformation of the global health system”. As a corollary of the pandemic, global health is acknowledged as a primordial political issue, given the limitations of governance and of great interest to global geopolitics. In this regard, global health diplomacy has been hindered by the crisis of multilateralism, as denounced by Kickbusch, Kökény, Kazatchkine, and Karaman (2021), considering the difficulties in addressing the COVID-19 pandemic due to national egoisms, geopolitical games, and nationalism

that affect public health and global solidarity. Similarly, Sojo (2021) also reports on global governance and the 2030 agenda after the coronavirus pandemic.

Another epidemic impact with global economic and social consequences is posed by emerging and (re)emerging diseases: “In the 21st century, we have multiple examples thereof, most with pandemic potential: SARS, H5N1 influenza, H1N1pdm09, H7N9, MERS-CoV, and currently Covid-19. This is in addition to known infections that were limited to certain regions and have spread to others, such as outbreaks of Ebola or the arrival of Chikungunya and Zika in the Americas” (Alpuche-Aranda, 2020). These represent one of the major problems for global public health, food security, and human development globally. This situation is aggravated further because, according to the WHO, “of the total of 56.4 million deaths registered on the planet in 2016, four groups of communicable diseases are among the top ten causes of death, accounting for a total of 6.8 million deaths: lower respiratory infections (3 million), diarrheal diseases (1.4 million), tuberculosis (1.3 million), and HIV/AIDS (1.1 million). Together, they were the third leading cause of death after ischemic heart disease and stroke, which accounted for 15.2 million deaths”.

As a result, challenges and threats to health systems and global health practice have increased, reinforcing the need for more investments in health systems. However, these investments must reflect the importance of those who constitute and influence the dynamics of these systems. (Silva & Mendes, 2021).

Another vital phenomenon, certainly the most important one, is climate change, which challenges global health. Among the diverse authors and scientific articles on this topic, the call and plea of scientific journals to the United Nations General Assembly in September 2021 to tackle the global environmental crisis stand out: “We, the editors of health journals around the world, are calling for urgent action to keep average global temperature rise below 1.5°C, halt the destruction of nature, and protect health” (Atwoli et al., 2021). Health professionals have been rooting and denouncing this concern about the increase in global temperature and the destruction of nature for several decades.

In summary, the field of global health presents major socio-health and social challenges that threaten population health. These challenges result into health system needs and global health governance demands. It is critical to maintain focus on the Sustainable Development Goals 2030 (UN, 2015) and the various global public health strategies that have been promoted up to now. However, greater initiatives and innovation in global health are required to shed light on solving problems such as major pandemics that threaten humanity and the destruction of the environment

and planet Earth, given the imbalances of global capitalism and the incompetence of nation-states. Some recommendations are proposed in this sense: to renew large-scale health promotion, to change the determining structures of the world economy, to modify the unequal relationships between countries and human beings, to reaffirm a salutogenic relationship between human beings and nature and the environment, to transform locally ecological sustainable economies, to strengthen primary health care and public health by redirecting the use of power in the world towards local contingents within the framework of globality (glocalization) (Franco Giraldo, 2021).

Another path for developing global public health will be given by the paradigmatic renewal of this discipline as a field of knowledge. Understood as a new discipline for action concerning population health worldwide (global public policies) about governance and international diplomacy within a new architecture of power (a new set of actors in international relations). It is needed to advance in constructing a Latin American or peripheral or global South perspective on global health, which promotes the defense of rights and new global health governance (Franco-Giraldo, 2016).

In this line of thoughts, one of the most pressing concerns from the academic perspective has been the definition of disciplinary and thematic areas of global health. This book from Universidad de Chile accomplishes this, as can be explored in its thematic content: it not only collects the most innovative topics at the forefront of health knowledge but also the central issues of globalization, which it categorizes and analyzes, outlining a path for the development of this field of knowledge.

In line with a Latin American and counter-hegemonic perspective, it raises the issue of global health and, hand in hand with this, addresses global health governance and the role of academia, which is crucial for contemporary transdisciplinary debate. This same segment analyzes economic inequality and development, the main social determinants of global health. Another well-studied area in this text is that of global risks to the planet and human health, including globalization and the environment, biodiversity and human health, and the unpredictable climate change, the most challenging of our ills.

The book also outlines the epidemiological profile from a global perspective and the health crisis, given by emerging and re-emerging diseases, non-communicable diseases linked to diet, and the most current and invisible problem to date: global mental health. As a corollary, the strategy of one health with an interdisciplinary and trans sectoral approach. Another transnational area focuses on the most specific issues of the globalization era: international migration and its emphasis on Latin America, which impacts and overwhelms health systems, as well as the

rethought drug policy towards a public health approach (interesting and well-considered initiative). In addition to that, two topics on the human life cycle and full citizenship: sexual and reproductive rights and longevity in terms of equality. Finally, the challenges and opportunities for health systems are addressed, impacted by significant global risks, regional cooperation, free trade agreements, health diplomacy, and health communication.

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PART I.

CURRENT CONTEXT OF GLOBAL HEALTH

1. Global Health: Characterization, Relevance, and Approach

Giorgio Solimano Cantuarias, Jorge Ramírez Flores and Alex Alarcón Hein

Since the beginning of the 21st century, global health has gained increasing attention from academia, governments, international organizations and civil society organizations worldwide, including Latin America, where it has acquired its own identity closely linked to the characteristics of development in our countries, where inequality and inequity affect large sectors of the population.

The training of healthcare professionals and professionals from other disciplines, as well as the strengthening of research in medical schools and schools/institutes of public health, has gained legitimacy. This has led to the establishment of a growing number of global health programs and centers at the university level. The education in global health provided by Latin American universities differs from that in North America and Europe, as it primarily focuses on the effects of globalization on population health, policies and healthcare systems in our countries, and emphasizes a critical analysis of institutional structures and dominant power structures in contemporary society.

Interinstitutional and international collaboration is another notable characteristic of the approach to global health in our region as it prioritizes the establishment of alliances, partnerships and networks. These, if well utilized, can significantly contribute to the social and economic development of our societies.

Governments have also recognized the importance of global health in international relations and diplomacy, foreign trade, regulation of the pharmaceutical and food industries, accreditation of migrant professionals and intercountry transmission of communicable diseases. However, working with non-governmental organizations (NGOs) and community organizations has only been marginally addressed so far and is therefore a pending matter.

The field of global health (similar to its predecessors, international health and tropical health) originated and continues to receive its momentum primarily from the Global North, which includes some countries located in the Southern Hemisphere, while the Global South, consisting of countries with lower economic and social development, has mainly been the recipient of collaboration and host to consultants, researchers and students seeking experiences in topics of this field.

Both in academic institutions in the North and in various international, governmental and non-governmental organizations, the discourse on global health varies from the traditional altruism of alleviating health problems in poor countries (similar to the discourse of international health in the early and mid-20th century), to projecting themselves as institutions of excellence in health research and education worldwide.

Definitions of Global Health

Since its incorporation and development in academic institutions, various definitions of the field of Global Health have been formulated. Over the past decade, one of the most cited definitions is that of Jeffrey Koplan and colleagues (Koplan et al., 2009), who define Global Health as “an area of study, research and practice that prioritizes the improvement of health and the achievement of health equity for the global population” and emphasize “transnational health issues, their determinants and solutions. It encompasses multiple disciplines within and beyond the health sciences, promotes interdisciplinary collaboration and is a synthesis of population-level prevention with individual healthcare.” The article that proposed this definition made a distinction between Global Health and public health, which was questioned by Lynda Fried and colleagues (Fried et al., 2010), who argue that ““Global Health and Public Health” are indistinguishable. Both emphasize population-level policies as well as approaches to health promotion at an individual level.” It concludes by assuming that “both “address” the causes, roots of poor health through scientific, social, cultural and economic strategies.” On the other hand, Keith Martin, Executive Director of the Consortium of Universities for Global Health (CUGH), opts for the more concise definition of Global Health as “a discipline that establishes efforts to improve the well-being of the population and the planet” (Cemma, 2017). As can be seen, these definitions primarily come from the Global North, specifically the United Kingdom and the United States.

It is interesting to note that at the end of their article, Fried et al. (2010) mention that “Global Health is often perceived as international aid, technologies and interventions flowing from wealthier countries in the Global North to poorer countries in the Global South.” This helps to explain the difference in the vision of academic institutions that are members of the Latin American Alliance for Global Health (Alasag), who define Global Health in the following terms: “The academic institutions that are part of Alasag understand Global Health as a way of seeing and addressing health as a global public good, a matter of social justice and a universal right, which revolves around equity, ethics and respect for human rights” (Solimano & Valdivia, 2014). In this sense, the emerging movement for Global Health, from a Latin American perspective promoted by Alasag, aims to address inequities by leveraging similarities, synergies and common interests among countries in the region.

Our Global Health Program at the Dr. Salvador Allende G. School of Public Health, University of Chile, makes its own contribution by stating that “Global Health is understood as a dynamic population health process influenced by determinants that go beyond national borders and become common...”. Specifically, in the academic realm, it is referred to as a

“discipline aimed at training, researching and acting on transnational problems, determinants and solutions to achieve the improvement of health and health equity at a global level” (Global Health Program, University of Chile, 2018).

A recent systematic review on the subject (Salm et al., 2021), which included 78 articles predominantly in English, concludes that future developments in the conceptualization of Global Health should focus more on a pragmatic perspective of “who” defines Global Health, rather than on the “what” of the definition. This article also proposes theoretical categories and sub-topics that outline key aspects of Global Health to be taken into consideration:

1. Global Health is an interdisciplinary approach to improving health worldwide that is taught and researched in academic institutions.
2. Global Health is an ethically guided initiative driven by principles of justice.
3. Global Health is a mode of governance that influences through the identification of issues, policy decisions and the contribution and exchange of resources beyond borders.
4. Global Health is a vague and versatile concept with multiple meanings, historical backgrounds and an emerging future.

Historical and conceptual background

The statement in the introduction is not new for those who work in Global Health. Global Health is a field of study that is constantly evolving and has been addressed in academic institutions both in the Global North (Europe and North America) and the Global South (Latin America, Asia and Africa). This historical-conceptual evolution has gone through stages.

Richard Smith, former editor of the British Medical Journal, provides a numerical representation of the four stages of evolution in Global Health (Smith, 2013). Initially, during the period of European colonization, it was called tropical medicine, whose main objective was to maintain the health of colonizers and/or troops in tropical countries. Later, during the Cold War period, the concept was referred to as international health, with mainly personnel from wealthy countries providing humanitarian aid to people in poor countries. The third stage represents the current main manifestation of Global Health, which involves researchers from wealthy countries leading research programs in poor countries. Finally, with an increasing presence today and projected into the future, the fourth stage consists of research activities and other interventions led by researchers from low and middle-income countries. This classification and chronology are attributed to Peter Piot, director of the London School of Hygiene and Tropical Medicine (LSHTM). Piot has identified specific differences between the last two contemporary stages. Global Health 3.0 takes place on-site and largely

focuses on biomedical research and interventions on infectious diseases. In contrast, Global Health 4.0 takes place in multidisciplinary centers and addresses broader topics, including non-communicable diseases and disparities. Furthermore, the former predominantly uses epidemiological research, including clinical trials, while the latter employs a much wider spectrum of methods, including social sciences and intervention implementation.

In recent years, new conceptualizations have emerged that are intrinsically related to the process of defining the field of study in Global Health. Discussing these conceptualizations is of interest for various reasons, especially because different academic institutions are engaged in one or more of these versions within the realm of Global Health. One of these conceptualizations is known as “One Health”, which is defined as a collaborative, multisectoral and transdisciplinary approach operating at local, regional, national and global levels to achieve optimal health outcomes by recognizing the interconnectedness between humans, animals, plants and their environment (Centers for Disease Control and Prevention CDC, n. d.).

On the other hand, the study of “Planetary Health” is a new approach to understanding the interdependence between human activity and natural systems, such as water, air, land and biodiversity and their impact on human well-being. The delicate balance between these elements requires an integrated and multidisciplinary vision through the creation of networks and alliances that advance risk studies and propose solutions and regulation, involving all sectors concerned, from the academic sphere to their translation and impact on society (Institute of Global Health Barcelona IS Global, 2019).

Two more terms have emerged over the past decade. “Global Health Governance” is defined as the intervention of formal and informal institutions, regulation and processes of states, intergovernmental organizations and non-state actors to address health challenges that require collective and transnational action for more effective management (Fidler, 2010). Finally, we mention the field of “Global Health Diplomacy”, which describes the practices by which multiple actors attempt to coordinate and orchestrate global policy solutions to improve Global Health (Ruckert et al., 2016).

Some of these areas of development are addressed in greater depth in the various articles of this book.

Global Health in Latin America in the 21st century

The inherently unequal nature of globalization in its behaviors, rules and values must be taken seriously (Schrecker et al., 2008). Latin America is called upon to enrich the global debate on Global Health at the planetary level. This means establishing its own regional identity, contextualized within the social, historical, political and economic reality of the countries in the region, in order to effectively address existing inequalities within and between countries. Discussing Global Health in Latin America means addressing equity and social justice and incorporating social participation, intersectoral collaboration and international cooperation among countries.

The first challenge is to establish a distinct regional identity, contextualized within the social, historical, political and economic reality of the countries in the region, in order to effectively address existing inequalities within and between countries, particularly in Latin America. This region, despite its heterogeneity, shares many similarities, one of which is its being the most unequal geographical area in the world due to structural problems, which have severe effects on the health conditions of individuals, communities, countries and the region as a whole. In this sense, formulating policies that create effective South-South relations and standing as equals against the predominantly paternalistic approaches of Northern countries are another unavoidable challenge.

At the same time, discussing Global Health necessarily means strengthening an approach focused on equity and social justice, social participation, intersectoral collaboration and transdisciplinarity to successfully confront the growing global health problems that are rapidly gaining ground worldwide. To achieve this, it is important to establish effective international cooperation among countries in the region.

Finally, establishing a distinct Latin American agenda, different from that of hegemonic countries, is another priority. This agenda needs to include free trade and international trade agreements, international legislation on drug patents as well as regulations on the training, retention and migration of health professionals. It should also address the social determinants of health to overcome existing inequities and deal with epidemiological risks by including new and reemerging communicable diseases and non-communicable chronic diseases. These are the most important priorities.

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2. Governance of the Global Health System.

Marta Maurás Pérez, José Sulbrandt Cabezas, Hernán Rosenberg Rubel.

Governance in Global Health

The need for a global approach to achieve an acceptable state of global health has been recognized for over a century and a half, yet the international system has never established an adequate governance for this purpose, although some conceptual and political advances have been made. The series of pandemics at the end of the 20th century and the beginning of the 21st have had a greater impact than expected (given the experiences of the early 20th century, such as the Spanish flu and subsequent epidemics like HIV/AIDS and Ebola). This has highlighted the need to review and modify the governance system to effectively address the needs of global health, including pandemics, while considering the emergence of new strategic actors (Fidler, 2010).

This search to define the organizational parameters of the global health system is supported by relatively systematic work in political science in the 1980s and 1990s on the concepts of governance and governability, applied, among other areas, to health systems in Latin America. Both concepts have a multidimensional and relational character regarding the organization and structure of the State, which, by extension, applies to the United Nations whose membership is solely composed of States (Prats i Catalá, 2001).

The use, not only in academic but also in political contexts, of these concepts indicates the relevance of the discussion on a global healthcare system - its objectives, organization and operation- This debate has been going on for years at the World Health Assembly and is becoming more complex as the international situation grows more polarized and fragmented. The multilateral system appears not to be responding to the need for cross-cutting dialogue on common objectives, policy coordination and program agreements.

When used to designate the effectiveness, quality and good direction of State intervention, governance has provided much of the State's legitimacy in the globalization era post-Berlin Wall since 1989. The term relational governance is also used, and it is becoming increasingly clear that governance will tend to be understood as the functioning of networks and multi-level interactions among the public, private and civil sectors, along a local/global axis.

Regarding governability, suffice it to cite Michel Coppedge (Camou, 2001) who defines it as "the degree to which the political system becomes institutionalized", with institutionalization, citing Huntington (1968), as "the

process by which organizations and procedures acquire value and stability”. By further searching who should validate procedures and organizations, one arrives at the “so-called strategic actors”, those who are “able to undermine governability by interfering in the economy and order”.

Since its establishment in 1948, the formal orientation of the World Health Organization (WHO) has been that of the specialized agency for global health within the United Nations. However, it has lacked the necessary capacities, mandates and resources to exert effective leadership in all areas of global health and for the entire world.

The capacity of the WHO to assume a global and effective leadership role has fallen far short due to the governance provided by its member countries. The organization does not cover all aspects of public health or all its disciplines and suffers from other structural problems, such as the excessive autonomy of its regional offices. The successive attempts to make the system more effective have resulted in improvements and changes in its governance. However, they do not seem to fully satisfy its stakeholders, especially the main contributors to global health, true strategic actors, who have started creating other parallel and associated organizations.

Already in the Middle Ages, it was recognized that the management of certain communicable diseases was beyond what a single government could handle without coordinating with neighboring countries. However, effective cooperation agreements were only established towards the end of the 19th century. The International Sanitary Conference in Venice in 1892 established arrangements to prevent the transmission of cholera. Subsequent conferences added other communicable diseases such as yellow fever and smallpox. It is worth noting that the driving force behind these meetings was not solely epidemiological but also the need to prevent these diseases from affecting trade and the movement of people.

To implement the recommended measures, the International Sanitary Bureau was created in the Americas in 1902. It later evolved into the Pan American Sanitary Bureau, which eventually became the Pan American Health Organization (PAHO). In Europe, the Office International d’Hygiène Publique was established in 1897 with similar objectives, although each institution worked within its own geographical area without coordinating with other areas or addressing common or global issues. The focus of these regional institutions was to support the policies and programs of member countries without attempting to create a collective vision or becoming direct implementers. This task was left to the member countries.

Sovereignty versus Globality: the architecture of international relations and global health

At the end of World War II, in the first half of the 20th century, and with the creation of the United Nations as a first global post-war action, a period of great progress for humanity, science, technology, health and education began. It was a time of transformation in politics, with the nation-state moving to public-private collaboration, and in international relations, with sovereign states becoming states that are also member of a network of alliances. This period saw the development of a multilateral architecture, initially and primarily centered around the United Nations.

The United Nations system later diversified into regions, countries and specific issues, managed by specialized agencies, funds and programs. It became a true constellation of organizations, generally with their own administrations and funds, though coordinated by the UN Secretary-General. The General Assembly and predominantly state-driven governance bodies, such as the Economic and Social Council and the Human Rights Council, included many of these organizations as observers.

An era of increasing proposals for global agreements and cooperation was thus inaugurated, which in the field of health had begun with great enthusiasm at the first Conference on Primary Health Care in Alma-Ata, Kazakhstan in 1978 (WHO, 1978). This conference established the universal commitment to basic health for all, a commitment maintained till today.

Governance of the World Health Organization (WHO) and the global health system

Following the framework of intergovernmental governance of the UN system, the World Health Organization (WHO) as the specialized agency with a generic mandate for global health, focuses its governance on member state participation at the World Health Assembly (WHA), which meets once a year and where each state has one vote. The WHA elects the Executive Board of 34 technically qualified members for a three-year term. Its main function is to implement decisions and policies of the WHA, provide advice and facilitate its work. Additionally, each UN agency with a health mandate, such as UNICEF or UNFPA, is managed by a specific secretariat that receives policy guidance and budget approval from a governing council or board of that agency consisting of all or some of its member states. Ultimately, all these agencies are accountable to the UN General Assembly, composed of all UN member states.

This governance structure ensures the participation and voice of member states in shaping global health policies and programs. It allows for decision-

making processes that reflect the diverse perspectives and priorities of countries. However, it is important to note that non-state actors, such as civil society organizations and the private sector, in global health governance have become increasingly heard in recent years. Overall, the governance of global health within the UN system follows a multilateral approach that strives to foster collaboration, coordination and accountability among member states and other stakeholders in addressing global health challenges and promoting equitable health outcomes for all.

In this context, the WHO is consolidated as the preeminent normative organization in the world for health matters. It certifies vaccines, approves new drugs and treatments, validates and shares scientific research and strives to coordinate efforts towards accessible and quality global health.

Over time, as globalization processes became more complex and interconnected, the WHO system expanded and branched out into a network of its own and associated institutions at global and regional levels, involving both governmental and increasingly non-governmental entities. However, this expansion occurred within an increasingly confrontational global and regional environment and faces significant funding challenges.

Evolution of the concept of health and development

The definition of health as a state of well-being rather than simply the absence of disease implies that there are other disciplines and institutions involved in achieving health. Furthermore, the recognition of health as an investment in human capital, which started explicitly with the World Bank's 1993 report, brought financial organizations into the spotlight. Since the 1980s, international financial institutions (IFIs) such as the World Bank, and regional ones like the Inter-American Development Bank (IDB) and the Andean Development Corporation (CAF, today the Development Bank of Latin America), have evolved from merely financing hospital infrastructure to intervening in the development of health systems.

Adoption of the Millennium Development Goals in 2000 made the role of public health in development explicit by involving other health disciplines, which had been coming up in the longitudinal study on the Determinants of Health and were further reaffirmed in the Sustainable Development Agenda (United Nations, 2015)

with its 17 Sustainable Development Goals (SDGs). Science and technology, climate change and migration pose new challenges for global health that intersect with the SDGs established by unanimity at the General Assembly to “leave no one behind”, by eradicating poverty, incorporating social and economic development, protecting the environment and the

planet and ensuring full participation of citizens through the exercise of their democratic rights. SDG 3 establishes a specific horizon for the health and well-being of all by recognizing that good health is essential for sustainable development and serves as a framework necessary for addressing the determinants of health.

However, it is evident that national averages conceal the fact that some populations, groups and communities are being left behind. For instance, the 31-year difference in life expectancy between countries with shortest and longest life spans highlights the need for a multisectoral approach with a gender perspective and human rights-based focus to address inequalities and ensure equitable and universal access to quality health care.

Governability of the Global Health System

Strategic actors

Like at national level, the global health system incorporates a range of associated and interconnected actors. We have already mentioned the UN agencies which, based on their original mandates or new circumstances in global health, like UNAIDS that was created in the late 1980s to globally respond to the HIV/AIDS pandemic, interact autonomously and transversally with the WHO and support policy formulation and their implementation and operations in the field.

At global level, the inclusion of new non-state or hybrid actors around or within the WHO as part of a broad community of health organizations has been a long-standing debate, although a wide variety of these actors are gradually being recognized as part of the system. However, the formal governance of the WHO and the UN agencies remains in the hands of member states.

Thus, separate but around the WHO, public-private partnerships have been established to facilitate access to technologies, medical supplies, medicines and vaccines through funding and promotion of research, development, procurement or donations. Despite being autonomous, as they each have their own governing boards with the WHO as one of the members, they often utilize the WHO's management system.

The new non-state or hybrid actors include The Global Alliance for Vaccines and Immunization (GAVI); the Global Fund to Fight AIDS, Tuberculosis, and Malaria; Unitaid; PMHCH; the Access to Covid-19 Tools (ACT) Accelerator and its COVAX vaccine pillar; the Coalition for Epidemic Preparedness Innovations (CEPI); the GAIN in nutrition; Roll Back Malaria; the Stop TB

Partnership, and others.

Many of these entities receive significant contributions from the Bill & Melinda Gates Foundation (BMGF), which is a central actor in this new configuration who entered the stage in the early 21st century, while active efforts to seek innovative financing models were launched. Other philanthropic foundations, such as the Clinton and Bloomberg Foundations, also participate.

These new partnerships are comprised of a mix of donor state manufacturers or are headquarters of major producers of vaccines, supplies and medicines, like Great Britain, France, Norway and India; some aid recipient states, UN agencies or other multilaterals like the European Union; international non-governmental organizations (NGOs) like Oxfam, CARE and Médecins Sans Frontières, who are traditional partners of the system and representatives of specific communities of people living with certain diseases or vulnerable populations. Simultaneously, all these organizations participate in the World Health Assembly, but as observers. The possibility of a conflict of interest between non-governmental entities, profit or non-profit, and the WHO led to the formulation in 2016 of a framework known as FENSA (Framework of Engagement with Non-State Actors) (PAHO/WHO, 2016).

Against the backdrop of globalization, which has brought about advantages and disadvantages for different countries, the evidence of growing inequalities between countries and within countries makes the goal agreed upon almost 50 years ago in Alma Ata increasingly distant. Additionally, the geopolitical transformations of the world, transitioning from the post-World War II bipolar Cold War era to a unipolar dominance and finally to the multipolarity of the 21st century with the rise of China and the increasing fragmentation of the European Union, directly impacts in the realm of global health.

The serious controversy sparked by accusations regarding the origin of the SARS-CoV-2 virus and the handling of the WHO's relationship with China by the Trump administration, which resulted in the withdrawal of the US from the WHO (later reversed by the Biden administration), can be largely explained by the reaction of this and other states to their own ineffectiveness in managing the pandemic, fueled by nationalist and populist responses. This, however, does not minimize the damage to the credibility of the WHO. In addition, the agency has faced regular accusations of representing the interests of major powers or blocks rather than the common good, of responding to political pressures rather than technical ones, or simply lacking the capacity to react to serious situations such as the Ebola crisis in Africa (which also led to years of debate and proposals to adapt the mandate to this new vision).

As can be seen, the process of effectively incorporating new and multiple actors into the international system is still under construction.

Financial resources

Like all UN agencies, the WHO's budgetary mechanism revolves around the debate and approval of a biennial program-budget by the World Health Assembly. Although each country's contribution or quota is determined according to a formula that includes GNP, population and other factors, making for a variety of amounts, each country has the same formal political weight (vote) when it comes to decision-making. The sum of the quotas is known as the regular budget and is at the free disposal of the Secretariat. According to the formula, the US should pay about one-third of the budget. However, in the 1980s, the US announced that its maximum contribution to multinational entities would be limited to 25% of the total budget.

In addition to this arrangement and given the constant pressures for reforming the institution and the new demands of global health, the World Health Assembly decided not to increase the real value of the regular budget (adjusted for inflation). Subsequently, the real budget was limited to its nominal value, which means it was reduced by inflation.

Since its inception, the WHO has accepted extrabudgetary funds (EBF) for specific tasks requested by some member countries (vaccines, specific diseases, etc.). The freezing of the regular budget and the increasing demand for services have led to a growing dependence on voluntary contributions, initially limited to member states and later including other international agencies, as well as some foundations from the private sector.

These EBF considerably exceed the regular budget. For the biennium 2018-19, the WHO's budget was USD 6.017 billion, of which only 16% came from regular funds and 84% from EBF. For the biennium 2020-21, EBF accounted for 88% of the total, which likely reflects the urgency posed by the Covid-19 pandemic, compared to 80% in 2016.

According to the WHO's definitions, member countries are the main source of EBF (55%), followed by multinational agencies, including International Financial Institutions, with 16%, and then foundations like the ones mentioned before (14%). The for-profit private sector contributes 1%.

During the biennium 2018-19, the main contributors to the WHO were the US, the UK, the Gates Foundation, GAVI and Germany. Non-state entities only contribute to EBF, but it is worth noting that the EBF from major contributing member states is several multiples of their regular funds, except for the US, where both flows are similar. The contribution made by

the Gates Foundation to the WHO is notable, making it the third, or even second if GAVI is also considered, largest contributor to its total budget and it surpasses many industrialized countries.

For the biennium 2020-21, Germany became the largest contributor (17%), followed by the Bill and Melinda Gates Foundation (9.5%), the US (7%), the European Commission (6.5%), GAVI (6.4%), the UK (6%), the World Bank (2.5%) and Rotary International (2.4%) (WHO, 2019; WHO, 2022).

All contributions are welcomed but, although member countries approve the priorities of the WHO, parties that contribute more extrabudgetary funds and foundations like Gates or Rotary, which establish their own priorities independently, can bias the Organization's policies and operations. Naturally, the WHO does not accept contributions for topics outside its competence, but excessive dependence on funds allocated at will, can distort global priorities and favor some regions or countries more than others.

The WHO's dependence on voluntary funds has been raised as a problem for years and is cause for significant concern within the global Official Development Assistance (ODA) system. However, it seems unlikely that member countries will increase their non-specific contributions in the short term. Therefore, it is necessary to seek a governance mechanism that enables funding priorities to be set in a way that ensures the universality of the right to quality health while incentivizing the non-state or philanthropic sector to continue contributing.

Evolution of Mandate

The governance of the WHO has been affected by the changing nature of its interventions, like other UN entities. It was initially conceived as a regulatory entity, with sporadic meetings of government representatives being sufficient as governments themselves implemented the recommendations. However, with the decolonization processes of the 1960s and 1970s, the focus of the WHO shifted towards technical cooperation with emerging countries by placing a strong emphasis on national needs. From the late 20th century pandemics (HIV/AIDS, SARS, Asian Flu, Ebola, etc.) to Covid-19, WHO has been under increasing pressure to take a leadership role in the global management of emergencies. National interventions, no matter how well-designed and resourced, are insufficient to effectively address situations that require collaboration and coordination among countries and even continents.

The WHO has responded as well as possible by utilizing mechanisms that were not initially designed for this purpose, such as the disaster department,

which focused on natural disasters or conflicts/post-conflict situations. Although emergency response mechanisms have been strengthened since the Avian Flu, their speed and capacity to intervene have not been adequate, especially in cases where countries do not wish to have their situation analyzed. This discussion was further intensified during the Covid-19 pandemic and it remains to be seen how it will be resolved.

Lastly, new issues arise in governance of global public goods, such as financing and ownership of research and development of medicines, supplies and vaccines as well as the involvement of the public and private business sectors, scientific communities and communities affected by new diseases in health governance. These issues require in-depth consideration to establish a new governance framework, including intersectoral collaboration and other specific operational aspects of the system's governability.

Advancements and Innovations

As the international community acquires a more comprehensive vision of development in which health interacts, impacts and is influenced by adjustments in other areas of sustainable, fair and equitable development, this understanding has also driven the debate on financing sources and their distribution, both in global health and other areas of global development.

Between 2015 and 2018, a window of international agreements opened within the framework of the United Nations. It represented a civilizational impetus and an attempt at cooperation and regulation in major global challenges. In addition to the 2030 Agenda, the Paris Agreement on Climate Change was approved in 2015 and requires all countries to reduce greenhouse gas emissions that contribute to global temperature increase, to mitigate the effects and risks of climate change for the planet and humanity. Likewise, in 2018 the Global Compact for A Safe, Orderly and Regular Migration was approved in Marrakech and marked the first global agreement on migration governance by emphasizing the protection of regular and irregular migrants and reinforcing their contribution to sustainable development.

The XXI century began with the pioneering Millennium Development Goals (MDGs), which faced significant challenges in terms of financing and political momentum to achieve the 2025 targets as planned. In 2002, the United Nations organized the Monterrey Conference on Financing for Development in Mexico, seeking formulas and promises of financing and political dynamics to achieve the 2025 targets as planned. The presidents of Brazil, France and Chile, together with the UN Secretary-General, went beyond these efforts and launched the "Action against Hunger and Poverty" initiative in 2004. This shared leadership by the so-called "G-4" was a

crucial political step for the implementation of the Millennium Development Goals adopted in 2000, particularly in the field of global health.

This initiative did not get caught up in the controversy surrounding traditional instruments of external financing like Official Development Assistance or international trade. Instead, it focused on a flexible approach and concentrated on generating new additional sources of funding and implementing financing mechanisms that did not require consensus from all multilateral actors. The adopted mechanism of taxing air transport with a minimum fee per passenger, in addition to raising funds for the initiative, opened the possibility of reducing greenhouse gas emissions from air transport, thereby addressing global warming.

This laid the groundwork for political support in the subsequent United Nations Conference on Innovative Financing for Development in Paris in 2006 which established new standards for international development cooperation. It addressed a topic that had been discussed but that had not made a dent in the international community until then (like the Tobin Tax report on financial transaction taxes, under discussion for two decades). This led to the establishment of the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), a public-private multilateral entity with significant and sustained contributions from the Gates Foundation (which had already promoted GAVI, the global alliance for vaccines) to finance the needs of the most vulnerable countries in relation to those diseases.

The Global Fund marked the beginning of an era of international public-private collaboration and continues to develop various forms to address significant humanitarian and health problems that are solvable by innovative yet overlooked means. This is in line with the 2030 Agenda commitments and the challenges of the pandemic. It is worth mentioning that the Global Fund's governance includes equal participation on its board of directors of industrialized and developing countries, as well as foundations and individuals affected by the diseases, which makes it a hybrid model.

The G-4 countries, joined by Spain, Great Britain and South Korea, supported France's proposal to allocate a portion of the revenue from a solidarity tax on air transport to finance research and development of required yet inaccessible innovations in the fight against HIV/AIDS, tuberculosis and malaria in the world's most needy regions. This led to the creation of Unitaid, an autonomous entity under the auspices of the WHO, characterized by its innovative financing (with over 70% coming from the solidarity tax levied on airfares in countries such as France, Great Britain, Brazil, Chile and South Korea) and its use of funds to invest in innovative research and low-cost distribution of supplies and medicines through the joint efforts of donating and recipient governments, international and

national NGOs and industry members in different countries. The funds raised in France and Chile were initially allocated for 100%, in the case of France, to the Global Fund and for 50%, in the case of Chile, with the other 50% allocated to the promotion of domestic tourism. In Brazil, the funds were used to finance a major anti-hunger campaign. Faced with the Covid-19 pandemic, Unitaid has financed the distribution of billions of doses of Dexamethasone for the treatment of affected individuals in Africa. It also directs millions of dollars towards research and development of new diagnostic and treatment tools to help countries negotiate low prices for their acquisition and use.

This is part of a multilateral effort known as the ACT-Accelerator, which aims to share responsibility and risk between the international public and private communities. The COVAX facility, coordinated by the WHO and GAVI, is a key pillar of the ACT initiative and serves as a global mechanism for the joint procurement and equitable distribution of Covid-19 vaccines among the 20% most vulnerable countries and populations.

The most recent chapter in financing global public goods, particularly global health to combat the Covid-19 pandemic, came up in July 2021 at the G-20 finance ministers and central bank governors meeting in Venice as a response to the globalization and digitization of the economy. It was agreed, following a proposal President Biden made shortly after taking office, to create a global minimum tax for multinational companies that would generate over 20 billion euros in revenue and have a profit margin of 10% before taxes, regardless of their location. Former President Ricardo Lagos of Chile commented that “this implies a huge change in the global tax system and requires the G-20 countries to agree on an equivalent percentage charge for all. Some say it should be 15% on a 10% profit margin, and others, like Argentina and France, suggest increasing it to 25%” (Lagos, 2021). The G-20 generally approved this idea in October 2021, but at the time of this article’s publication the necessary mechanism has not yet been established (“G-20 leaders endorse global tax deal and pledge more vaccines for the poor,” 2021).

The situation in the Americas

Governance and resources of the PAHO (Pan American Health Organization)
The governance and governability of the regional health system in the Americas largely follow those of the global system. As mentioned, the International Sanitary Bureau in the Americas evolved from being an entity directly managed by the US Surgeon General (the country’s public health director) to becoming the intergovernmental agency for regional health issues in the Americas. Its first non-US director was Dr. Abraham Horwitz

from Chile, elected in 1958. For operational purposes, the Pan American Health Organization (PAHO) maintains a dual status as the regional office of the WHO in the Americas and the health agency of the Inter-American system, led by the Organization of American States (OAS). This situation only exists in the Americas.

The PAHO, which predates the WHO by about 45 years, has a regional governance mechanism very similar to that of the WHO, in with initial participation of only the health ministries of the countries in the region as well as the United Kingdom, the Netherlands and France, which are members of the PAHO because of their territorial possessions on the continent. Other entities like social security services have been incorporated later, but always within the government sector associated with health ministries.

As part of the Inter-American System, the PAHO maintains relations with different OAS agencies, subregional integration systems such as CARICOM and SICA as well as development banks like the IDB, CAF and ALADI.

Under this arrangement, the PAHO has its own regular budget funded by the countries in the Americas, in addition to a regular budget allocated by the WHO (approximately amounting to one-third of the total), which also comes from member countries' contributions, including the US. For the 2020-2021 biennium, the PAHO's total budget is USD 620 million, of which USD 215.8 million comes from the WHO. A constant point of discussion has been this dual financing of the PAHO. Unlike the WHO global membership fees allocation, for the PAHO the regular quota component from countries follows the OAS allocation formula, with the US contributing approximately 60% of the total. According to usual multilateral arrangements, each country has one vote in decision-making.

The PAHO has kept its revolving funds at a much lower level than the WHO to avoid excessive reliance on them, and it is expected that they will reach around 55% for the 2020-21 biennium (WHO, 2019). In addition, the PAHO manages rotating and strategic funds, which are focused on acquiring vaccines and supplies for public systems to consolidate demand and achieve better agreements with suppliers.

Covid-19 and governance in the region

The Americas have the highest number of Covid-19 cases worldwide, accounting for 48% of deaths, even though they comprise only 13% of the global population when including Canada, the United States, Latin America and the Caribbean. Except for the former country, the latter three sub-regions have experienced a high number of cases and deaths, the second and third waves of infections having been more severe than the first in most countries . With weeks difference, in one way or another, the pandemic

arrived with a strong impact on health, social, economic and even political aspects in all countries. Out of a total list of 80 countries, updated as of April 16th, 2021, notable in the region are Peru (#1), Mexico (#3) and Ecuador (#7) within the top 10 of highest excess deaths, and Bolivia, Brazil and the United States within the top 25%, positioning this continent as a leader in excess mortality (The Economist, 2021).

Rather than attempts at cooperation initially at regional level, some unfortunate comparisons were made between countries regarding their successes or failures in the early stages of the pandemic, followed by some efforts to exchange protocols and distribute emergency equipment as bilateral humanitarian aid, without this preventing a certain “race” from obtaining equipment and vaccines from exporting centers.

Regarding vaccine availability, some countries, such as the United States and Chile, have managed to meet their demand for doses through direct and early contracts with laboratories or domestic entities. As of April 9th, 2021, the PAHO reported that over 247 million doses had been administered in the Americas region, covering 24% of the population. However, only 28 countries had received them through the COVAX initiative, which delivered only 3 million doses globally, a very small proportion of the needs of even the poorest countries. Additionally, the distribution practices in certain countries, such as through private pharmacies, may lead to increased socioeconomic inequalities and delayed achievement of adequate coverage to prevent future lockdowns.

The differing responses within and among countries demonstrate a clear lack of cooperation and of space for technical and political dialogue to join efforts, share experiences and undertake common initiatives. Each country has indeed been operating independently, without considering others, which indicates a lack of collective action to build an influence center. This also points to weaknesses in guidance and support from the regional multilateral health and development organizations such as the PAHO and the IDB. Additionally, it takes place in an environment where the Americas, apart from a few countries, are considered a middle-to-high income region, which implies that it does not require as much resource support as other more vulnerable regions, like Africa or parts of Asia.

The PAHO, an organization expected to provide strong support in controlling any regional health emergency, has faced difficulties since the beginning of the pandemic - partly reflecting criticisms of the WHO -, especially after the United States declared its withdrawal from the organization and suspended its financial contributions. The United States is now normalizing its contributions to the WHO as well as the PAHO under the Biden administration.

Greater regional collaboration and integration during this pandemic would be an asset for addressing immediate and complex problems, such as border closures, economic speculation due to shortages of personal protective equipment and tests, international logistics management, control of new variants and equitable vaccine distribution. As highlighted by Chile's former President Ricardo Lagos, the question is why this region, with three G-20 members, seems to be lagging. (Lagos, 2021). We add: Could a new "G-4" of Latin America and the Caribbean promote a shared financing agreement for a distribution and/or production plan of supplies, medicines, vaccines and support for healthcare personnel that could bend the curve of the pandemic and establish sustainable healthcare systems?

Equally important is collaboration and agreement to jointly address longer-term problems, like collaborative production of drugs and vaccines, development and implementation of information and surveillance systems, joint work on technical and resource support, among other advantages of collective action vis-à-vis Covid 19.

These tasks, however, need to be viewed in the broader context of an increasing weakness of the integration mechanisms, dialogue and collaboration in the region, beyond the PAHO. The discontinuation or paralysis of institutions that were expected to promote progressive integration routes – such as the Hipólito Unanue Agreement, UNASUR, SICA and CARICOM – has made it more challenging to confront this crisis with strong, robust and adequately resourced mechanisms for mobilizing resources, reaching minimal political, economic and social agreements on how to address the crisis, negotiate with the private health sector (including laboratories), define public health and employment policies, etc. Covid-19 emerged in this region just as political regression and a growing weakening of political dialogue initiatives were evident, particularly in South America. The fabric of integration was distorted and in this scenario, economic, political and social vulnerabilities to face the crisis collaboratively or jointly increased.

It has been repeatedly argued that integration processes provide an opportunity to advance social and economic consensus, strengthen rights and define common objectives. Perhaps the challenge is exactly the opposite. The pandemic and its complex economic, social and political effects offer an opportunity to rebuild that much-needed regional framework for political dialogue, achieve perhaps simpler and more specific agreements instead of grand frameworks and ultimately activate the necessary health and well-being initiatives.

Final Reflections

Global multilateral governance is adapting and responding primarily to geopolitical and commercial interests, while paradoxically still wrestling between the conception of the sovereign state, which does not admit any foreign interference, and the multilateral state, open to establishing diverse international relations based on shared interests as a response to globalization that seem to have no alternative. This period of over 75 years since the end of World War II has been characterized by achievements in terms of human rights, like decolonization and the defeat of apartheid, and the increasing international codification of civil, political, economic, social and cultural rights, among which health, in a broad sense, is always linked to the right to life and well-being.

This global architecture or multilateral governance has since evolved alongside rapid globalization of international relations, trade and a broad spectrum of cultural dimensions, towards increasing complexities. On the other hand, other actors have acquired a position in the system, which has led to a profusion of governance systems rather than coordination among participants and, thus, undermines the leadership position of the WHO, which has not adjusted its governance to such change.

It is difficult to predict the future of global health governability given the constant tension between states protecting their interests and global issues (like pandemics), which require multinational actions of a public, private, community or multiple networks nature, be they international, regional, neighborhood-based or social. However, it can be anticipated that without a concerted effort by a broad community of nations and global actors to strengthen the existing multilateral architecture and its system of common objectives, norms and rules to achieve “health for all” and leave no one behind, we will face an increasingly uncertain world. Therefore, it is a collective task to unite efforts to function, if not at global level, at least within the Americas by adjusting governance as needed. Let’s not wait for the next pandemic to raise the issue again.

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3. Economic Inequality, Development and Global Health

Andrés Solimano Ratinoff⁴

The social and economic situation of countries is directly related, among other factors, to the health status of their population (Hertzman, 2001), even before birth (Barker, 1995). This relationship is widely documented in literature. The perspective of Public Health and Global Health predicts that more “developed” countries (those with higher per capita income levels and more advanced institutional frameworks) generally show much better health indicators than their counterparts with fewer resources (Haring, 2021). One explanation is that a higher level of income allows for more resources to be allocated to prevention and disease treatment in the health sector, which improves people’s health outcomes. In general, there is a positive correlation between health and nutrition indices and per capita income, although this relationship is not linear.

Income inequality within countries also reflects differential access to health services and quality of healthcare based on income, with wealthier middle-class sectors and high-income individuals obtaining better healthcare services than lower-income and poorer sectors.

Various mechanisms exist that mediate this relationship (health levels and the economic development of nations) at the population level. At conceptual level we have theories of allocation of public resources to the health sector, household decision-making regarding health spending, the availability of fiscal resources connected to the tax system structure and the overall development levels of countries. Complementary approaches include the theory of the construction of reality (Berger & Luckmann, 1966), the unintended consequences of actions considered beneficial (Merton, 1936), theories oriented towards the construction of health in the world, such as governance and biopower theories (Foucault, 2004) and the theory of suffering (Kleinman et al., 1997) and economic aspects of health determinants, the concept of commercial determinants of health (Kickbusch, 2012), which help us to better understand the relationship between economy and health⁵.

This article examines broad economic and social considerations in the relationship between economic development and health for Chile and the Latin American region from a historical perspective. A mostly economic approach including an analysis of income and wealth inequality is used as background for the understanding of Global Health issues addressed in this book.

⁴ Founder and President, International Center for Globalization and Development, CIGLOB.

⁵ See Haring, R. (2021).

The case of Chile and the Latin American region

The economic and social development of Chile in the past decades is a process with advances, contrasts and shortcomings. On one hand, the country has achieved a respectable level of income per capita close to USD 28,000 annually (2022) and shows a significant degree of macroeconomic stability, although this process of economic modernization is uneven (Solimano and Zapata-Roman, 2024). Chile is a member of the prestigious OECD group of mostly advanced economies, but it is simultaneously a country characterized by great economic and social inequality. This feature has its historical roots in the colonial period that was marked by unequal land ownership and valuable natural resources such as gold, silver, saltpeter and copper, which were mostly in the hands of foreign English or American owners, although several attempts at reducing inequality took place in the 20th century. Additionally, Chile's pattern of economic growth relies on the exploitation of non-renewable natural resources, agro-industrial and forestry products as well as maritime resources. Since the mid-1970s, the country has experienced a persistent decline in the relative importance of the manufacturing sector, a phenomenon known as deindustrialization.

Social spending financed by the State in healthcare, education, public transportation, pensions, science and technology and environmental protection is constrained by limited fiscal revenue and other public policy restrictions. As a percentage of GDP, fiscal revenues represent around 20 percent, much lower than the OECD average, which is closer to 35 percent⁶.

Health spending per capita in Chile is USD 2,200 (2018) in purchasing power parity, which represents approximately 8 percent of GDP and positions it on the upper range in Latin America and the Caribbean, after Cuba, Argentina, Brazil and Uruguay. Chile also has an extensive primary care network that has played a significant role in various public vaccination campaigns for decades, including the recent COVID-19 vaccination campaign.

The healthcare sector in Chile has a mixed system and consists of a segment of private healthcare (Isapres) and a segment of public healthcare (Fonasa). Which system to adhere to largely depends on the socioeconomic level of the affiliates, which replicates the inequalities observed at the macro-social level. However, Fonasa plays a leveling role in providing access to healthcare services for the middle class and lower-income populations.

⁶ Social spending competes with a level of military spending (over USD 5 billion in 2021) which is above that of its neighboring countries (Argentina, Bolivia and Peru, see Stockholm International Peace Research Institute, SIPRI 2022).

Chile is a highly segmented society with varied social circles that generally do not connect between each other and live in different economic, social, territorial and cultural realities. Economic elites and high-income groups reside in neighborhoods with houses enjoy and services that are not far from those offered in developed countries and they have access to high-quality healthcare services. The middle classes have made progress in accessing to a wide range of goods and services but also depend on loans and credits with banks and commercial stores to acquire them. They have acquired new homes, send their children to private schools and are exposed to the allure of consumer society but have incurred in high debts along the way. In turn, lower-income sectors composed of the working class and marginalized groups receive modest wages, are subject to job insecurity and live in unsafe neighborhoods, which has become generalized to other sectors as well. Furthermore, working class populations are also indebted with the financial and commercial sector. In terms of healthcare access, most of the population that receives their health services from the public sector is affected by long waiting lists for surgeries and more complex treatments. Additionally, in highly congested cities, particularly in the capital city of Santiago, most residents spend long hours commuting to and from their workplaces.

Neoliberal modernization in Chile has enabled access to material goods on a larger scale than in the past but a host of significant problems associated with this development strategy remain (see Solimano and Zapata-Roman, 2024). A great challenge for a post-neoliberal economic transformation project is building an economy that combines economic prosperity with social equality, better access to healthcare for the population and environmental sustainability within a more participatory democracy.

Income and wealth inequality

As mentioned, a structural characteristic of the Chilean economy and society is its high inequality in income, wealth, opportunities and access to social services, including healthcare. This inequality is reinforced by economic and institutional mechanisms that are difficult to change in the short term. In the past 50 years, income inequality reached its lowest levels during the Allende government but was reversed to its highest levels during the military regime. It has gradually decreased in the decades following the reestablishment of democracy but has remained high (by international standards), especially regarding wealth.

The Gini coefficient of income, a widely used measure of the distribution of gross incomes (incomes before taxes and transfers), is close to 0.50, a level internationally considered as high. On the other hand, the Gini coefficient of personal wealth is much higher and reaches 0.70,

according to calculations from the Household Financial Survey of the Central Bank of Chile.

Personal wealth is the sum of physical wealth, such as properties, land, vehicles, artwork, gold and jewelry, and financial wealth, including stocks, bonds, bank deposits and other financial assets. Net personal wealth is the total gross wealth minus the individual's liabilities (debts). An empirical regularity across Latin America and around the world is that wealth inequality (Gini coefficient of personal wealth) is substantially higher than income inequality (Gini for wages and salaries, interest, dividends, rents). Therefore, a comprehensive analysis of inequality must incorporate not only income distribution but also wealth distribution⁷.

The following factors contribute to and reflect the high and persistent economic inequality in Chile:

- a) a high concentration in the ownership of physical and financial assets by small economic elites and productive and financial conglomerates,
- b) the weakness and atomization of labor organizations, which prevent them from negotiating higher wages and receiving a fair share of companies' productivity gains,
- c) the absence of a progressive tax system that proportionally taxes higher incomes more,
- d) the absence of a wealth tax for high-net-worth individuals,
- e) the existence of a highly privatized and stratified education system, where access to quality education is largely determined by the socioeconomic level of families (ability to pay), which leads to persistent disparities in public education. Historically, from the 1940s to the 1970s, access to public education was an equalizing mechanism of opportunities and upward mobility in Chilean society,
- f) the high profits earned by companies operating in sectors with limited competition (banking, private pension funds, private healthcare insurance, natural resources).
- g) a segmented health sector in which private health providers (Isapres) that serve around 15 percent of the population co-exist with a public health system (Fonasa) for the remaining 85 percent of population.

Latin America: A Brief Historical Perspective

Latin America is a region that has maintained its ratios of per capita income

⁷ Available estimates show that the income Gini for Latin America and the Caribbean c. 2015-2018 was 0,46 while the net wealth Gini was close to 0,80. In turn, the income share of the top 1 percent was 20 percent (Latin American average) and the wealth share of the top 1 percent was 35-45 percent for those years.

roughly constant to advanced economies for several decades showing its difficulties for converging to higher living standards in the world economy. At the same time, its economies are prone to economic cycles associated with fluctuations in terms of trade, financial flows and the ups and downs of the global economy. These macroeconomic cycles have also been linked to expansive fiscal and monetary policies adopted by governments that faced limitations in foreign currency availability (known as the “external gap”) and generated balance of payments fragility, inflationary pressures and stop-and-go policies. Social policies face constraints in fiscal financing, which also affects the healthcare sector. Additionally, in certain countries (e.g., Latin American countries in the 1980s and Greece between 2009 and 2017) austerity measures and adjustments were accompanied by a reduction in public healthcare spending (Solimano, 2022, 2023).

A structural characteristic of the region is high inequality, which is a phenomenon with historical origins associated with the conquest of America. The Iberian colonization of the New World in the 15th century and beyond involved granting land and indigenous people, known as “encomiendas”, to conquerors and adventurers from the Old World. This led to the accumulation of immense agricultural wealth and lands containing precious minerals such as gold and silver, particularly abundant in Mexico (Viceroyalty of New Spain) and Peru (Viceroyalty of Peru), in the hands of a few, which contributed to pronounced economic inequalities in the territories of America (Solimano, 2021b). A significant portion of the gold and silver was transferred to the Spanish crown, specifically the Habsburg and later the Borbon families⁸.

The colonial era created a rigid social hierarchy consisting of *peninsulares* (white people born in Spain) at the top, accompanied by a dependent local ruling class known as *criollos* or the “creole aristocracy”. There was also a middle stratum composed of merchants, artisans and public officials, and a lower class comprised of laborers, indigenous people, mulattoes, black slaves and *zambos*. Internal economic inequality in Latin American countries did not change significantly after the wars of independence in the early 19th century and the formation of independent Latin American and Caribbean republics, though the dominant Iberian elites were replaced by local elites. Land ownership was based on large extensions of land known as *latifundio*, a system that had replaced the *encomiendas* after the Borbon reforms. The new ruling classes of the republics consisted of landowners, merchants, and local and foreign financiers and industrialists who thrived alongside an emerging domestic industry. Booms in primary product prices primarily benefited the mining, trade and

⁸ During the colonial period Latin American nations could only engage in (legal) foreign trade with the Spanish Crown; this system retarded economic development in Latin American and Caribbean countries and consolidated inequalities.

agricultural elites and not laborers, peasants and manual workers.

The very limited democracies of the 19th century in Latin America allowed for the political independence from Spain to be led by these new propertied and local elites, who experienced no serious challenges from excluded sectors. Sokoloff and Engerman show that between 1840 and 1900, the percentage of people who voted in elections (where the vote was not secret) did not exceed, at best, 5 percent of the population (Sokoloff & Engerman, 2000). Furthermore, only landowners and literate individuals were eligible to vote, i.e., the wealthier sectors of the population⁹.

Health services for the lower-income population were mostly provided by religious entities and mutual aid societies. Infant mortality rates were high and life expectancy did not exceed 40 years.

In the early decades of the 20th century, inequality fluctuated with economic cycles and recessions, the most severe one being the Great Depression of the 1930s, which heavily affected the economies of Latin America and the Caribbean. Chile, however, according to the League of Nations, experienced the most severe economic contraction in the world between 1930 and 1933 (Solimano, 2020).

Between 1940 and 1970, various Latin American governments adopted a strategy of import substitution and state-led industrialization, with private-sector participation, to reduce the economic vulnerability of countries to international fluctuations in main economic variables of trade and finance. Economic development was accompanied by a process of social modernization, including rapid urbanization, the expansion of public education, the strengthening of labor unions, an increased access for the middle class to the state apparatus and the creation of social security systems. Between the 1930s and 1950s, different Latin American countries established public health systems for their population and health indices improved.

In the second half of the 1960s and early 1970s, attempts were made at progressive income and property redistribution in Chile (under the governments of Frei Montalva and Salvador Allende), with similar policies adopted in Peru under the government of Velasco Alvarado. These policies also spread to Uruguay with the Frente Amplio of Liber Seregni and to Argentina with Cámpora and Perón. However, the wave of democratization and progressive redistributions in the southern cone was stopped and reversed by right-wing military coups in Chile, Argentina and Uruguay with the help of US intervention. The new military dictatorships adopted

⁹ Towards 1940, voting shares reached 15-20 per cent in Argentina, Uruguay and Costa Rica, as compared to voting levels close to 40 percent in Canada and the USA in those years.

neoliberal economic policies that benefitted the rich and wealthy and protected the economic interest of foreign investors.

Other events were the oil shocks of 1973 and 1979 that benefited Mexico, Venezuela and Ecuador, net oil-exporting countries, and the recycling of petrodollars allowed for increased investment and economic activity in several countries in the 1970s. However, the recycling of petrodollars to Latin America also contributed to the accumulation of higher levels of external debt that forced costly adjustment policies in the 1980s (Solimano, 2021a, 2021b, 2023)¹⁰.

External Debt Crisis, Adjustment and Neoliberalism

The high external debt accumulated in the 1970s along with external and fiscal imbalances led to the external debt crisis in the 1980s, which reduced the region's economic growth, accelerated inflation, contracted real wages and had serious effects on investment and employment. A report by UNICEF, a United Nations agency, titled "Adjustment with a Human Face," documented the deterioration in health indicators of the population because of the adjustment policies adopted in Latin America during the 1980s, including the reduction of social spending in healthcare.

In the 1980s, income inequality increased in Argentina, Brazil, Chile, Colombia, Peru and Paraguay, but decreased in Uruguay and Costa Rica (Cornia, 2015). International historical evidence shows that, in general, inequality tends to increase during and after economic crises (Solimano, 2020) and may decline in booming periods. In the following decade, the 1990s, inequality increased again and this time the trend was associated with the adoption of neoliberal economic reform policies known as the "Washington Consensus." These reforms focused on macroeconomic stabilization (e.g., shock treatment), privatization of public assets and companies and, in several countries, also the privatization of the pension system (Solimano, 2021b, 2023) as well as deregulation and opening of trade and financial sectors to the outside world. At the same time, labor unions weakened while business associations became stronger. Informalization of the labor market increased, and wage and benefit gaps widened between managers and high-level administrative positions on one hand, and middle-level employees and shop-floor workers on the other. Prices of assets such as stocks, bonds and properties also surged and benefitted wealth holders.

From the early 2000s, a post-neoliberal period of political change (the

¹⁰ The income Gini (average of 15 countries) went up from 0.503 in 1950 to 0.537 in 1990 and confirms the high levels of inequality in the Latin American region.

“pink wave”) occurred in Argentina, Brazil, Bolivia, Venezuela and Ecuador, where their governments strived to move away from Washington Consensus policies. The period between 2002 and 2012/13 showed a boom in the prices of primary commodities such as oil, copper, soybeans and various metals, which benefited Latin American economies that heavily relied on primary products for export. Post-neoliberal governments also intensified poverty alleviation programs and, in several cases, increased public investment. This period saw a cycle of higher economic growth and reduced inequality but not of economic diversification away from natural resource-based exports and reduction of overall external dependence.

Concentration of Economic Power and the Weak Redistributive Role of the State

The high concentration of wealth among the richest segments of the population leads to excessive influence of economic elites, who control a significant portion of financial and productive wealth and the ownership of mass media in countries, over public policies. Several mechanisms can be identified to exert this influence, such as donating to political campaigns, controlling media outlets and influencing experts and intellectuals (Solimano, 2022). Particularly in Latin America, economic elites have historically and presently effectively blocked progressive redistribution to deny increases in income and wealth taxes, which results in reduced fiscal resources for social sectors, including healthcare.

States in Latin America are weak in using the tax system and state transfers for correcting inequalities generated endogenously by the economic system. This is reflected by the fact that in Latin America, indirect taxation (value-added tax and specific taxes) accounts for about 50 percent of total tax revenue, which is in contrast with less than an equivalent share of one-third in the OECD. In the latter, the contribution of direct taxes (personal income and corporate taxes) to total state income is significantly higher than in Latin America. Moreover, social transfers have lower coverage compared to developed countries. The European welfare state, with universal provisions for healthcare, education and pensions, is associated with taxation revenues close to 35 percent of GDP, with Scandinavian countries reaching 50 percent. In contrast, the average tax-to-GDP ratio in Latin America is around 20 percent only. With fewer tax resources, the capacity to finance higher-quality and wider-reaching social expenditures¹¹,

¹¹ The average difference between the market income Gini and the disposable income Gini (market income adjusted for taxes and transfers made by the government) is 3-4 percent in Latin America. In contrast, in OECD countries, on average this difference is 12-14 percent, associated with State action through taxes and transfers.

including healthcare, is lower. It is a long-standing structural characteristic of the Latin American state to have an endemic inability to ensure that economic elites contribute more through taxes to finance social spending that benefits the poorest sectors. Naturally, healthcare spending also falls within this social expenditure.

Final Thoughts

One of the most important characteristics of inequality in Chile and the rest of Latin America is its persistence and continuity over time. This inequality is reflected in the healthcare sector where fewer resources are allocated both in absolute amounts and relative terms compared to nations with higher levels of economic development (an exception in the Latin American and Caribbean context is Cuba with a higher ratio of health spending to GDP than the average corresponding share given its per capita income level).

The colonial period laid the foundations for a significant inequality in land ownership and natural resources within socially stratified societies. After independence and the formation of independent republics in the 19th century, ownership of key physical economic resources remained in the hands of local elites which kept the high economic inequality in the now independent nations. Nevertheless, economic elites benefited from weak democracies with minimal electoral participation by the population at large that allowed these elites to maintain their concentration of economic and political power. In the 20th century, income inequality stayed high and even grew compared to the 19th century, with average Gini coefficients around 50 percent. The “great leveling” that occurred in Europe and North America between 1913 and 1970 did not take place in Latin America, despite advancements in electoral participation, democratization, autonomous development, expansion of public education and middle classes, the creation of social insurance systems, the expansion of public health and workers’ unionization. The 1970s were politically turbulent in Chile and Latin America. Waves of democratization and progressive redistribution early in that decade were followed by authoritarian retrogression and the adoption of the socially regressive neoliberal model. Inequality increased during the period of 1980-2002, which included the external debt crisis (1980s) and the implementation of Washington Consensus policies in the 1990s. However, in the first decade of the 21st century, several countries experienced a “post-neoliberal” shift, helped by improved terms of trade, increased capital inflows and remittances, a slight compression of the wage scale and increased cash transfers to the poor. As a result of these changes, the upward trend in inequality of the last two decades of the 20th century started to reverse between 2002 and 2012, with effects extending until 2018-19 before the onset of the Covid-19 crisis.

The distributive progress of the first two decades of the 21st century, including public health policies, has its limits due to the persistence of informality in the labor market and the lack of consistent policies oriented to building an effective social state in Latin America that guarantees social protection, the advancement of economic democracy and the upgrading of public education, public health, housing and pensions. In the last three decades governments have focused on poverty alleviation and partially improving income distribution. Reducing wealth concentration has been an absent goal and so has the improvement of the redistributive role of the Latin America State characterized by the lack of progressivity in the tax system and the fragmentation of social spending.

An effective pro-equity strategy for the coming years and decades should focus on providing good-quality jobs and decent wages and expanding access to healthcare, credit and knowledge for the population. Additionally, universal income floors for the active and passive population should be guaranteed within the framework of a comprehensive and consistent strategy to reduce structural inequality in the region.

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4. The Role of the Academia in Global Health

Giorgio Solimano Cantuarias, Leonel Valdivia Matus, Jorge Ramírez Flores

The field of Global Health as an academic discipline has gained greater recognition since the beginning of this century and, more specifically, since 2020 with the emergence of the SARS-CoV-2 pandemic. If there were ever any doubts about public health transcending national and continental borders, they have clearly dissipated. The discovery of SARS-CoV-2 and its rapid transmission on a global scale within a very short period, with dramatic consequences for the affected population, has provided a definitive impetus for the strengthening of Global Health.

The field of biomedicine has made significant advancements in managing the emergency: the rapid development of vaccines, sustained increases in epidemiological surveillance capacity, improvement in the quantity and quality of associated tests and progress in the efficiency of genomic sequencing. To a lesser extent, progress has also been made in treating the associated conditions. Numerous academic institutions have played a significant role in these advancements through partnerships unprecedented in terms of scale, with the participation of governments for financing and the private pharmaceutical industry for development and production. Obviously, this progress has been achieved within a global context, as countless national and global actors have been involved from the detection of the pandemic trigger to advancements in its control and treatment.

Certainly, we can assert that Global Health has made substantial and impactful contributions in science and the application of advanced knowledge and technologies. Nevertheless, when it comes to population-level interventions - such as metric modeling for precise risk predictions, fostering effective communication for behavioral change among the populace and implementing preventive measures necessitating a population-level, multisectoral and interdisciplinary approach grounded in collaboration - the desired impacts have not been fully realized.

Academic institutions with Global Health programs currently enjoy well-deserved recognition but also face significant challenges in the future due to epidemics and potential pandemics of diverse nature.

The research and teaching of Global Health

The field of Global Health is dynamic and evolving, which poses challenges for teaching and research worldwide. Efforts are required to incorporate these concepts and new competencies effectively (Sawleshwarkar & Negin,

2017). The current curricula in Global Health in universities across the Americas are considered inadequate, mainly due to their limited presence and unclear boundaries, and there is significant predominance of initiatives from the United States compared to other regions (Mendes et al., 2020). Despite the evident bias towards English-speaking countries, the academic industry in this field has grown significantly in the United States (Merson & Page, 2009). However, there are serious concerns regarding its real objectives, and there is a recommendation to emphasize global equity in its development (Adams et al., 2016).

Latin American Academic Institutions Network

Global Health education in Latin America emerged in the early 21st century, with an increasing number of universities offering teaching and conducting research in this field. In a meeting convened by the PAHO and the WHO in 2009 to discuss a new conceptual model on international health, the consensus was reached that Global Health had great growth potential and collaboration in Latin America. It allowed for a better understanding of global factors influencing population health in a context of profound social and economic changes. The National Institute of Public Health (INSP by its acronym in Spanish) in Mexico held the first course on Global Health in 2003, titled “Challenges of Globalization and Health in Latin America,” with participation of speakers from five continents. Since then, the INSP has continued to offer the course “Foundations of Global Health in Latin America” and established the Global Health Program in 2006 and has offered a diploma course in Global Health since 2009. It has also developed Global Health training for regular students in masters and doctoral programs and provided scholarships for short stays abroad.

Similarly, the School of Public Health at the University of Chile created the Global Health Program in 2010 and offers summer school courses on various Global Health topics and a diploma course for graduates. The program has attracted academics from many countries, including Canada, the United States and New Zealand. Since 2014, the University of Chile and other interested universities have offered an interdisciplinary doctoral, master’s and specialist physicians course in Public Health.

In Peru, the Faculty of Public Health and Administration at the Cayetano Heredia Peruvian University (UPCH according to its acronym in Spanish) has been offering the course “Basic Concepts in Global Health” since 2005, to provide students with a perspective on the challenges in Peru in this field. In collaboration with the University of Washington, they conducted the course “International Health, Global Health and Diplomacy” in 2012 for health professionals responsible for international cooperation in the Andean Pact and the Peruvian Ministry of Health. Additionally, the faculty offers a 20-month master’s program in Public Health and Global Health.

In Brazil, both the National School of Public Health/Fiocruz in Rio de Janeiro (ENSP/Fiocruz in Spanish) and the Faculty of Public Health at the University of Sao Paulo (FSP/USP in Spanish) engage in Global Health activities. The first course on “Global Health and Diplomacy” was held in 2009 by ENSP/Fiocruz, emphasizing the impact of globalization on health and international cooperation in Brazilian health policies. Recently, ENSP/Fiocruz implemented a diploma course and a professional master’s program in Global Health. At the same time, the Faculty of Public Health at the University of Sao Paulo offered its first Global Health course on “Bioethics and Global Health” in 2012 and has been offering a Ph.D. program on Global Health and Sustainability since 2013.

A brief overview of Global Health education in Latin American universities shows its unique characteristics compared to education in North America and some European countries. First, the courses mainly focus on the effects of globalization on population health and the health policies and systems of the countries offering them. Critical thinking and analysis of institutional frameworks and dominant power structures in contemporary society are prioritized. Second, the utilization of information and communication technologies (ICTs) enables remote learning and reaches a broader audience. Most courses target graduate students in public health and professionals interested in continuing education, with undergraduate teaching being an area for expansion. Interinstitutional and international collaboration are prominent features of Global Health education in our region (Solimano et al., 2013).

In the realm of research, the progression of Global Health has been somewhat sluggish, marked by a lack of distinct identity regarding research lines and a substantial cohort of dedicated researchers. Notably, the INSP in Mexico stands out as the institution exhibiting the most significant advancements in this domain as it delineates projects with a distinct “Global Health” focus that emanates from various research centers within the institute. Meanwhile, the FSP/USP has outlined two specific research lines within the Global Health ambit, and the UPCH has garnered support from the Fogarty International Center for its ongoing research initiatives. However, at the University of Chile, several proposals submitted for international funding from diverse organizations either await approval or are currently under review.

The formation of alliances, associations and networks has facilitated the establishment of collaborative relationships that were inconceivable in Latin America just 20 years ago. They are part of globalization and, when used effectively, can contribute significantly to the social and economic development of our societies. Health is not an exception in this scenario. The Latin American and Caribbean Alliance of Global Health, created in

2010, is a network of South-South collaborative academic institutions and emerged as a response to common health risks faced by their populations.

The First Latin American Congress on Global Health took place on April 9-11, 2010. It was organized by the National Institute of Public Health and held on its campus in Cuernavaca, Morelos, Mexico. The congress coincided with the 19th Annual Conference of the Global Health Education Consortium (GHEC). This international congress primarily aimed to foster the creation and strengthening of partnerships for education and research in Global Health by promoting regional cooperation between English-speaking countries in North America and Spanish and Portuguese-speaking countries in Latin America and the Caribbean. Notably, the event attracted 458 participants, 156 of whom came from Latin America. A total of 104 speakers participated, both conference attendees and presenters of scientific papers, of whom 51 represented Latin America.

During this inaugural congress, the ASAG (Latin American Alliance for Global Health) was established, with representatives from academic institutions in Mexico, Brazil, Costa Rica, Venezuela, Cuba, Nicaragua, Peru and Chile. From its inception, the Alliance set its ultimate goal to contribute to constructing programs and policies to promote equity in health and social justice in Latin America. The ALASAG is envisioned as a South-South collaboration network in Global Health that surfaced in response to common challenges and rooted in national realities, with deep respect for the idiosyncrasy and identity of the region's peoples. The ALASAG's ideology has been clear from the start, as it views Global Health as a way of perceiving and addressing health as a global public good, based on social justice and universal rights, revolving around equity, ethics and respect for human rights. It aims to advance the approach to Global Health in teaching, training, research and technical cooperation in Latin America through inter-institutional collaborations, with a vision to become the leading alliance for Global Health in Latin America and the region's spokesperson globally. Since its inception, ALASAG has successfully organized six congresses, and the seventh congress will be held in 2022, organized by the University of Chile.

- 1 First Latin American and Caribbean Congress on Global Health, Cuernavaca, Mexico, April 2010: "Alliances in Global Health, learning South-South collaborations".
- 2 Second Latin American and Caribbean Congress on Global Health, Santiago, Chile, January 2013: "Transcending borders for health equity".
- 3 Third Latin American and Caribbean Congress on Global Health, San José, Costa Rica, 2014: "Global Health in the Post-2015 Development Agenda, challenges from the Americas".
- 4 Fourth Latin American and Caribbean Congress on Global Health, Buenos Aires, Argentina, November 2016: "Technologies, global risks,

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- 5 Fifth Latin American and Caribbean Congress on Global Health, Medellin, Colombia, November 2018: “Global policies and their impact on Health: The Latin American perspective”.
- 6 Sixth Latin American and Caribbean Congress on Global Health, Rio de Janeiro, Brazil, October 2020 (online): “Sustainable development and Global Health: The challenges of inequality in the region”.

At present, the Alliance comprises eleven active academic institutions:

- 1 National Institute of Public Health (INSP), Mexico.
- 2 School of Public Health, “Dr. Salvador Allende G”, Faculty of Medicine, University of Chile.
- 3 Faculty of Public Health, University of Sao Paulo, Brazil.
- 4 National Faculty of Public Health, University of Antioquia, Colombia.
- 5 International Relations Center in Health, Oswaldo Cruz Foundation, Brazil.
- 6 Faculty of Public Health and Administration, Cayetano Heredia Peruvian University, Peru.
- 7 Center for Research and Studies in Health (CIES), National Autonomous University of Nicaragua.
- 8 Center for Studies on Diplomacy in Global Health, Isalud University (Cedisag-Isalud), Argentina.
- 9 Institute of Social Medicine, State University of Rio de Janeiro, Brazil.
- 10 Department of Public Health, University of the North, Barranquilla, Colombia.
- 11 School of Public Health, University of Costa Rica.

Global Health at the University of Chile

For instance, we can highlight the involvement of our School of Public Health “Salvador Allende G.” at the University of Chile in various international networks and collaborative agreements. The establishment of Global Health at our school was the result of expanding connections with other academic institutions in Latin America, North America and Europe during the first decade of the 21st century.

Prior to the formation of ALASAG, the PSG/UCHile (in Spanish) (Global Health Program/UCHile) actively participated in the American Public Health Association (APHA), particularly its International Section and the Trade and Health Forum. In this context, our program developed a special interest in investigating the detrimental consequences of economic globalization on Global Health, especially concerning global trade liberalization, in which Chile has participated since the mid-70s.

Furthermore, the PSG/UCHile has been engaged since its inception in the Consortium of Universities for Global Health (CUGH), which currently

brings together nearly 200 programs and academic institutions involved in global health activities, primarily in North America, but with a growing membership from institutions in the Global South. Additionally, the PSG/UCHile, representing ALASAG, contributed to the formation of the World Federation of Academic Institutions for Global Health (WFAIGH), a network of regional networks of academic institutions active in Global Health.

Several other networks have PSG/UCHile members participating to varying extents, including the Planetary Health Alliance based at Harvard University, the Consortium on Climate Change Education led by the Mailman School of Public Health at Columbia University in New York, the Global Network of Academic Public Health and the Global Health Program of the Association of Pacific Rim Universities (APRU) based at the Keck School of Medicine at the University of Southern California in San Francisco, CA.

Academy in Global Health initiatives

In the contemporary world, identifying and addressing determinants of global health conditions at the population and global levels has become increasingly crucial. Beyond purely health-related factors, the impact of international trade, the explosive development of information and communication technologies and the instant mobility of capital, with its effects on tradable goods, many of which are related to health, have acquired an importance that has not been sufficiently evaluated until now.

The significance of social determinants, which are becoming increasingly well-identified, is valid at local, national and undoubtedly global levels. In this context, the Sustainable Development Goals have established ambitious targets for 2030, the achievement of which is intimately linked, especially today and in the future, to significant progress in the prevention and control of global risks. Once again, academic institutions are essential given the nature of their work, and they are expected to play a significant role in these scenarios. The best example is their role in the emergence and presence of the coronavirus (SARS-CoV-2) pandemic worldwide. Undoubtedly, academic institutions dedicated to the study of global health can also learn to face new challenges in the medium and long term.

From the perspective of global health, it can be observed that no country was sufficiently prepared to handle a pandemic of the magnitude of Covid-19. The characteristics of the virus, with its asymptomatic transmission and long incubation period, make quick detection difficult.

Therefore, the academia can and should compare experiences with their successes and failures in various national and regional context to contribute from a global health perspective.

Due to the nature of their work, as mentioned earlier, academic institutions tend to be part of regional and global networks that offer an effective means to create solidarity for cooperation and to influence governments and multilateral institutions for better management of current and future pandemics and non-pandemic diseases, as well as their consequences. In a recent interview with Howard Bauchner, editor-in-chief of the Journal of the American Medical Association (JAMA), Prof. Peter Piot, director of the London School of Hygiene & Tropical Medicine (Bauchner, 2021), who himself was infected by the virus, highlighted the issue of inequality in vaccine distribution worldwide, where high-income countries obtain vaccines for two or three times the size of their population, while low-income countries are only now gaining access to vaccines far below their needs. Dr. Piot makes the radical statement that the “attitude of wealthy countries is as problematic as the continued emergence of new variants of the virus” and appropriately calls on academic institutions to become critical and accountable in the arena of global health at national, regional and global level.

The role of academic institutions in Global Health is widely known and recognized in Chile, the Americas and the world. Academicians from these institutions are constantly sought by the media and invited, though not always heard, to participate in expert panels of various natures. Therefore, it is not necessary to dwell on their performance during the pandemic, but rather to identify, as previously mentioned, the lessons learned and possible post-pandemic scenarios that will undoubtedly challenge institutions dedicated to the study and practice of Global Health.

In the coming months and years, the role of the academia in addressing various issues related to Global Health, including the Covid-19 pandemic, will be crucial in identifying, characterizing, objectively measuring and disseminating the lessons learned. Similarly, it is foreseeable that the field of Global Health studies will include new or reformed content in its teaching, research and engagement with the community.

New forms of teaching, research through innovation, the growing development of interdisciplinary and transdisciplinary approaches to address old and new problems, globalization and internationalization of university relationships, not to mention the communication revolution, have given rise to new scenarios and paradigms. This implies embracing profound changes in the way our universities operate and their institutional framework, a task that needs to be addressed without delay.

Are our universities taking on this challenge with the necessary conviction and urgency? To some extent, yes, but it is evident that more is needed, and for that, the commitment and collaborative work of their communities, from leadership entities to basic units, are essential.

Where does the academia stand in this scenario? It is a difficult question to answer, but important and necessary to address. The opportunities provided by congresses, seminars, faculty meetings and development plans, along with fruitful national and international exchanges, are privileged spaces to tackle this challenge. To open a space for reflection, we will mention just three areas to consider in an innovative reform of every School/Institute of Public Health in the Latin American region. Undoubtedly, there are more:

1. Robust academic bodies that possess high academic degrees and schedules that allow sustainable teaching, research and engagement with the community are indispensable. As this is not easy, development plans should prioritize it in the short and medium term.
2. Academic institutions, particularly Schools and Institutes of Public Health, are privileged spaces to proactively work with diverse actors, including governments, civil organizations and international organizations, because of their identity and the nature of their work. In other words, they must contribute with new knowledge and innovative proposals to improve the health situation of the population in our countries.
3. Strengthening interdisciplinary and transdisciplinary work both within and outside our units is crucial in these times, and achieving it requires a panoramic vision of the problems to be addressed and their possible solutions, as well as the training to be provided and the research to be conducted.

Future Perspectives

After this synoptic view of the role of the academia in Global Health, it is worth asking about the challenges in terms of policies, programs, research and innovation and human resources training in the new social, political and economic reality that our countries have faced in the last two decades of this century. The challenges are significant, as are the opportunities, so they need to be addressed with a future-oriented vision (Solimano & Valdivia, 2020).

Without aiming to be exhaustive or prescriptive in an article like this, we venture to outline a set of global areas that need to be considered in the present and near future:

- Assessing the effects of economic globalization in Latin America and its impact on equitable access to health and well-being for the region's populations.
- The urgent need to deepen South-South cooperation from and within Latin America.
- The critical analysis of external aid programs (charity vs. rights).
- Patients vs. patents, ensuring the protection of intellectual property rights of pharmaceutical companies and their impact on access to medicines.
- Protecting health as a right versus health as a commodity.
- Critically analyzing the adherence to and implementation by our governments of international agreements for the health and well-being of the people.

Concerning adherence to international treaties, a recent editorial in the journal *Science*, when evaluating the power dynamics among nations in the context of securing Covid-19 vaccines and therapies, offers a critical analysis of international cooperation in Global Health (Fidler, 2020). Similarly, an article in *Foreign Affairs Latin America* asserts that the Covid-19 pandemic has exposed the vulnerability of a fragmented Latin America, operating under the principle of “every man for himself”, which results in human lives paying the ultimate cost (Fortin & Heine, 2020).

When augmenting these noteworthy observations with the apparent frailty of nearly all inter-American integration and cooperation institutions, the inevitable conclusion arises that those alliances, including ALASAG, must solidify over time and geography as a contribution to enhanced health cooperation among regional countries. This is intricately linked to the ongoing struggle against inequalities and the cultivation of a robust public voice.

In this context and with a forward-looking perspective, our institutions must refine their academic pursuits in human resources training. This involves updating academic work, promoting relevant research and fostering deepened transdisciplinary and interinstitutional collaboration at both national and regional level (Solimano et al., 2013). Achieving this requires supporting local and national initiatives, primarily by formulating competitive projects to access national and international funding. Additionally, active participation in forums, congresses and other events, coupled with the publication of scientific articles in indexed journals of mainstream currents, becomes imperative for sustained influence and contribution.

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PART II.

MAIN RISK FACTORS FOR HEALTH ON OUR PLANET

5. An integrative view on the relationship between globalization and the environment

Karla Yohannessen Vásquez

The environment, from a simple and anthropocentric perspective, can be considered as the external or what surrounds human beings; however, there are numerous definitions of the environment. The United Nations has defined the environment as the “totality of external conditions that affect the life, development, and survival of an organism,” considering the naturally produced physical environment, on which humanity fully relies for all its activities, in its context. Due to this dependence, the care of the environment is of vital importance for all organisms, living beings, and ecosystems, including human beings.

On the other hand, globalization in its broadest sense can be understood as a process of global integration, which, in various ways, affects all areas of human activities. The process of globalization as a process of internationalization has several dimensions, such as economic, social, political, informational, and cultural, among others, which manifest themselves in greater interdependence between nations. The economic dimension of the globalization process is associated with the liberalization of economic relations linked to the growing importance of international trade and foreign direct investment. Society perceives the economic dimension of the globalization process as mainly related to macroeconomic indicators such as economic growth and employment; on the contrary, this dimension is rarely perceived as an essential factor that influences environmental quality and sustainable development of a country, as it leads to a greater use of resources and energy.

This chapter is divided into 3 sections. The first section describes the factors that exert the main pressures on the environment in the globalization process, with emphasis on the economic dimension. The second section identifies the main environmental consequences linked to globalization, and the third discusses future challenges for a healthy and sustainable planet.

Globalization and factors pressuring the environment

Economic globalization has an impact on the environment and sustainable development in a wide variety of ways and through a multitude of factors. The identification of factors linked to threats to the environment requires evaluating the pathways that contribute to the deterioration of environmental quality, which will be described below. However, it should be noted that the process of globalization theoretically leads to the transfer of pollution from one country to another, while the volume of pollutants in the global environmental system remains unchanged.

Economic growth and overexploitation of resources

The positive effects of the globalization process arise when the increase in economic activity is reflected in economic growth and development in the country where investments are made. The negative impacts, especially of foreign investments, often involve the elimination of competition through the acquisition of local companies in the host country, displacement of local producers and unequal competition between foreign and domestic companies due to different investment incentives, among other impacts. All of these contribute to the expansion of production activities, which must not only meet the internal needs of a country but also those of exportation, which results in the overexploitation of resources and causes land degradation, increased emission of hazardous pollutants and greenhouse gases (GHGs) and pollution from industrial waste, among others.

Figure 1 (a) at the end of the chapter shows the temporal evolution of globalization (represented by the KOF Index of Globalization, available since 1970) and the evolution of various indicators for Chile between 1960 and 2018. It can be observed that, up until 1985, Chile maintained average levels of total globalization (50 points) and from the 1990s onwards, its Globalization Index increased and stabilized at 80 points by 2010. The imports and exports of goods and services (as a percentage of GDP) steadily increased between 1970 and 1990, with a decline and stagnation in the following decade, and since 2000, it has shown a significant increase again (Figure 1 (b)). The ecological footprint, which measures the impact of human activities on the environment, showed a steady increase from the 1990s and reached values of 4.5 global hectares per person (Figure 1 (c)); furthermore, it is observed that in Chile, as of

2010, people's demands on the biosphere have exceeded its capacity to meet those needs. Emissions of CO₂, one of the main GHGs, in Chile showed a steady increase from the 1990s and reached over 80 thousand kilotons annually in 2017 (Figure 1 (d)). The evolution of all these indicators coincides with the increase in the globalization index in Chile.

Suresh (2003) described the logic of globalization as the expansion of trade and investment in search of new markets and more competitive production sites; that is, a tendency of multinational or transnational companies to geographically relocate and establish production units in countries with cheaper labor, more lenient health and safety requirements, lower environmental protection standards and favorable taxes, with the purpose of maximizing profits. At the same time, the growing power of multinational corporations is reported to have skewed the distribution of profits towards corporations, thus undermining the authority of national governments and civil society as well as human rights and environmental protection, and influencing the proliferation of laws that have favored trade and investment.

Generally, when private costs become the basis of market decisions, social costs are considered minimally or not at all. This generates market failures that lead to overexploitation of natural elements and high levels of pollution. These market failures primarily affect the environment: critical resources such as water, wood, oil, fish and coal tend to be undervalued, while ecosystem services such as flood prevention, water retention, carbon sequestration and oxygen supply are not valued. This undervaluation or lack of valuation leads to the overexploitation of natural resources and elements, and economic actors and decision-makers may ignore some or all the environmental costs incurred.

Economic growth and increased energy use

The expansion of production is also associated with increased energy demand. This implies greater environmental degradation through increased use of energy sources and the consequent emission of greenhouse gases (GHGs) and other pollutants. While improvements in production technologies could reduce environmental degradation, as environmentally friendly technologies may become more accessible through the globalization process, these technological advancements could increase energy demand and lead to a greater environmental burden. A study by Sethi et al. (2020), who examined the relationship between CO₂ emissions, globalization, energy consumption and economic growth in

India, reported that a 1% increase in the KOF globalization index resulted in a 0.18% increase in per capita CO₂ emissions and concluded that globalization, economic growth and increased energy consumption contribute to short-term environmental degradation.

In South America, most countries have experienced an increase in the globalization index at the expense of higher electricity consumption, increased CO₂ emissions and a larger ecological footprint. Figure 2 (at the end of the chapter) shows these three indicators in relation to the KOF globalization index in five South American countries for the years 1984 and 2014, which presents the change that occurred over 30 years. Figure 2 shows that all countries have experienced an increase in the globalization index, Chile and Peru at the top. However, Chile shows the highest increase in CO₂ emissions, electricity consumption and ecological footprint when comparing both periods, while Argentina was the only country to maintain its ecological footprint almost unchanged.

Increased population incomes are related to increased consumption of goods and services

The increase in population incomes due to economic growth leads to increased consumption of goods and services. The negative effect of this is the increase in production, the generation of commercial and household waste and the emission of polluting gases and GHGs, which cause environmental degradation. Aluko et al. (2021), who studied the effect of globalization on environmental degradation in 27 countries, reported that a 1% increase in per capita GDP led to a 0.86% increase in environmental degradation due to increased demand for goods and services, which puts additional pressure on the environment through increased production and energy consumption. In summary, this increase in population consumption exacerbates the described factors, which generate an endless cycle that degrades the environment.

Consumption and production patterns are the fundamental cause of environmental deterioration. The increase in per capita consumption has driven an exponential growth in human production and consumption of everything, from motor vehicles to synthetic fertilizers, paper and plastic to the use of water and energy. Individually, the consumption of one single person may have little impact on the environment. However, cumulative consumption, which multiplies similar behaviors by millions or billions of people in a population, has direct and powerful environmental impacts on the planet's natural systems.

Conventional economics praise consumption as the engine of economic growth that satisfies human needs and desires. This, combined with the

global spread of consumer-based lifestyles through advertising and entertainment media, has successfully encouraged consumerism and fueled aspirations to attain consumer status in a world where there is no limited “right to consume”. In an increasingly unequal world, per capita consumption data hides considerable variations in people’s ways of life. For example, per capita rates of energy, water, food and material consumption are relatively stable in the developed world, but are very high compared to developing countries. In rapidly industrializing countries like China and India, per capita consumption is comparatively modest but grows rapidly as poverty decreases. In less developed countries, mainly in sub-Saharan Africa as well as Afghanistan, Yemen and other Asian countries, per capita consumption levels and trends are more varied but generally low and increase slowly. Therefore, it can be assumed that there are hardly any significant trends towards declining per capita consumption in any country in the world.

From another perspective, it has been reported that higher incomes in the population create conditions for increasing pressure to improve environmental quality, which has been described by Grossman and Krueger (1991) through the environmental Kuznets curve. This curve expresses the relationship between pollution levels and per capita income. With an inverted U-shape, the curve indicates that economic growth can cause environmental problems in poorer countries, but these problems tend to plateau at a certain stage and gradually decrease because the “demand” for environmental quality tends to increase with higher incomes. The validity of this curve has been questioned by many researchers as they argue that it is not generalizable to all pollutants, like CO₂, whose emissions do not decline at any known income level. Therefore, it is important to reflect on whether it is a good idea to sacrifice the environment to the point where people or nations begin to “demand” better environmental quality, without considering that the current environmental deterioration and damage may be irreparable.

The Kuznets curve loses validity again when considering that a nation’s population can be responsible for environmental pollution far beyond its borders as a when it manufactures the products it consumes through production in other countries. In this way, consumption by high-income countries can directly contribute to the pollution problems of low-income countries, like when polluting industrial facilities are located in low-income countries and waste ends up in landfills in developing countries.

In summary, the increase in economic activities due to globalization puts pressure on the environment through the overexploitation of natural resources, the emissions of dangerous pollutants and greenhouse gases

and the generation of industrial, commercial and household waste. All of this leads to intensified ecological imbalances and climate change and results in economic costs and welfare losses for society, especially in developing countries where a significant portion of the population relies on agriculture and other climate-sensitive sectors. Below, we will describe the most relevant specific global environmental impacts that have occurred due to the increase in globalization and international treaties that have attempted to address these impacts.

Globalization, environmental consequences, and efforts to resolve them

In the past 50 years, the world has been drastically transformed by an explosion of global trade and increased consumption, which is causing the destruction and rapid degradation of nature in a world where natural resources are being overexploited at an unprecedented rate.

Six specific global environmental problems are examined: a) threats to wildlife, b) loss of biodiversity, c) ecosystem degradation, d) depletion of the ozone layer, e) environmental pollution and f) global warming.¹² We will include a description of the problem, international cooperation versus sovereign control, cultural assessments of the need for environmental protection and environmental concerns versus economic development.

a) Threats to wildlife

The most visible victims of the environmental problems caused by globalization are animals. They face a range of threats stemming from human economic activities, including the degradation of their habitats and the direct extinction of thousands of species. The threats most closely related to international trade are the trade in animals and the spread of invasive species.

The **trade in animals** is a vast and lucrative industry worldwide. According to the World Wildlife Fund (WWF), in 1976, the legitimate international wildlife industry had an estimated value of USD 300 billion and involved hundreds of millions of individual animal specimens. However, a significant portion of the wildlife trade is illegal. Rare and endangered animals and plants are often transferred from wild habitats in low-income countries to buyers in high-income countries through well-organized smuggling networks. These animals are used in medicines, for

¹² Editor's note: Due to their relevance to global health, two of these problems will be analyzed in greater detail in other specific chapters of this book: biodiversity loss and climate change.

their skins and as food, pets and collectibles. The increased ease of transporting and selling these animals is just another example of the consequences of globalization for the environment. According to the WWF, illegal trafficking and commercialization of wildlife is one of the fastest ways to drive a species to extinction.

The international community responded to the need to regulate the trade in wildlife by establishing the Convention on International Trade in Endangered Species (CITES), which came into effect in 1975. Over 5,000 species of animals and 30,000 species of plants are currently protected by CITES, whose aim is to ensure that the international trade of wildlife does not pose a threat to its survival. More than 175 countries, including Chile, are party to CITES. In general terms, this convention seeks to regulate, rather than prohibit, the cross-border transfer of species facing conservation issues. These regulations apply to live animal and plant specimens, as well as all their parts and derivatives, such as preserved animals, skins, bones, feathers, skulls, trophies, tissue samples and other biological materials, pharmaceutical products and ivory.

The regulations on international trade imposed by CITES only apply to species included in any of its three lists of species. In other words, specimens not included in the lists, and consequently not covered by the Convention, are not subject to the restrictions established by CITES but are subject to each country's internal trade regulations and zoo/phytosanitary regulations. For example, in Chile, the administrative authorities responsible for this are the Agricultural and Livestock Service (SAG, wildlife), the National Forest Corporation (CONAF, terrestrial flora), and the National Fisheries and Aquaculture Service (SERNAPESCA, hydrobiological fauna), which rigorously enforce domestic laws related to CITES. In contrast, some countries like Thailand, Indonesia and India are criticized by environmental groups for having weak internal regulations.

Some non-governmental environmental organizations advocate for going beyond CITES and aim to establish international controls for the protection of animals within countries. However, nations have resisted such an idea because of the alleged invasion of their sovereignty such controls would represent. On the other hand, wildlife trade has also provoked a counterreaction from animal-rights advocacy groups, which, in turn, show some interesting characteristics of environmental awareness in a globalized society.

Examples of this can be seen in campaigns to protect various species from commercial exploitation, such as "fur is murder", "save the dolphins", and "save the whales", in order to shift the demand for wildlife-derived goods

and urge people not to acquire/consume such products. These campaigns demonstrate the ability of environmental groups to organize activists worldwide through the Internet and influence policies at national and international level, which, in itself, is another characteristic of globalization.

The problems faced by animals in a globalized economy exemplify the issues that repeatedly arise throughout this section. Regarding international trade in animals, governments have agreed on an international treaty to cover the legal trade in animals, but illegal trade remains profitable, and national protection of animals within countries' borders has so far escaped international concern.

Invasive species (also known as exotic or non-native species) have been defined as “species whose establishment or expansion threatens ecosystems, habitats or species by being capable of causing harm to one or more components of the ecosystem”. Exotic species are plants, animals and microorganisms accidentally or intentionally introduced by humans into an area where they do not naturally appear. When introduced into a new habitat where they are able to survive, these species quickly dominate the natural wildlife and cause loss of biodiversity and imbalances in the ecosystem. The increase in travel, migration and international trade has made it difficult to manage these exotic species and has led to a large number of species entering societies.

Farmers and fishermen in developing countries, who depend on the survival of their crops, incur costs due to damage caused by invasive insects or plants that harm their products. The US Forest Service reported that invasive plant species cover over 40 million hectares, which forces farmers to spend billions on pesticides and results in an annual loss of USD 34.7 billion in agricultural productivity and wildlife. In Chile, examples such as the European bumblebee, acacia trees (aromos), beavers and the yellow jacket wasp have affected the country by causing damage to native species and economic costs for agriculture and other activities such as tourism. According to the United Nations Environment Program (UNEP), the total annual cost of invasive species to the global economy is USD 1.4 trillion, which limits the UN Millennium Development Goals on poverty.

The recognition of the importance of biodiversity for the planet's global health came with the creation of the Convention on Biological Diversity (CBD). The CBD has been signed by 195 states, including all UN member countries, except for the United States and the European Union. Chile has also been a party to this convention since 1995. The CBD establishes three main objectives: the conservation of biodiversity, the sustainable use of its

components and the fair and equitable sharing of benefits derived from the use of genetic resources. During the CBD Conference of the Parties held in Nagoya, Japan, in 2010, the Strategic Plan for Biodiversity 2011-2020 was adopted, which included the Aichi Biodiversity Targets. The Aichi Targets were formulated in relation to the 5 strategic objectives of the plan and totals twenty main targets to be achieved between 2015 and 2020. Regarding invasive species, strategic objective B, target 9, specified that “exotic invasive species will be identified and prioritized for control or eradication, and measures will be established to manage entry pathways and prevent their introduction and establishment”.

As a member of the CBD, Chile has developed a National Biodiversity Strategy (ENB) 2017-2030 and a National Action Plan. Control actions for invasive species in terrestrial areas are mainly carried out by SAG and CONAF, while Sernapesca and two other entities are responsible for aquatic areas. Currently (until March 2022), a bill that creates the Biodiversity and Protected Areas Service and the National System of Protected Areas is in its second constitutional process (Environment and Natural Resources Committee, Chamber of Deputies). This bill was introduced to the Senate in 2014 and was only approved in 2019. It defines invasive species and the functions of the new service to develop and implement prevention, control and eradication plans for invasive exotic species. The Ministry of the Environment would play an active role in controlling invasive species that threaten biodiversity and ecosystems. There is still much to be done in Chile, but fortunately, the government that took office in March 2022 made this bill one of the nine top priority legislative matters, aiming to fulfill their commitment to environmental care, which will be a relevant part of the government agenda. This way, the bill is getting closer to its final approval.

Despite the efforts of some countries, invasive species are likely to be a persistent and growing problem in the future worldwide and UNEP has described this problem as the second most significant threat to wildlife, after habitat loss.

b) Loss of biodiversity¹³

The CBD defined biodiversity, or BD, as “the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; it includes diversity within species, between species and of ecosystems”; in other words, BD encompasses plants and animals, how they interact with each

¹³ Editor’s note: More about biodiversity and Global Health, in the corresponding chapter.

other and how they interact with the natural environment they live in. Loss of BD is occurring at two levels. Firstly, plant and animal species are becoming extinct at an unprecedented rate that far exceeds the natural historical rate and, secondly, entire ecosystems in coastal and marine areas, continental watersheds, forests and drylands (deserts, grasslands and savannahs) are being destroyed by pollution, land conversion and climate change. The global Living Planet Index developed by the WWF, based on population trends of hundreds of species and their percentage changes measured in terms of abundance since 1970, in the latest 2020 report showed an average collapse of 68% in the analyzed populations of mammals, birds, amphibians, reptiles and fish between 1970 and 2016.

The loss of BD is important for numerous reasons:

- i) Living organisms provide irreplaceable environmental services that humanity critically depends on, such as maintaining fertile land, absorbing pollution, decomposing waste and pollinating crops.
- ii) BD supports human health by facilitating the development of medicines. According to UNEP, nearly half of the top 25 selling drugs in the world have natural origins, and it is estimated that such naturally sourced pharmaceutical products have a global market value of between USD 50-75 billion annually.
- iii) BD provides genetic resources for food and agriculture. The unique and lucrative human capacity to domesticate and breed more productive animals and crops, such as chickens that lay more eggs and drought-resistant maize, relies on the genetic diversity within these species.
- iv) Many people protect BD for ethical and spiritual reasons. John Muir, an American naturalist, wrote in 1912, “Everybody needs beauty as well as bread, places to play in and pray in, where nature may heal and cheer and give strength to body and soul alike.”. The WWF also argues that it works to protect endangered animals and plants, in part simply because they are “beautiful and rare”. Therefore, for many groups of people, including indigenous peoples, the preservation of nature is a valuable end in itself.

Again, the primary global instrument for biodiversity protection is the Convention on Biological Diversity (CBD), which explicitly recognizes that the conservation of biodiversity is a common goal of humanity and the fundamental basis for the development process. The CBD has three mechanisms to promote biodiversity: an information exchange hub for technical and scientific cooperation, a national reporting process on measures taken for biodiversity and a financial provision that aids developing countries in this effort.

The CBD advocates for several guiding principles that countries should consider: the use of a holistic and multisectoral approach involving cooperation between government, civil society and businesses, the recognition of the value of local knowledge in promoting the sustainable use of biodiversity, and the understanding that economic and institutional factors often underlie biodiversity loss. However, the CBD has been criticized for not being an action plan but rather a commitment device, therefore it presents few specific procedures, does not establish concrete goals and lacks lists or annexes related to protected sites or species. Therefore, the responsibility for determining how most of its provisions will be implemented at national level lies with the parties themselves.

One of the mechanisms for implementing the CBD is the formulation of the National Biodiversity Strategy and Action Plans, which are policy instruments in each signatory country of the Convention to appropriately integrate biodiversity concerns into relevant sectors of national development. In 2018, Chile approved the ENB 2017-2030, which is a public policy instrument that establishes the main strategic guidelines and national targets for the conservation and sustainable use of biodiversity until 2030. It is a relevant element for coordinating efforts and ensuring effective feedback between global and national objectives in favor of biodiversity protection, equity and social well-being. This document emphasizes that one of the main challenges is to complete and consolidate the existing environmental institutionality through the creation of the Biodiversity and Protected Areas Service and the National System of Protected Areas, which, as mentioned, have been awaiting approval since 2014.

Unfortunately, the CBD Secretariat has reported that, despite being parties to the CBD, too many countries lag behind in creating, implementing and managing their own national strategies and action plans for real change to occur.

Biodiversity loss is an international problem being addressed through international cooperation; however, there are disagreements among nations about the best way to address the issue. Nevertheless, its importance is such that UNEP estimates that a significant portion of the global economy is dependent on products and biological processes directly related to biodiversity. In other words, biodiversity is the foundation for a wide specter of industries, ranging from agriculture and biotechnology to fisheries and ecotourism. Therefore, the proper utilization of biodiversity at all levels - genetic, species, and ecosystems - is a prerequisite for achieving sustainable development.

c) Ecosystem degradation

Ecosystems are the entire network of relationships between a particular environmental habitat and the plants, animals and humans that depend on it. However, some of these ecosystems are not under the control of one or more nations. So, who should be responsible for protecting these areas? At the same time, some ecosystems are under the control of a nation, but that nation may not have the resources or inclination to protect them. Should countries be concerned about environmental damage in another country that does not have clear cross-border effects (without affecting the sovereignty of that country)?

Oceans are an example of these problems. They are used for economic activity, recreation and sustenance in many nations worldwide. However, since they do not belong to a single nation, oceans can be considered the “common heritage of humankind”, a resource that is not owned by anyone but used by all, and which can eventually be irreparably damaged because no one takes responsibility to protect them. This situation can turn into a tragedy due to the dependence of all human beings on the oceans.

As they cover approximately 70% of the Earth’s surface, oceans play a vital role in the environment and economic activity worldwide. According to the UN, “Oceans are a highly productive system that continually recycles chemicals, nutrients and water through the hydrological cycle, while driving climate and weather and regulating global temperature by acting as a giant heat reservoir.”. Moreover, oceans form the foundation for a wide variety of industrial, commercial and recreational activities such as fishing, maritime transportation and navigation. Lastly, habitable coastal marine areas are significant: in 2015, 44% of the world’s population lived within 100 kilometers of ocean coasts and about 10% of the world’s population lives in coastal areas less than 10 meters above sea level.

Several issues affect oceans. Different types of pollution reach the oceans from various sources, including wastewater, agricultural runoff, oil spills and non-biodegradable waste. Unsustainable consumption of living marine resources is another serious problem: in 2012, up to 13% of the world’s fisheries collapsed due to commercial overexploitation. Additionally, through dredging for port creation, waste dumps, construction and recreation, coastal areas have been significantly altered and reshaped for human purposes. Scientists have estimated that nearly 10-30% of the world’s coral reefs have been permanently lost, while 70% are threatened with damage attributable simply to direct physical destruction. The burning of fossil fuels increases the ocean’s acidity and harms ecosystems, which induces marine and coral degradation.

The tragedy of the commons has led to a combination of treaties for ocean protection. The main treaties include the United Nations Convention on the Law of the Sea (signed by Chile in 1997), the United Nations Agreement on Fish Stocks (approved for signature in 2015 by Chile), and the Code of Conduct for Responsible Fisheries (a voluntary, non-binding instrument), as well as some anti-pollution measures such as the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matters (also known as the London Convention, awaiting approval for ratification in the Chilean Congress), the Basel Convention (signed by Chile in 1992) and the Global Program of Action, which contains provisions on maritime issues.

In 1999, an excellent initiative was undertaken by the international scientific community called the Global International Waters Assessment (GIWA). Its objective was to comprehensively evaluate the environmental status of oceans, sources of damage and potential future scenarios for their protection. In 2006, the GIWA published its final report, which highlighted the following global problems: freshwater scarcity, pollution, overfishing and other threats to aquatic living resources, habitat modification and global warming.

For the region associated with the Humboldt Current located in the western and central parts of South America (Ecuador, Peru, Bolivia, Argentina and Chile), the GIWA reported that the economy of the region is mainly based on fishing, agriculture, the oil industry, mining and maritime transportation. The activities of these sectors result in two priority environmental and socioeconomic problems in the region: ocean pollution and unsustainable exploitation of fish and other living resources.

A quite different problem occurs with **terrestrial ecosystems**. These tend to be located within a country, but the international community is concerned about protecting them, particularly because some of the world's poorest communities live in areas threatened by the loss of productive capacity due to **desertification**. Desertification refers to the transformation of land into essentially uninhabitable deserts that cannot support human populations. This poses its own problems for a coordinated international strategy.

Desertification is caused by a combination of climate variations and human activities. Virgin drylands suffer during periods of drought but can usually recover on their own. However, when these areas are simultaneously exploited for human economic benefit, the combined stress on the ecosystem becomes excessive. Therefore, excessive cultivation and

grazing, deforestation and poor irrigation by humans play a significant role in the problem of desertification.

The consequences of desertification can be disastrous. Its main effect is the loss of primary resources (fertile land, vegetation and crops) that sustain economic activity. Although the effects of desertification are most alarming in poor regions, resulting loss of productivity is detrimental globally. Kofi Annan, the former Secretary-General of the UN, warned that “desertification (...) affects one-third of the Earth’s surface, endangering 1.2 billion people in more than 100 countries.”.

In recognition of the potentially catastrophic consequences of desertification, the international community created the United Nations Convention to Combat Desertification (UNCCD), which came into force in 1996, was ratified by Chile in 1997 and has currently been ratified by 195 countries.). This is the only binding international agreement that links the environment and development with the sustainable management of soils. The UNCCD addresses desertification worldwide, with a primary focus on Africa, where it is particularly pernicious. In 2007, the UNCCD published a ten-year strategy for desertification reduction, which was in effect from 2008 to 2018, and in 2013, it established goals to end water scarcity through sustainable use of water resources and awareness of drought.

Despite the UNCCD, desertification has not decreased and is even intensifying. Since the problems caused by desertification are limited to individual, mainly low-income countries, virtually no internationally coordinated effort has been made to provide concrete financial assistance. In other words, since affected nations face the problem within their own borders, it seems to be the responsibility of each nation individually rather than the international community as a whole.

The loss of ecosystems (marine and terrestrial) could increase if economic development does not progressively adopt sustainability standards that have a lesser impact on ecosystems and biodiversity. This poses the challenge of concentrating competences on the care of natural resources and biodiversity, as well as generating new and more efficient instruments for conservation.

d) Ozone depletion

Ozone depletion poses complex problems that have led to international disagreements regarding coordinated efforts to reverse the issue. However, unlike global warming, ozone depletion has been successfully controlled through international cooperation and may serve as a model for other global environmental protection efforts.

Ozone forms a layer in the stratosphere (10 to 48 kilometers above the Earth). This layer protects the planet from 95-99% of the harmful ultraviolet rays from the sun. These rays can cause health effects, primarily on the skin and eyes, and disrupt the balance of ecosystems and alter chemical and physical processes that occur in the cycle of nature. Additionally, the thinning of the ozone layer interacts with the trend of global warming.

According to UNEP, since measurements began in the early 1980s, the thinning of the ozone layer over the poles has caused a constant erosion, resulting in “ozone holes” over the Earth. The ozone hole over the South Pole grew to about 2 billion hectares in the early 1990s and, at times, increased to 2.8 billion hectares. In 2001, the ozone layer had thinned by 30% over the North Pole, Europe and other high latitudes. At its maximum size in 2006, the ozone hole in the Antarctic region reached 2.7 billion hectares, while in 2009, the hole reached 2.4 billion hectares, a decrease compared to the previous year and even smaller than the record size in 2006, according to images collected by the National Aeronautics and Space Administration (NASA). By the end of 2012, the area of the ozone hole had reduced to 1.8 billion hectares, the lowest levels observed in over a decade.

The main cause of ozone depletion is the emissions of halocarbons produced by humans, especially chlorofluorocarbons (CFCs). Discovered in the early 20th century, these gases, famous for their industrial properties, were globally used in a wide range of applications, including refrigerators, air conditioning, aerosol cans, solvents and fire extinguishers. The disadvantage of these gases is that they remain in the atmosphere for a long time (50 to 1,700 years) and, thus, cause lasting environmental damage. The chlorine from CFCs chemically reacts with ozone and breaks it down, which reduces the ozone layer’s ability to block ultraviolet rays.

The international response to the ozone threat has perhaps been the most successful of all global environmental efforts. In 1985, the Vienna Convention for the Protection of the Ozone Layer (signed by Chile in 1990) committed countries to promoting cooperation through systematic observations, research and exchange of information on the impact of human activities on the ozone layer, and to adopt legislative measures against activities that would have adverse effects on the ozone layer. At that time, the scientific understanding of ozone depletion was still limited, so no specific measures were established, but countries were willing to acknowledge and combat the problem.

As scientists developed a precise understanding of how ozone depletion occurs, the parties to the Vienna Convention decided to take specific

actions and agreed on the Montreal Protocol on Substances that Deplete the Ozone Layer (signed by Chile in 1990), which established strict guidelines to reduce the use of ozone-depleting substances while allowing room for economic growth in developing countries. This protocol has had four amendments that reflect a better scientific understanding of the ozone issue, without needing to renegotiate the entire agreement but making the agreement flexible yet firm. Currently, out of the 96 chemical substances controlled by the protocol, developed countries have already phased out the use of most of them, while developing countries are still in the primary process of eliminating CFCs. However, substantial progress is expected to be achieved in this decade.

Since its creation, the Multilateral Fund of the Montreal Protocol has financed over 6,000 projects to reduce the use of ozone-depleting substances in 148 developing countries. Obviously, to sustain this work, donor countries must continue to support developing countries in their transition towards ozone-friendly technologies, while developed countries maintain their leadership in permanently eliminating ozone depletion. The partnership between developed and developing countries must remain strong and effective.

The success of the Vienna Convention and the Montreal Protocol can be attributed to developed countries taking the initiative and making the effort credible, and only then asking the less developed countries to do the same. In this sense, countries adopted the “precautionary principle” of acting to protect the environment despite the lack of conclusive scientific evidence and then strengthened and modified their policies based on further scientific research.

UNEP has projected that, without the Montreal Protocol, ozone depletion would have increased up to 70% by the year 2050. Instead, it is expected to decrease in the coming years and gradually return to its normal state by 2050. This success in reversing ozone depletion provides a model for other efforts to combat global environmental issues.

e) Environmental pollution

The relationship between economic development and environmental damage has been evident in the problem of pollution and waste products. The increase in economic activities, especially in industrialized countries, generates pollution from garbage and waste, sewage, greenhouse gas emissions, hazardous pollutants and chemicals.

The Organization for Economic Cooperation and Development (OECD), representing the world’s 36 wealthiest countries, estimates that between

1980 and 2005, the waste produced per person each year among its member countries increased by 35%, and reports that “the generation of municipal waste is increasing at the same rate as GDP in member countries.”. In total, waste generation in OECD countries in 2016 amounted to 570 million tons of garbage per year, accounting for 44% of global generation. At the same time, the United Nations Commission on Sustainable Development declared that the amount of waste generated per person is approximately 1.3 kilograms per day, and by 2025, this amount is expected to exceed 1.5 kilograms per day.

International trade exacerbated this problem in the 1980s. Some environmentally stricter industrialized countries began sending hazardous waste to developing countries to avoid the high cost of disposing of it domestically. Chile was not exempt from these practices. In 1985, over 20,000 tons of toxic waste of Swedish origin were illegally dumped in the city of Arica, and the serious health effects on people and the terrestrial ecosystem are still reported to this day. More than 30 years have passed since this unfortunate event and still no final ruling or solution to this problem has been pronounced. A group of UN experts in June 2021 urged the governments of Chile and Sweden to seek justice and remove the toxic waste dumped in that city, stating that “urgent measures must be taken to safely return the hazardous waste to Sweden for proper disposal.”.

As similar unfair practices were repeated in different countries, the Basel Convention (BC) on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was drafted in 1989 and adopted in response to strong public protests in the 1980s after the discovery of toxic waste dumps in developing countries from abroad. The provisions of the Convention revolve around reducing the generation of hazardous waste and promoting rational environmental management, restricting transboundary movements of hazardous wastes and implementing a regulatory system for permissible movements of hazardous wastes. The BC requires annual reports from each party, provides legal and technical advice and promotes financial assistance to developing countries. The BC entered into force in 1992 and currently it counts 170 parties (including Chile). However, the United States and Haiti have signed but not ratified it.

Similarly, the Stockholm Convention on Persistent Organic Pollutants (POPs) came into effect in 2004. The Convention requires parties to take measures to eliminate or reduce the production of POPs and establishes strict controls on the use, import, export and release of POPs into the environment. These toxic substances, mainly industrial chemical by-products and pesticides, are highly harmful, spread easily and become more concentrated and therefore more dangerous as they move from one

organism to another in the food chain. Most of the POPs regulated by the Convention have already been banned in developed countries under national legislation, so the main objective of the treaty is to provide financial and technical assistance to developing countries.

Currently, 184 countries have ratified the Convention, while the United States has become a signatory without ratifying it.

Why have pollution issues been addressed more easily than global warming or biodiversity loss? Three factors explain the success of international measures against pollution:

1. Many of the scientific uncertainties regarding global warming and biodiversity do not exist for pollution. Those whose economic interests could be harmed by stricter pollution regulations have not been able to successfully argue that the science is uncertain regarding the effects of pollution on humans and ecosystems.
2. There was advanced development in countries regarding the most hazardous chemicals (especially POPs), which had already been banned through national regulations before international efforts. This facilitated the coordination of international strategy.
3. Technology was developed to avoid the use of hazardous chemicals, which made adaptation to pollution regulations relatively cost-effective.

The availability of technologies to control pollution contains two contradictory lessons for the debate on the latest environmental problem in this section: global warming. On the one hand, supporters of strict controls can point to the development of such technology to demonstrate that companies can adapt to be productive and environmentally friendly. On the other hand, those opposed to strict controls may highlight technological adaptation to show that, whatever the environmental problems, the free-market economy can develop solutions without being forced to do so by government regulation. In either case, it seems that a “technological solution” would put an end to environmental problems. However, so far, there are no technological solutions that can end current emissions of pollutants retroactively, and none of them consider the main element of environmental protection, which is the reduction of consumption at all levels and would lead to a reduction in production along with its waste and emissions.

f) Global warming¹⁴

Global warming, also known as climate change, involves the worldwide increase in the Earth's temperature caused by the emission of greenhouse gases (GHGs) released by human activity. This temperature increase leads to a series of environmental problems, such as a rise in sea levels worldwide due to glacier melting, higher levels of precipitation and more frequent severe weather.

According to the Intergovernmental Panel on Climate Change (IPCC) in its sixth report of 2021, GHG emissions from human activities are responsible for about 1.1°C of warming since 1850-1900, and they predict that the global average temperature over the next 20 years will reach or exceed a warming of 1.5°C. According to independent analyses by NASA and the National Oceanic and Atmospheric Administration (NOAA), global surface temperatures in 2019 were the second warmest since modern record-keeping began in 1880. These were surpassed only by those in 2016, which leads to recognizing the past five years as the hottest of the past 140 years.

The cause of global warming is human emissions of GHGs, including the burning of fossil fuels associated with industrial development and energy production, agricultural/livestock activities and other land uses, transportation (land, air and sea) and construction. These activities emit GHGs, such as CO₂, methane, nitrous oxide, chlorine, fluorine and bromide.

To address these problems, in 1992, the United Nations Framework Convention on Climate Change (UNFCCC) established the commitment to “achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.”. The Convention provides a general framework for intergovernmental efforts to address the challenges posed by climate change. Currently, 197 countries have joined the UNFCCC (including Chile in 1994). Subsequently, in 1997, governments agreed to incorporate an addition to the Convention known as the Kyoto Protocol, which had more stringent and legally binding measures.

The Kyoto Protocol, which came into effect in 2005, was a stricter and more detailed procedure for implementing the objectives of the UNFCCC. This protocol committed signatory developed nations to achieving a 5-7% reduction in GHG emissions between 2008 and 2012 with respect to 1990 emissions. Developing nations do not have these specific targets but are

¹⁴ Editor's note: More on Climate Change and Global Health in the corresponding chapter.

incentivized to reduce GHG emissions through voluntary goals and technology transfer, among other methods. However, the commitment period of the Protocol was extended until December 2020.

Both the Kyoto Protocol and its amendments have had countries that have signed but not ratified it, countries that have only signed certain parts of the protocol and others that have withdrawn from it, mainly citing scientific and economic aspects. More importantly, despite being one of the 84 drafters of the protocol in 1997, the United States has been an open critic of the agreement, though being responsible for about one-third of global greenhouse gas (GHG) emissions with only around 5% of the world's population. However, most of the international community has maintained its commitment to moving forward with this protocol and future environmental agreements in the hope that the United States will feel more pressure from its population and others to join.

The United States and other countries, like Australia, expressed several concerns about the Kyoto Protocol, focusing on its scientific basis, economic cost, feasibility and equity, and arguing the following criticisms:

- i) They questioned the seriousness of global warming because the levels of GHG concentration considered as dangerous anthropogenic interference with the climate system or an acceptable concentration of GHGs were not determined. They highlighted that at that time, there was no scientific certainty about what should be understood as non-dangerous levels. Critics of the protocol argue that with this type of uncertainty, the benefits of reducing emissions cannot be properly compared to their disadvantages. Supporters of the protocol, on the other hand, argue that the prospect of better scientific knowledge in the future should not prevent action in the present.
- ii) Reducing GHG emissions would have an economic cost and, as a result, the economy as a whole would face slower growth and job losses and make the cultural division between environmental risk and economic development explicit.
- iii) They considered the prescribed deadlines for emissions reductions unreasonable and unrealistic. For example, CO₂ emissions in the United States increased by 13% in the 1990s, so meeting the goals of the Kyoto Protocol for reducing levels would require a reduction of around 30% by 2010, which they considered highly unfeasible. They proposed that reduction efforts should focus on “GHG intensity” (emissions per unit of Gross Domestic Product) by arguing that this measure considers emissions reduction within the context of economic growth.

iv) They condemned the weaker restrictions of the protocol on developing countries, particularly India and China, compared to developed countries. While the UNFCCC establishes a general mandate for all countries to reduce GHG emissions, the specific commitments of the Kyoto Protocol apply to the group of developed countries based on their better economic position to adopt environmental protection measures.

In response to this last criticism, developing nations argue that it is unfair to burden their current economic development with environmental regulations while developed countries enjoyed unrestricted development in past decades. However, disputes over the balance between economic development and environmental protection, as well as the responsibilities of developed and developing countries, need to be urgently resolved, considering that scientific evidence has become stronger with regard to the causes and consequences of global warming.

These consequences are now seen regularly in the press. Flooding and landslides due to heavy rains in Japan and other countries, heatwaves in the United States, Canada and Europe, droughts in the southern Amazon and the record number of hurricanes and floods in Central America during 2020 are becoming the “new normal” for our planet.

Lastly, the Paris Agreement, the successor to the expired Kyoto Protocol, which began implementation in 2021, aims to keep the global average temperature increase well below 2°C and to pursue efforts to limit the increase to 1.5°C. It recognizes that this would significantly reduce the risks and effects of climate change. The agreement states that this should be achieved by reducing GHG emissions as soon as possible. It also proposes to enhance the ability to implement mitigation, adaptation and resilience measures to climate change and to generate financial flows to achieve emissions reduction and climate change resilience. This Agreement has been signed by 96 countries (including Chile) and the European Union and meets the condition to enter into force as it has been ratified by more than 55 parties which account for over 55% of global GHG emissions.

Although in 2017, President Donald Trump announced the withdrawal of the United States from the Paris Agreement, citing campaign promises in favor of the nation’s economic interests, all other countries around the world reiterated their commitment and communicated that they would not withdraw from the agreement even if the United States did so. Thankfully, the current President of the United States, Joe Biden, has signed executive orders to rejoin the Paris Agreement.

This decade (2020-2030) will be decisive in avoiding a point of no return and maintaining habitable conditions on the planet for present and future

generations. It is imperative to at least meet the goals set by the Paris Agreement. This can be achieved by defining and implementing actions today that aim to achieve carbon neutrality by 2050 at the latest and laying the foundations for building equitable and resilient societies in the face of the impacts and risks caused by this global phenomenon. This is within the context of an era marked by the impact of human activity on the planet due to high levels of consumption, population growth and intensive use of fossil fuels.

Final reflections and challenges for an environmentally healthy and sustainable planet

Globalization has marked the beginning of an era of contrasts, accelerated changes and persistent problems. It has stimulated increasing interdependence between economies and societies through cross-border flows of information, ideas, technologies, goods, services, capital and people. However, this challenges the ability of governments to regulate and control markets and economic activities. The rapid pace of economic developments has led to interconnected global markets and economies, which requires synchronization of national policies on various aspects, with the environment being a crucial consideration. This includes all the resources and elements of nature involved, up to the possibility of transboundary pollution spreading through the land, water and air.

Without effective international governance, globalization can intensify environmental damage, especially where national regulatory structures are inadequate. Competitive pressures threaten to surpass the regulatory capacities of national governments and, thus, requires intergovernmental coordination of national policies in favor of the environment. The response of regulatory institutions to global environmental challenges has generally been below public needs and expectations due to the deeply ingrained weakness of existing institutional architecture. The integrated and interconnected nature of environmental challenges starkly contrasts with the nature of institutions that citizens rely on to find solutions. These institutions tend to be fragmented and poorly coordinated, with limited mandates (and occasionally conflicting interests) and opaque decision-making processes.

Nevertheless, national institutions responsible for environmental protection have important roles to play in both national and global governance. National governments remain the main actors responsible for

regulatory and enforcement powers to address environmental problems. Their responsibilities include functions like setting standards, formulating policies, monitoring compliance and evaluating them. When problems have global dimensions, national governments become key actors again by participating in the information exchange process to reach agreements on global problems to be addressed, necessary policies for their resolution and actions to be taken at national level. Therefore, they need to perform a series of functions at different levels of governance.

The fundamental principles of good governance, such as participation, transparency and accountability, are still under discussion in many institutions with environmental responsibilities. When addressing global-scale environmental problems, especially those arising from the globalization process, institutions must possess several capacities. These include the capacity to identify and define the causes of environmental problems, create awareness about them, draft rules and norms of behavior that lead to the solution of the problems, formulate policy options, facilitate cooperation among governments and other actors, finance and support activities and develop management systems so that national and global environmental policies reflect environmental care and sustainable development.

There is a fundamental principle for a healthier and more sustainable planet: citizen participation. Citizen participation can promote environmental quality by providing a means to organize action and motivate individuals and communities. It allows communities to shape policies and projects to meet their priorities, improve their environment and promote the sustainable use of resources. Participation in planning provides communities with the opportunity to influence decisions about the use of limited resources. Participatory political structures serve as a constraint on the abuse of the environment, as citizens with clear rights and knowledge and access to a legal system that allows for prompt redress can exert powerful restraint on those who violate environmental and health regulations. Local and national institutions responsible for environmental protection could use the process of globalization constructively by assessing local potential, together with communities, and integrating it into territorial development strategies.

In this sense, this chapter cannot be finished without mentioning the “Regional Agreement on Access to Information, Public Participation and Access to Justice in Environmental Matters in Latin America and the Caribbean”: the Escazú Agreement. This pact aims to “guarantee the right of all persons to have access to information in a timely and adequate manner, to participate significantly in decisions that affect their lives and

their environment and to access justice when these rights have been violated”. It establishes the duty to guarantee the participation of communities, in a significant and early manner, in the different instances of environmental decision-making processes. This agreement was signed in 2018 by 22 countries in the region, and even though in 2020, Chile publicly announced its rejection of the agreement, one of the first actions of the new government that took office in 2022 was to sign the message for national adhesion to the Escazú Agreement. Its definitive adoption requires the approval of the National Congress, so it will have to go through both chambers before it becomes law. It is expected that political wills align with this valuable opportunity to position Chile once again as a relevant actor in the environmental issue at international level, so that the agreement is finally signed and the country can move towards greater environmental protection to ensure full and effective implementation of the rights of access to information, public participation and justice for communities.

Finally, an economy based on continuous expansion of material needs and consumerism is environmentally and ecologically unsustainable. Furthermore, it is socially problematic and economically unstable. It is crucial to remember that the environmental consequences described in this chapter are primarily caused by factors that promote overproduction and overexploitation of resources to satisfy consumption needs at national and global level. Future generations will be the ones to suffer the consequences of today’s unsustainable consumption patterns: this disconnection between those who benefit and those who suffer the consequences is deeply unjust, which is why redoubling efforts to lead humanity towards a new trajectory of care and management of natural systems becomes not only an urgent environmental priority but also a moral imperative. This calls for changes in the current paradigm of the dominant economic system. In that sense, economic development must be limited in favor of environmental care and perhaps it is time to start thinking about the development of a new macroeconomics for sustainability: an economic engine that for its stability does not depend on the incessant growth of consumption and the expansion of production. For now, despite some global efforts, progress towards environmental protection and sustainability remains painfully slow and tends to stagnate in the global commitment to economic growth.

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Figure 1. Temporal evolution of the globalization index and economic and environmental indicators for Chile between 1960 and 2018

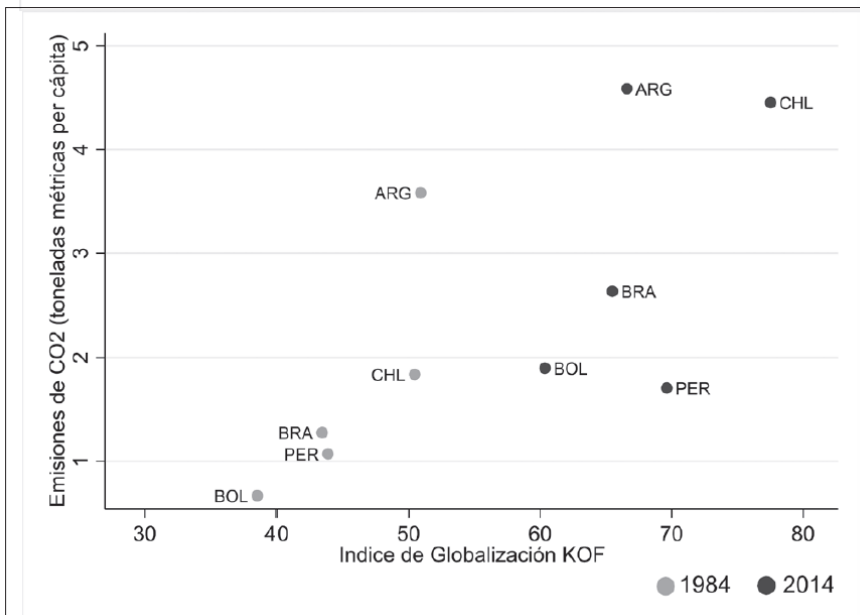
(a)



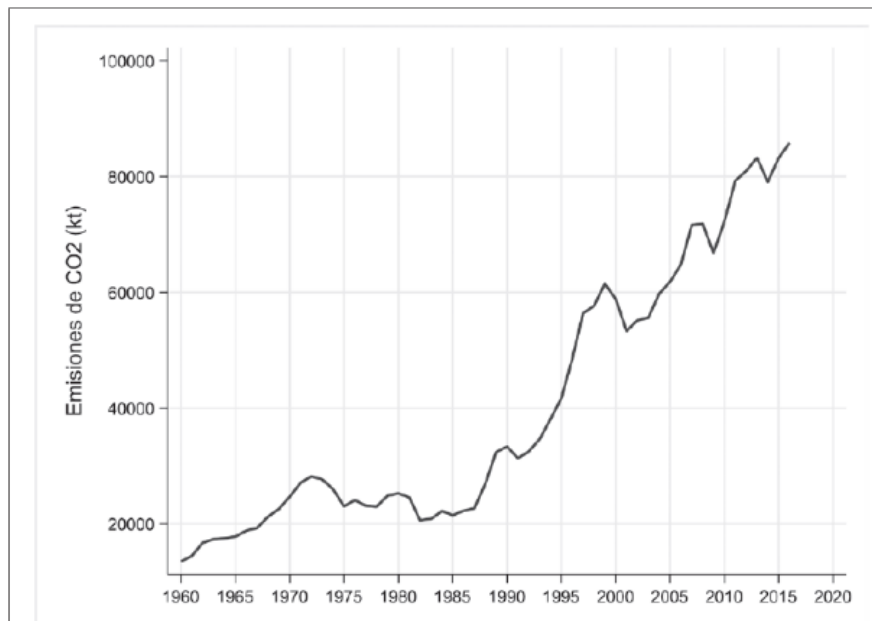
(b)



(c)



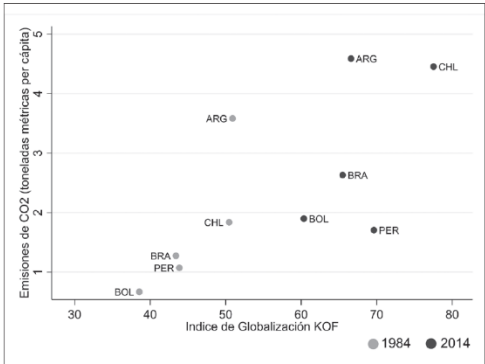
(d)



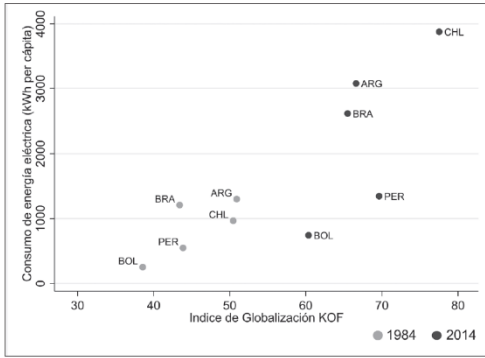
Source: Own elaboration with data from the World Bank and the KOF Globalization Index

Figure 2. Globalization index versus CO₂ emissions, electricity consumption and ecological footprint in five South American countries, for the years 1984 and 2014.

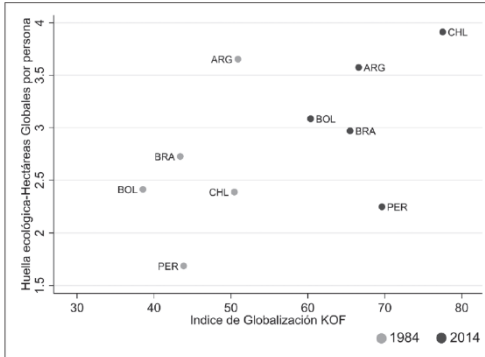
(a)



(b)



(c)



Source: Own elaboration with data from the World Bank and the KOF Globalization Index

6. Biodiversity and its benefits for human health, an indivisible interaction

Alejandra Figueroa Fernández

Biodiversity refers, in simple terms, to the diverse forms of life on the planet, from microorganisms (viruses and bacteria) to large mammals, both terrestrial and aquatic, and including humans. These forms of life are expressed in various environments, under diverse climates and geographical conditions, ranging from the most inhospitable to the most abundant and generous. It is in ecosystems where life and human activities develop.

In general, ecosystems are resilient, but when certain thresholds are exceeded, they become sick. We lose not only biodiversity but also the benefits it provides: water for human consumption, recreation and for species; fertile soils for crop development and forest regeneration and climate regulation, among many benefits. Oceans, rivers, lakes and wetlands provide everything necessary for human activities: industry, tourism, recreation, health and food. When understanding this, we comprehend that the degradation of biodiversity generates poverty, not only for local communities that directly depend on the contributions provided by managed or wild ecosystems, but for all of humanity. Harvesters, shellfish gatherers, artisanal fishermen, mushroom, seed, and herb collectors, farmers, among others, have wisely cultivated what has made human success possible: establishing a home, feeding and reproducing, like any species. Local and global economies depend on these goods and the physical, chemical and biological processes that make them possible. It is especially relevant to understand this in Latin America, where economies directly depend on biodiversity and what it provides.

This article analyzes the concept of biodiversity and its importance, as well as the relationship between society, biodiversity and human health in a context of uncertainties.

The initial moment

The history of planet Earth has been marked by continuous change. It has shaped a unique biological diversity and went from an inhospitable place to being the home of millions of living beings through extinctions and evolution. The exceptional occurs with the appearance of *Homo sapiens* and their spread across the planet. When dealing with the concept of biodiversity, we must also understand that humans are included in this conceptualization. People are an “accident” in the evolution of the planet,

probably like any other species. Ancestors of *Homo sapiens* only appeared in the Holocene, but before that, the planet underwent intense movements since its creation; microorganisms consumed gases and created an atmosphere viable for the rest of life. These microorganisms have diverse forms, such as microbial mats, biofilms, microbialites and stromatolites, which differ in their chemical composition and molecular structures (Rasuk et al., 2016). What they have in common is that they represent the oldest life records on Earth, about 3.5 billion years (Pérez et al., 2020, Rasuk et al., 2016). In Chile and Argentina, these microbial formations have been recorded in relic lagoons of Andean lakes, small saline lagoons of salt flats in the South American Puna (Chile and Argentina) (Demergasso et al., 2004, Fariás et al., 2014; Pérez et al., 2020). They are also found in other parts of the planet like Mexico, Australia and the United States.

Then the development of more complex life forms begins, including eukaryotes, multicellular organisms that require oxygen and food. This marks the dominance of these multicellular organisms, which create the large mammals and plants of the Jurassic and Cretaceous periods. Everything that has existed, exists and will exist on the planet is the result of a complex interaction between physical, chemical and biological processes. Up until this point, our ancestors managed quite well without *Homo sapiens*.

As Darwin said, it is evident that over millions of years, the fittest individuals have persisted or evolved, those who can best adapt to changing conditions. Darwin's theory opened new areas of knowledge in biological sciences and explained a well-kept secret. In his work "On the Origin of Species" (1859-1872), Darwin developed ideas to explain how species have modified and acquired different "forms and structures", including the causes of variation between species and the variability within a species. Darwin references and reconstructs the relationship between geographical areas, glacial periods, the importance of seed dispersal and the unique characteristics of species that only inhabit oceanic islands.

Silently, species activate their biological processes, a perfect machinery that adapts or dies with new local and global scenarios: volcanic eruptions, glaciations and meteorite impacts on Earth's surface. There have been five major extinctions on the planet, with the most recent being the dinosaurs 65 million years ago (end of the Cretaceous period). According to some experts, we may be facing a sixth mass extinction of species. However, the cause driving this latest extinction has one single responsible party: humanity, which we will discuss further. We return to Darwin, who, to support his theory on species variability, argued that:

"Variability is not actually caused by man; he only exposes (...) and then nature acts upon the organization and produces a variation. But

man can and does select the variations given to him by nature and accumulate them in any desired manner.” (Darwin, 2010, p. 626).

With that said, the biodiversity of the planet has been dominated by humans, utilized and exploited to the limit, with nothing to stop us. Humans have demonstrated the ability to dominate other species and intervene in what is useful to us. However, at the same time, we have established a material relationship with nature that directly affects us, expressed through a global climate crisis. Socially, it leads to increasing socio-environmental conflicts, and economically, it exacerbates inequalities that have deepened through the systematic exploitation of biodiversity. These problems are particularly acute in Latin America (Gligo et al., 2020).

Biodiversity and its contributions

As mentioned, biodiversity encompasses the diversity of all organisms, including plants, animals and microorganisms, as well as the diversity within a species, between species and among different populations, and even the diversity of ecosystems and landscapes (MA, 2003). In 1992, the Convention on Biological Diversity agreed upon the following definition of biodiversity: “It is the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (CBD 1992). Each of these levels (ecosystems, species and genes) is characterized by composition and function. For example, in ecosystem diversity, composition refers to habitats and one of the functions is nitrogen fixation. Among the contributions provided by biodiversity, defined by literature as ecosystem services, the following are recognized: carbon capture and storage, food generation, purification of pollutants, availability of oxygen and participation in biogeochemical processes. At the ecosystem level, these attributes range from reducing flood impacts in river basins to infiltrating water into aquifers and releasing it during droughts, as well as contributing to the control of the water cycle and other gases. All these processes are carried out in an organized manner by soil, water and air microorganisms, animal and plant species, as well as fungi and bacteria that inhabit all environmental matrices, including soil, water (marine and continental) and air. In turn, the ocean contributes to planetary regulation by providing 50% of the available oxygen (Paulmier, 2017) through the capture and sequestration of atmospheric CO₂, and the redistribution of heat on the planet (IPCC, 2019). In marine ecosystems, photosynthetic and metabolic processes take place, which are crucial for the availability of carbon and oxygen for the planet.

Latin America holds 20% of the global biodiversity and 10% of the world's freshwater reserves (IUCN, 2015). In the Andean systems of Latin America like salt flats, Andean lagoons and wetlands, extreme environments house wild species that existed long before humans and have high endemism (fish, plants). This means that they have a very restricted distribution and are unique. If they disappear from their habitat, they vanish completely and become extinct. Furthermore, the coasts of Latin America are home to estuaries, mangroves, marshes and fjords that receive nutrients from rivers and, thus, foster coastal productivity and support artisanal fishing. Mangroves play a vital role in carbon sequestration and coastal protection, along with peat wetlands, which are ecosystems that retain large amounts of water and are more efficient carbon storers than terrestrial forests. They are limited to a few spots in the Southern Hemisphere, some Andean tropical areas, and occupy only 5% of the total global surface area (Lappalainen, 1996). They serve as a lifeline in climate change.

Biodiversity also provides cultural services, which are social contributions often undervalued because they are not exchangeable or monetizable goods. However, they are of vital importance for social relationships and other aspects of human well-being, like the contemplation of aesthetic beauty, recreation and spiritual well-being, all of which contribute to overall well-being and mental health (Marselle, 2019).

However, biological and biogeochemical processes are limited and disrupted when ecosystem health is lost. The contributions provided by biodiversity are declining due to intensive and persistent human modifications and disturbances to natural systems. We are losing habitats, species and the quality of soils, rivers, lakes and wetlands. The health of ecosystems is crucial for a safe planetary condition, as indicated by various reports from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2016, 2018, 2019). However, as early as 2003, the Millennium Ecosystem Assessment (MA) presented alarming results. It was the first global report to assess ecosystem health on the planet (MA, 2003) and it included a special report on wetland ecosystems and human well-being (MA, 2005). These reports already warned about the loss of ecosystems due to urban expansion, changes in land use, eutrophication, pollution, overexploitation of wild and domesticated species for industrial use and human consumption, introduction of invasive exotic species and increased water extraction.

Fifteen years after the evidence presented by the MA (2005), each area of intervention has worsened, and biodiversity degradation and loss have increased. 75% of the global land surface has been transformed and 85% of wetlands have been lost. Despite these alarming figures, we can reverse the current situation.

Climate change, the limits of the biosphere and risk

The magnitude of the changes on the planet in the last 100 years has been marked by climate change, with increasing temperatures, and has defined a new era known as the Anthropocene, which corresponds to “the temporal interval in which many geological processes are profoundly altered by human activities” (Moreno et al., 2018, p. 16). There is consensus among scientists that the environmental changes the planet has experienced in the last century are unprecedented.

The thresholds to sustain life as we currently know it are out of control (Rockström et al., 2009). In 2018, global alarms were raised, triggered by the communication from the Intergovernmental Panel on Climate Change (IPCC): the temperature of the planet cannot increase by 1.5°C (IPCC, 2018a). The effects of global warming had been reported for decades by the IPCC, with irrefutable evidence such as increased tides, accelerated ice loss in the poles, glacier melting and changes in hydrometeorological events. However, it was not until 2018 that the direct link between biodiversity loss and climate change was strongly emphasized. The gravity of these events is expressed not only by the loss of ecosystems and species but also by the risk to humanity and its inhabited spaces. Land use change is the greatest threat to biodiversity, mostly driven by agriculture. Its expansion affects native terrestrial ecosystems as well as continental and coastal water ecosystems (Foley et al., 2005; Newbold, 2018).

There is consensus among scientists that the interaction of direct and indirect “drivers of change” influences nature and our impact on it. The “direct drivers” of change on nature that affect all types of ecosystems include climate change, pollution, deforestation, and invasive exotic species. The indirect drivers correspond to the underlying causes of environmental change, such as public policies with perverse incentives, governance systems or the lack thereof, societal constructed threats, and economic inequalities, among others. All of these drivers can act independently or synergistically (IPBES, 2019).

Climate change has been identified as the factor with the greatest impact on biodiversity in the coming decades. Along with increasing temperatures and changes in precipitation, chemical and biological phenomena occur synergistically and create unstable and adverse conditions for species and ecosystems. This leads to changes in migratory patterns and the composition of biological communities (Arneth et al., 2020) as well as the structure and functioning of various terrestrial and aquatic ecosystems (Walther et al., 2002; Brooker et al., 2007, cited by Koleff et al., 2019). Furthermore, climate models have been improved with more and

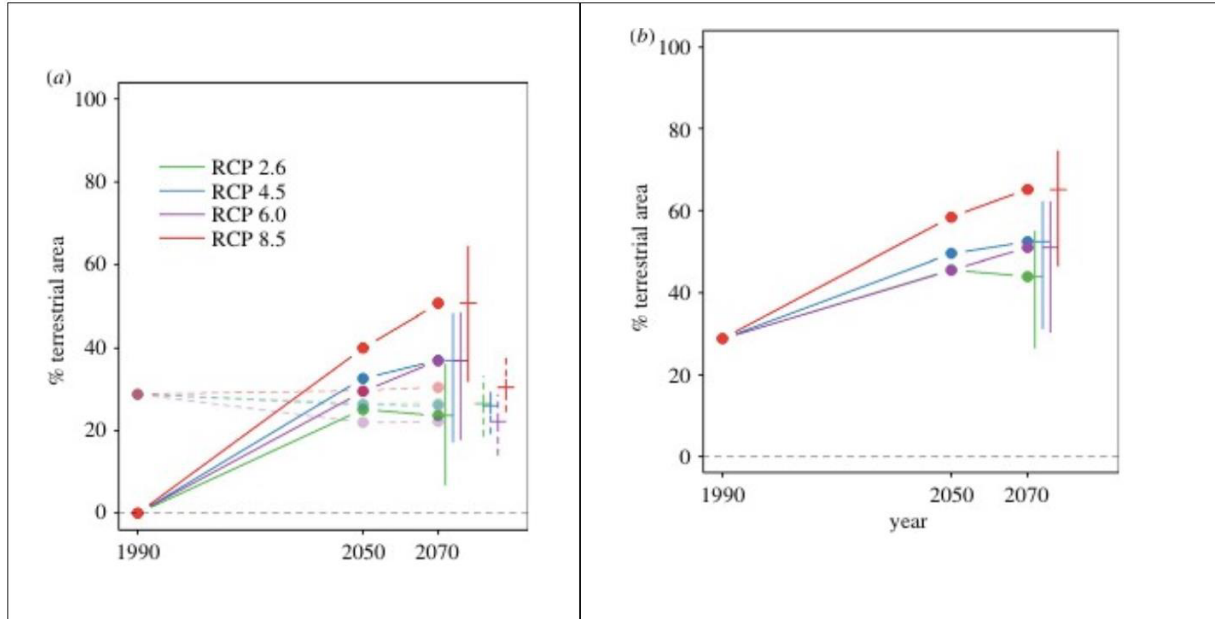
better data, demonstrating human influence on the oceans, cryosphere and biosphere (Eyring et al., 2021).

The cumulative effects of these changes result in discouraging figures: 1 million species are severely threatened or face extinction, which accounts for 25% of the studied groups, including vertebrates, invertebrates and terrestrial plants from continental and marine aquatic ecosystems (IPBES, 2019). The loss of wetlands has been three times faster than that of terrestrial forests, to the extent that by 2000, only 13% of the surface area that existed in 1700 remained (IPBES, 2019). In addition to climate change, the causes of loss include the overexploitation of forests and fisheries, invasive species and increased contamination of water, air and soil (Pauly et al., 2005; Farjalla et al., 2018; Koleff et al., 2019).

Furthermore, ocean acidification and coral loss are unprecedented processes (IPCC, 2019). In Chile, the reductions in water flows are not only explained by the megadrought affecting the country, particularly the central zone (Garreaud et al., 2017), but also by increased water extraction and anthropogenic alterations in basins, coastal areas and urban environments (Pauchard & Barbosa, 2013; Habit et al., 2019; Aguayo et al., 2021).

According to Koleff et al. (2019), the unique characteristics of each region in terms of ecological processes and biodiversity are sometimes overlooked, as their responses vary across different regions of the world, determined by specific evolutionary processes. Figure 1 represents the percentage of loss of terrestrial surface area, which would result in the loss of more than 20% of vertebrate species. This exercise was carried out under four global climate scenarios (RCP 8.5; RCP 6.0; RCP 4.5; RCP 2.6), which estimate climate and land-use changes (conservative models). All these scenarios are based on different socio-economic assumptions according to the author, with or without mitigation for greenhouse gas emissions. The least optimistic scenario is RCP 8.5.

Figure 1. Predicted percentage of land area that exceeds 20% species loss under future climate change and land use scenarios.



Note: All values are expressed relative to a baseline prior to human activity. The separate effects of climate (solid, opaque lines) and land use (dashed, translucent lines) are shown in (a), while the combined effects of both pressures (assuming no interactions) are shown in (b). The error bars indicate the estimated uncertainty in the projections for the year 2070: 95% confidence intervals for land use impact models, and the range of estimates in the ensemble of distribution models for climate impact models. The results of land use and climate impacts are based on final projections with a spatial resolution of 0.5°C. Taken from Newbold T. (2018). Published by the Royal Society under the terms of the Creative Commons Attribution License <http://creativecommons.org/licenses/by/4.0/>, which permits unrestricted use, provided the original author and source are credited.

At regional level, for terrestrial ecosystems, a study conducted by several authors, within the framework of the evaluation of the IUCN Red List of Ecosystems, found that 85% of forested areas in the Americas are “potentially threatened” (Ferrer et al., 2018, cited by Lehm et al., 2019, p. 31), especially in South America, under the categories of “critically endangered”, “endangered” and “vulnerable”. Pliscoff (2015), in turn, conducted the same assessment of ecosystems for Chile (based on the classification of ecosystems according to the IUCN) and the results show that the ecosystems of the Mediterranean ecoregion (central zone of Chile) are in a critical condition and at risk of collapse. The causes, according to the authors, are the change in ecosystem cover.

We have exceeded the limits of acceptable states for living; the

biosphere has been altered and the consequences are known. The “planetary boundaries”, defined by Rockström et al. (2009), are processes in which life can still be possible and, based on the available global level information, thresholds were proposed for seven of the nine identified processes: climate change, influence on the stratospheric ozone layer, ocean acidification, influence on nitrogen and phosphorus cycles, loss of biodiversity, land use change and freshwater use. A review in 2015 determined that four of these boundaries had already been exceeded: climate change, loss of biosphere integrity, land use change and alteration of biogeochemical cycles (phosphorus and nitrogen). All of these have direct implications for human health, as we will see in subsequent chapters.

“Determining a safe distance involves normative judgments about how societies choose to deal with risk and uncertainty” (Rockström 2009, p.5) and an element of necessary analysis to address these problems is that communities or social groups use and perceive nature in diverse ways and perceive risks differently, primarily influenced by cultural aspects (Finucane et al., 2014). Are the ways of analyzing territorial problems adequate? What information do we have to make decisions? If, on the other hand, the risks of exceeding the limits of nature are discussed based on well-being, designing good practices, innovation and technology together, people are likely to be more willing to trigger changes, amplify successful experiences (Koleff et al., 2019) and consider possible solutions (Foley et al., 2005; Rockström, 2009; Kok et al., 2018).

The history of human use and abuse of ecosystems tells the story of adaptation to the changing conditions that we create.
(Folke et al., 2005. P. 442)

Biodiversity conservation or biological diversity (CBD, 1992) has not been seen as a structural pillar for the secure availability of natural resources and continues to collide with economic growth. The management of natural resources and biodiversity conservation are parallel paths in the design of public policies and the hyper-globalized economy. Market rules have established a way of using territory that, along with generating wealth, has reinforced inequalities. This has worn down the State and governments. Distrust in State organisms in Latin America is growing (Gligo et al., 2020), but the policies and conditions that prevent progress remain. Human activities have transformed nature relentlessly and dangerously for our survival, as evidenced in various international reports (Alkemade et al., 2009; Vinicius et al., 2018; Eyring et al., 2021). Absolutely all activities carried out by society depend on nature; every reality in the Universe is “interconnected and self-organized” (Vila et al., 2006, p. 13). The meaning of this is filled with complexities, according to Castree et al. (2009), that we have not been able to fully comprehend to achieve sustainable use. All modified systems where agriculture, livestock and fishing take place also

constitute or are part of biodiversity (Sarukhán et al., 2009).

We are not only ending the lives of several species, but we are also making many areas of our planet uninhabitable. Pesticides are used to protect crops from pests, agrochemicals are used to replenish lost nutrients due to intensive soil use, but this reduces the diversity of species necessary for biological and productive balances.

The use of fertilizers by the agricultural industry has increased to the point that in 2007, developing countries used 160 million tons compared to 40 million tons in developed countries (Marquet et al., 2018). Lakes, rivers and coastal areas reported on between 2008 and 2010 shows high levels of fecal coliforms (serious concentration that exceeds thresholds) in practically the entire coastal area of Latin America and the Caribbean (UNEP 2016, cited by Ramsar 2018). The introduction of livestock and forest plantations and the replacement of native forests have had devastating effects on global biodiversity, particularly in Latin America (Vinicius et al., 2018; González-Andújar et al., 2018), as well as on water availability, according to studies carried out in Chile (Lara et al., 2009; Little et al., 2010; Alvarez-Garreton et al., 2019; Marquet et al., 2018).

Consequently, the ecological integrity of rivers and wetlands is being altered, and everything that happens in their surroundings affects them. Alterations in these systems have synergistic causes and patterns, and global scientific research has shown the risks to our subsistence (Ramsar 2018). Aquatic ecosystems tolerate some stress conditions with certain thresholds of tolerance, but when exceeded, they cease to be resilient and change their configuration in terms of structure and function, and can become a social and health problem.

Appealing to the theoretical framework of social metabolism (Fischer-Kowalski 1998; Toledo 2013), it can be argued that as society increases its needs, it relies on these systems to meet them, without considering their complexity. The social and global metabolic process is similar to processes at cellular and organism level. However, it seems that society as a whole produces, discards and consumes beyond the limits it can bear and far beyond the limits that the biosphere can sustain. Thus, the social metabolism, with its various levels, leaves its mark by taking what it requires (a first level of “appropriation”; Toledo et al., 2013, p. 47) and discarding what it does not need (from industrial to organic waste). In this process, we accumulate material goods such as houses, industries and roads, or expand agricultural land, but our development capacity is reduced. This leads to an environmental and social crisis, and, as Toledo (2013) states, we have a problem created by society “with new dynamics and unpredictable synergies” (Toledo 2013, p. 41) and “planetary boundaries” (Rockström et al., 2009; Steffen et al., 2015) that leave many people out of

a space of choice and just a few with a very wide margin of decision-making.

But changes in land use also have social occupation of spaces and urbanization as factors of change, and although the latter have occurred unevenly globally, their levels of impact are increasing (Rojas et al., 2019). Three-quarters of the population in Latin America live in precarious neighborhoods, concentrated only in three countries: Brazil, Mexico and Peru (Sandoval and Sarmiento, 2018). This is not just a problem associated with the type of housing or socio-economic precarity; we are facing multidimensional poverty, in which the environmental, social and economic environments are also involved. The social fabric is at risk, and the ecological fabric has been transformed and inhabited without any planning. In this sense, ecosystems are no longer seen as a contribution. Urban expansion in LAC goes hand in hand with exposure to danger. Likewise, political and social factors are influencing the vulnerability of the population, which compels, allows or defines the occupation of areas classified as at risk of mass removal, floods and landslides, among others. This reduces resilience and adaptation to climate change, with negative consequences for biodiversity and the most vulnerable (Swyngedouw & Kaika, 2014). We are clearly facing a lack of governability and governance that has become normalized inequality.

We aspire to have clean air, clean water for human consumption, healthy food, recreational spaces and other basic needs. All the above areas are related to proper use of biodiversity and rational land use, with collective and individual responsibility. The concept developed by Elinor Ostrom referring to the “tragedy of the commons” (Ostrom 2000, p. 28) is still relevant. We have neglected governance of the main actor: nature.

Latin America and the Caribbean have essential attributes to change the current scenario of social, environmental and economic inequality, as well as to address the environmental and social challenges that stem from unsustainable land use. However, we must address the underlying factors that maintain this situation, so treating problems in an integrated manner is more effective. Thus, social and economic issues should be part of an environmental agenda.

Biodiversity and human health

“A biodiverse natural environment is a resource that promotes health”
(Cook et al., 2019, p. 251)

The social relationship with biodiversity occurs in different ways, depending on cultures, knowledge and personal or inherited experiences. The interaction between nature and society has been described as a socio-

ecological system (Folke et al., 2005) and all levels of biodiversity play a fundamental role in covering all areas of human well-being. Human health is essentially an expression of that well-being, which we will briefly review.

One of nature's material contributions to society is the diversity of natural components for the development of medicines, which have been synthesized from natural products to provide relief for millions of people in case of diseases, such as medications to control cancer, penicillin, corticosteroids or aspirin. All these medicines have their origins in plants or fungi. Botany and chemistry have come together to improve people's well-being.

But food also depends on a series of interconnected natural processes: the diversity of plants, fungi, pollinators, soil quality and water, among others. However, trapped in long-standing public and economic policies, these biological processes have been destabilized and affect human health. A global report released in 2016 details the severity of the impacts on pollination, pollinators and agriculture from pesticides such as neonicotinoids. The estimated global economic loss of crop production due to the declining population of pollinators ranges from USD 235 billion to USD 577 billion. This double impact affects both ecosystem health and human health. Research on the effects of these compounds on human health has been reported for decades and has led to pesticide bans in several European countries. However, decisions in Latin America and other parts of the world are slow and disregard scientific evidence.

Another aspect that highlights the relationship between biodiversity and human health is vector-borne diseases that are transmitted from their natural habitats to others that have been disrupted by human activities. The release of viruses, bacteria and other microorganisms from wildlife to domestic animals and eventually to humans creates emerging diseases known as zoonotic diseases. These diseases require increased efforts from science and public health to address them. Each year, zoonotic diseases cause 700,000 deaths, which constitute 17% of all global infectious diseases. Examples of zoonotic diseases include dengue, Chagas disease and malaria (WHO 2017).

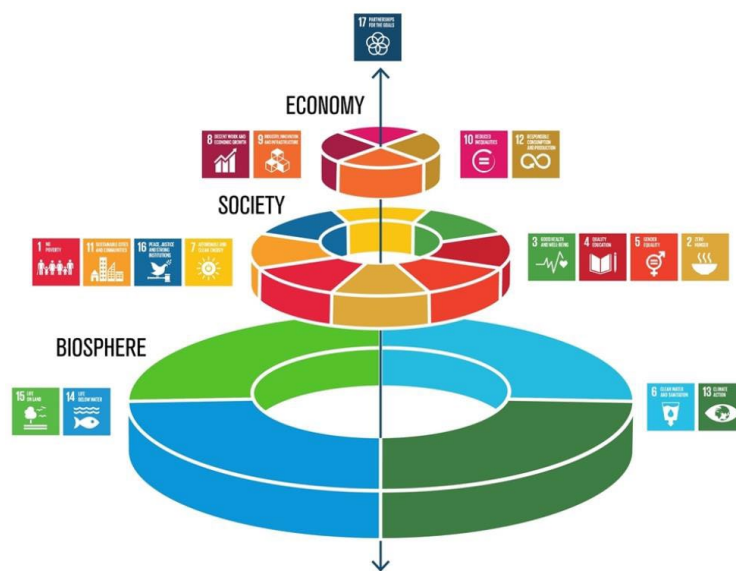
A recent example of the impact of disrupting nature on human health is Covid-19, a virus that caused a catastrophic pandemic. Viruses are biological entities that lack the molecular structure of life, DNA. Their reproduction and success depend on a host organism that uses its machinery to replicate, spread and perpetuate. The diversity of viruses on Earth is estimated to be 1×10^{31} . Although viruses are often associated with causing diseases, some of them play vital roles in their interactions with other organisms, including humans.

The success of Covid-19's global spread cannot be attributed solely to its ability to find a host. There is ample scientific evidence, globally and in Latin America, that highlights the consequences of surpassing nature's limits. Climate change, biodiversity loss and Covid-19 are all interconnected, which highlights the consequences of our unsustainable production and economic systems.

A socio-ecological system with low levels of memory and social capital is vulnerable to changes and can deteriorate to undesired states, as we are witnessing with the climate and biodiversity crises. It is crucial to address risk prevention and build local capacities for climate change, biodiversity and disease in an integrated manner. The relationship between biodiversity and people's quality of life is inseparable and affects the entire human population regardless of gender, geographical location and economic or cultural level.

In 2016, Johan Rockström and Pavan Sukhdev, researchers from the Stockholm Resilience Centre, proposed a shift in the understanding of the Sustainable Development Goals (SDGs) by considering the biological framework. They emphasized that the biosphere provides the fundamental elements for human well-being and economies. Their proposal suggests an integrated approach to the SDGs by recognizing their interconnectedness with well-being, food security and human health. Therefore, taking decisive action to mitigate climate change (SDG 13), restore marine ecosystems (SDG 14), restore terrestrial ecosystems (SDG 15) and ensure access to clean water (SDG 6) are fundamental objectives for society and the economy.

Figure 2: Proposal to understand the interrelation of the SDGs within the biosphere.



Source: <https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html>. Credit: Azote Images for Stockholm Resilience Centre, Stockholm University.

Human and planetary health depends on a diverse and contextually relevant living space, with opportunities for prudent and sustainable use. Alongside this, we cannot overlook public health in this analysis, which, according to Acheson (1988), is “the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society” (quoted by Cook et al., 2019, p. 252). These direct and indirect factors that cause diseases should be dealt with in a collaborative effort between natural sciences and public health. Acheson (1988) and Marmot (2010) identified as elements of interest in public health those actions that involve reversing the differences in poor health between people with more or fewer opportunities. Therefore, we need social well-being with environmental equity.

Various groups of researchers, organizations and communities are testing a different and environment-friendly way to make this possible in urban and rural sectors (Saavedra et al., 2019; Rojas et al., 2019; Kabish, 2019; Figueroa et al., unpublished), with solutions alongside communities to improve and fully implement public policies.

The current global condition calls for transformation in all areas, at a scale and speed greater than ever before. The ongoing Covid-19 pandemic has demonstrated human fragility and revealed the challenges in health and the environment. Economic systems are mobilizing once again, and initiatives for economic recovery are emerging rapidly. However, not all of them address the urgency of this second phase in the Anthropocene era, which is to conserve biodiversity and halt its loss based on science and knowledge, to restore ecological and social fabric, reduce associated risks and enhance resilience to climate change and global challenges.

Glossary

Anthropocene: The Age of Humanity, a proposed new name for the current geological epoch, defined by our massive influence on the Earth’s climates and ecosystems. The concept was coined in 2000 by Nobel laureate Paul Crutzen.

Biodiversity: The variability of living organisms from all sources, including, among other things, terrestrial and marine ecosystems and other aquatic ecosystems and the ecological complexes of which they are a part. It includes diversity within species, between species and of ecosystems (Article 2 of the Convention on Biological Diversity).

Biosphere: The sphere of air, water and land in which all life on the planet

exists; the global ecological system comprising all living organisms and their relationships.

Climate change: Variation in the state of the climate that can be identified (e.g., through Statistical tests) by changes in the mean or variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to internal natural processes or external forcings, such as modulations of solar cycles, volcanic eruptions or persistent anthropogenic changes in the composition of the atmosphere or land use. The United Nations Framework Convention on Climate Change, in its Article 1, defines the phenomenon as “a change of climate that is attributed directly or indirectly to human activity and alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods”. The UNFCCC, therefore, distinguishes between climate change attributable to human activities that alter atmospheric composition and climate variability attributable to natural causes (IPCC, 2018b).

Natural capital: An extension of the traditional economic concept of “capital”, coined to represent the natural resources that economists, governments and companies tend to exclude from their balance sheets. It can be divided into non-renewable resources (e.g., fossil fuels), renewable resources (e.g., fish) and services (e.g., pollination).

Ecosystem: A dynamic complex of plant, animal and microorganism communities and their non-living environment that interact as a functional unit (Article 2 of the Convention on Biological Diversity).

Resilience: The capacity of a system to cope with change and continue to develop or return to its original state (Holling, 1973).

Ecosystem services: The benefits that people receive from ecosystems (WHO, 2005).

Socio-ecological systems: Linked systems of people and nature. The term emphasizes that humans must be seen as part, not apart, from nature and that the separation between social and ecological systems is artificial and arbitrary.

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7. Climate Change and Health

Ignacio Silva Santa Cruz, Yasna K. Palmeiro-Silva

Introduction

In recent years, multiple extreme weather and climate events caused by climate change have been observed around the world. Heavy rains in Europe have led to unprecedented flooding in Germany and Belgium, where authorities declared it “the greatest disaster since World War II” due to the impacts on infrastructure, missing persons and fatalities (BBC, 2021b). Torrential rains in China have caused devastating floods and the relocation of thousands of people from disaster areas to safer zones (BBC, 2021a). Additionally, the West Coast of Canada and the United States experienced one of the worst heatwaves in history, with temperatures reaching nearly 50°C in June (BBC, 2021c), similar to what happened in Africa, Asia and Europe in July 2022 (NASA, 2022). In Turkey and Greece, hundreds of wildfires have been recorded, which has led to the evacuation of thousands of people and devastating consequences for biodiversity (The Guardian, 2021). All these events and many others, have impacted the well-being and health of millions of people and caused hundreds of deaths. This highlights the close relationship between climate change and the well-being and health of the population.

The above events have not occurred by chance but rather because the climate system has been changing over time. According to scientific evidence and the latest report from the Intergovernmental Panel on Climate Change (IPCC), it is highly likely that this climate change is attributable to human activities and the use of fossil fuels in energy generation, farming practices, deforestation, transportation systems and industrial processes (IPCC, 2022).

Currently, humanity is at a critical point regarding climate action. Scientific evidence shows that, given the levels of greenhouse gas emissions, atmospheric temperatures will continue to rise and extreme weather events will continue to occur in all regions of the world. However, these effects could be mitigated if countries rapidly and urgently reduced greenhouse gas emissions (IPCC, 2022). This would not only benefit the climate system but also the economy and society and have positive impacts on the well-being and health of people.

To understand the relationship between climate change and population health, this document first provides a brief introduction to the

climate system to understand its basic concepts. It then analyzes the relationship between anthropogenic climate change and population health, as well as the main actions taken at the international, regional and national levels. It concludes with some climate action strategies and the role of different actors in society.

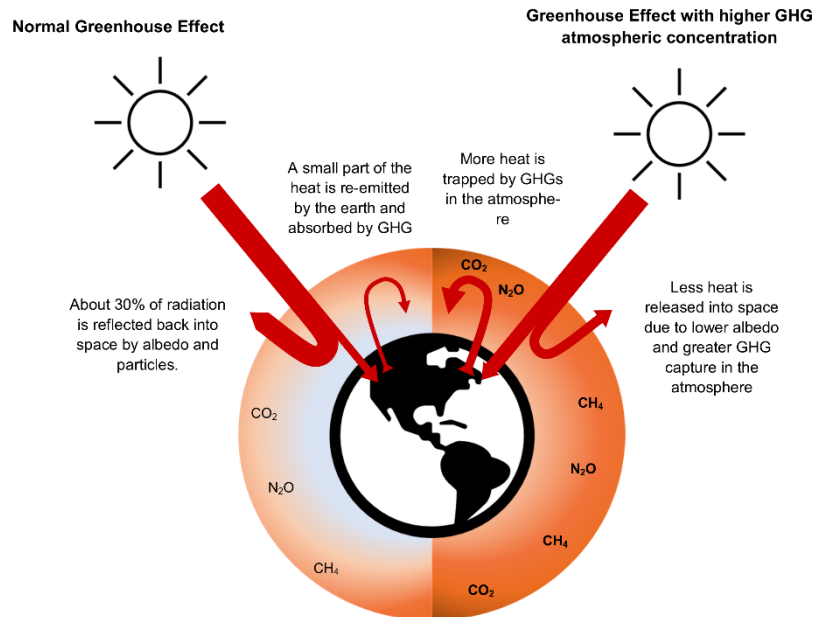
Climate System and Climate Change: Basic Concepts

To understand the relationship between climate change and population health, it is necessary to know some basic concepts related to the climate system. Life on Earth is possible due to complex interactions between the components of the climate system: the atmosphere, hydrosphere, cryosphere, lithosphere and biosphere. Briefly, the hydrosphere comprises all water bodies on Earth, including oceans, fresh water in rivers and lakes, groundwater and water in the atmosphere. The cryosphere is limited to the portion of solid or frozen water. The lithosphere refers to the solid layers of the Earth. The biosphere encompasses all living organisms in the atmosphere, soil and oceans.

Finally, the atmosphere contains different gases, with the most abundant being Nitrogen (N), Oxygen (O), Argon (Ar) and Carbon Dioxide (CO₂). These gases include the greenhouse gases (GHGs), which trap heat and are responsible for maintaining a habitable planet at an average global temperature of 15°C.

The greenhouse effect occurs when the Sun emits solar radiation that reaches the atmosphere and heats the Earth. Approximately two-thirds of this radiation is reflected back into space, but the remaining third passes through the atmosphere, where some of it is absorbed by water vapor and other GHGs, and the rest by the Earth's surface. This absorbed energy heats the Earth, but some of this energy is re-emitted from the Earth into the atmosphere as heat, where GHGs trap it to keep the atmosphere warm (Figure 1, left diagram).

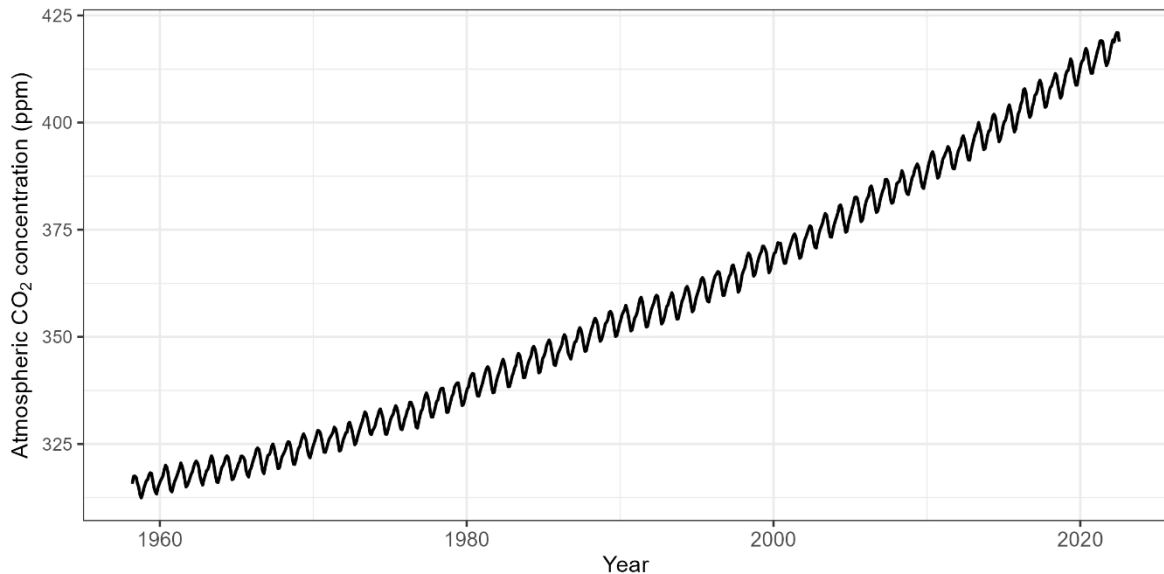
Figure 1. Diagram of the normal greenhouse effect (left) and the greenhouse effect with a higher concentration of GHGs in the atmosphere (right).



Source: Own elaboration.

For several decades, the concentration of greenhouse gases (GHGs) in the atmosphere has been increasing due to excessive use of fossil fuels, widespread agricultural practices and deforestation of forests that serve as CO₂ sinks . To accurately measure the concentration of certain gases, Charles Keeling began measuring atmospheric CO₂ concentration at the Mauna Loa Observatory in Hawaii in 1958, which showed a sustained increase over time (Figure 2) (Tans & Keeling, 2022). From 1750 to 2019, CO₂ has increased by approximately 47%, methane (CH₄) by 156%, and nitrous oxide (N₂O) by 23% (IPCC, 2022).

Figure 2. Keeling Curve of atmospheric CO₂ concentration measured at the Mauna Loa Observatory as of July 11th, 2022.



Source: Own elaboration. Data source (Tans & Keeling, 2022).

As a result of the increase in atmospheric GHG concentration, more heat is trapped in the atmosphere, which leads to an increase in atmospheric temperature and global warming (Figure 1, right diagram). This phenomenon, known as global warming has been defined as “an estimated increase over a 30-year average of the Earth’s surface temperature relative to pre-industrial levels, unless otherwise specified” (IPCC, 2022). According to IPCC data, from 1850-1900 to 2010-2019, the increase in global temperature caused by human activities has been 1.07°C (IPCC, 2022).

The increase in temperature in the atmosphere has caused alterations in the climate system, which results in changes in rainfall patterns, melting ice, rising sea levels, droughts and other effects. These changes in the climate system are known as climate change, which has also been defined by the IPCC as “a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties and that persists for an extended period, typically decades or longer” (IPCC, 2022). Furthermore, this alteration can be caused by “natural internal processes or external forcings, such as solar cycle modulations, volcanic eruptions and persistent anthropogenic changes in atmospheric composition or land use” (IPCC, 2022).

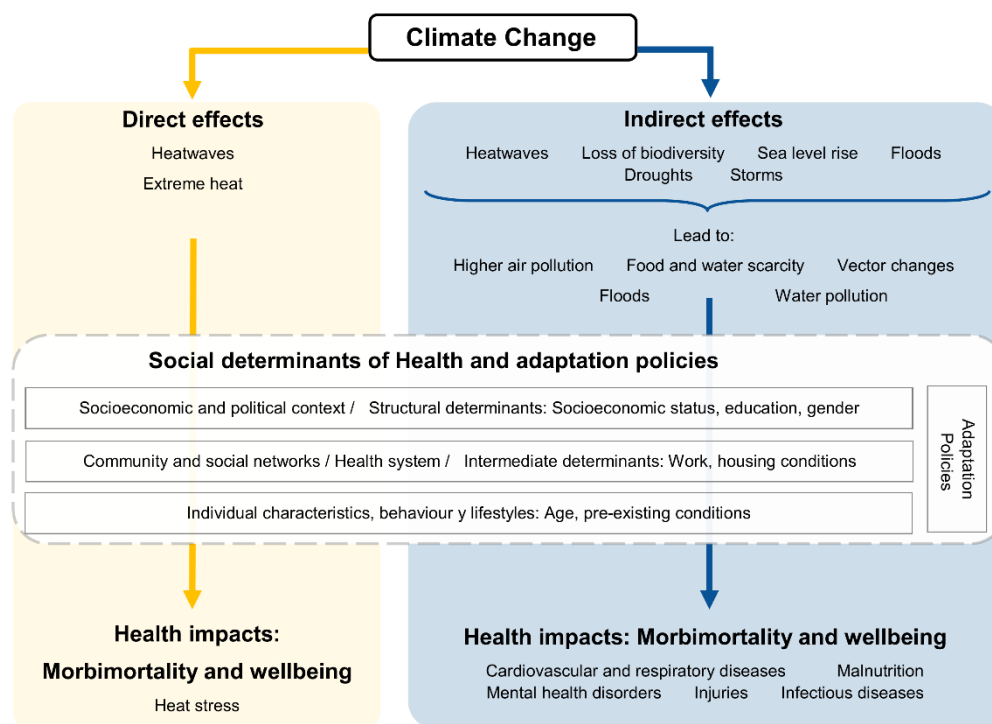
The United Nations Framework Convention on Climate Change (UNFCCC) in Article 1 of its declaration defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (United Nations, 1992).

All these changes in the climate system have a domino effect on other natural systems, including human systems. There is sufficient evidence as to how the effects of climate change negatively impact population health, with the most vulnerable populations generally being the most affected.

Climate Change and Human Health: A Close and Dangerous Relationship

This section analyzes the main effects of climate change on human health by separating them illustratively into direct and indirect effects (Figure 3).

Figure 3. General diagram of the effects of climate change on population health.



Source: Palmeiro-Silva, Cifuentes, Cortés, Olivares & Silva, 2020.

One direct effect is an increase in ambient temperature, which can lead to extreme heat events and heatwaves. These phenomena affect people's well-being and health by causing headaches, excessive sweating, dehydration, heat exhaustion and even heatstroke, which can result in hospitalization or death. Generally, the most vulnerable individuals, like young children, older adults, people with underlying illnesses or taking certain medications and outdoor workers exposed to the sun, tend to experience these types of symptoms and conditions to a greater extent. Vulnerabilities to heat can be both physiological and social. Evidence has shown that people with low income, living in areas with fewer green spaces and higher social insecurity, tend to be more impacted (Kim et al., 2020).

The analysis of historical information on days of extreme and heatwaves shows that hot days and nights as well as heatwave events have increased worldwide (IPCC, 2022). Moreover, it has been evidenced that these events are associated with increased mortality. For example, in Europe in 2003 and in Russia in 2010, more than 70,000 deaths occurred due to these events (Shaposhnikov et al., 2014; World Health Organization, 2022). Climate projections suggest an increase in the number of these events (IPCC, 2022), which poses a risk to population health and could put pressure on healthcare systems to act quickly and timely.

Climate changes trigger other environmental changes. The following describes how these changes can affect the population:

- **Sea-level rise and coastal erosion:** Between 1901 and 2018, the average sea level has risen by 0.20 meters (IPCC, 2022). The main causes of this increase are the melting of large ice sheets covering polar regions and the thermal expansion of oceans. The effects of this rise affect populations in low-lying areas like islands, riverside areas and coastal regions. These settlements are adversely affected by i) intrusion of saltwater into agricultural areas and freshwater sources; ii) direct damage to critical infrastructure, such as housing and cultivated areas, which forces people to leave their homes and move to safer locations; iii) increased likelihood of the spread of marine bacteria, mainly of the *Vibrio* genus.

- **Changes in precipitation patterns:** Changes in the climate system have caused shifts in precipitation patterns worldwide, which have resulted in deficits in certain areas and increases in others, leading to flash floods and flooding (IPCC, 2022). These changes in patterns are primarily associated with two phenomena relevant to human health: floods and flash floods and droughts. On the one hand, floods and flash floods directly affect people's material well-being, such as homes and essential living supplies, including food availability. On the other hand, these phenomena can result in diseases, mainly infectious diseases caused by the mixing of contaminated water and drinking water, as well as injuries or death. Droughts, in turn, threaten people's well-being and health, as there is no availability of fresh water for human consumption or for irrigation of crops, which poses a double risk to the population.

- **Food and agriculture:** Food is an essential part of people's lives. Currently, enough food is produced in the world to feed 11 billion people; however, one-third of it is wasted and millions of people still suffer from hunger (WFPUSA.). Inadequate food management and deficient food systems, combined with climate change, result in ongoing GHG emissions, food waste and food insecurity. Evidence has shown that climate change could affect the viability of plantations in certain areas of the planet, as well as the nutritional composition of certain crops like corn and rice (Myers et al., 2014). These changes in the quantity and quality of crops can lead to malnutrition problems in certain populations, with the most vulnerable being severely affected.

- **Forest fires:** Climate change is associated with an increased frequency and intensity of forest fires, which occur for various reasons. Natural forest fires are necessary for healthy forest growth, but the risk to human beings arises when these invade high-risk fire territories. Moreover, most fires are caused by human actions rather

than spontaneous combustion. Fires occur due to a combination of factors: improperly extinguished campfires, half-extinguished cigarette butts, glass bottles or lighters left in wooded areas can trigger the start of a fire. Additionally, climatic conditions such as wind, high temperatures and drought can worsen the forest fires. These conditions are partly influenced by climate change. The effects of forest fires on population health are well known and include mental health effects, direct injuries and even death, as well as an increase in air pollution, which contributes to respiratory and cardiovascular diseases (Holm et al., 2021).

- Air pollution: The use of fossil fuels has global and local effects. Globally, the increase in greenhouse gas emissions leads to global warming and climate change. Locally, pollutants near the ground directly impact the health of millions of people. In particular, the combustion of gasoline or oil engines produces volatile organic compounds that interact with solar radiation, which results in tropospheric ozone (O₃), which is highly irritating to human respiratory systems. Furthermore, the use of fossil fuels releases other gases, black carbon and particulate matter 2.5, which also cause certain respiratory and cardiovascular diseases (Karanasiou et al., 2021).

- Expansion, reproduction and survival of mosquitoes and other vectors: Changes in precipitation patterns and temperature can alter the viability of the geographic expansion, reproduction and survival of certain vectors, especially mosquitoes. Various insects carrying viruses or parasites thrive in warmer and more humid environments. Climate change could cause the expansion of a geographic area that favors these vectors and put the health of millions of people at risk, not only in tropical regions but also in mid-latitudes. Malaria is one of the main public health problems, a disease transmitted by the *Anopheles* mosquito, which carries the *Plasmodium* parasite. This mosquito thrives under optimal temperatures between 15 and 32°C and 50-60% humidity. Projections suggest that this mosquito could migrate to other geographic areas and expand its range and potential malaria transmission to a larger population (Caminade et al., 2014).

Inequality and climate change

While the evidence clearly shows the effects of climate change on different natural and human systems, including potential impacts on population health, social factors can magnify or mitigate the impact of these effects on the population and are known as social determinants of health (Figure 3). For example, floods and subsequent crop losses directly affect economic and social systems, which potentially exacerbate geopolitical conflicts between and within countries. This undoubtedly impacts the well-being and health

of the population by creating a vicious cycle of inequities, poverty and poor health. This reinforces the need for clear policies to reduce the climate impacts on natural and human systems by decreasing social inequalities. In this sense, climate change is not only a phenomenon analyzed from a physical point of view but also from a social, political, economic and cultural perspective (Malone, 2009).

Furthermore, the richest 10% of the population generates 52% of the total emissions between 1990 and 2015 (OXFAM, 2022). However, the consequences of climate change are observed in all regions and particularly affect those that have contributed least to global GHG emissions. In this regard, climate change is primarily an ethical problem and a matter of global justice which exposes structural and power inequalities that primarily affect vulnerable countries and marginalized groups in society (women, children and indigenous communities) (Markandya, 2011). These inequalities manifest themselves across a wide range of dimensions, from the consequences of disaster risk exposure (80 times higher in countries with emerging markets) (Malone, 2009) to the way in which rich countries dictate terms in international climate change negotiations (Okereke, 2010).

The scientific evidence regarding the occurrence of anthropogenic climate change and the magnitude of its consequences is robust; however, political action has been criticized for its slowness. The next section discusses areas of action on climate change at international, regional and national level.

Climate action: Characterized by slowness and missed opportunities

An article published by the New York Times in 2018 argued that major world powers wasted an opportunity between 1979 to 1989 to create a global framework for reducing carbon emissions. The statement mentioned that that decade was an opportune time for the development and implementation of climate change policies. This was because of the widespread agreement among powerful nations and scientific consensus reached on the first climate change conference held in Geneva in 1979. Despite the favorable policy climate in the 1980s, the inability to formulate any concrete global action during that time prevailed and led to the rapid progression of climate change. This missed opportunity may have worsened the direct impacts of climate change and, more importantly, indirect impacts like the mental health repercussions in children.

Actions on climate change at global level require significant political commitment because the goal of reducing CO₂ emissions involves changes in economic, social and industrial systems, in the present and in the future. Additionally, responsibility for emissions must be differentiated among

countries due to historical patterns of greenhouse gas emissions. These are the main reasons why countries negotiate their commitments on reducing CO₂ emissions at the international level. To understand the progress and current state of climate change policies and appreciate what has been done in terms of climate adaptation and mitigation, it is necessary to be familiar with the most important political milestones on climate action.

Relevant milestones in international climate action

As introduced earlier, due to the history of greenhouse gas emissions, climate responsibilities are shared but differentiated, as “developed” countries have a higher burden of historical emissions compared to emerging economies, like most nations in Latin America and Africa and some in Asia. The problem is that climate action is now urgent, and while it is necessary for all countries in the world to reduce their emissions now, discussion is ongoing about the justice for those who historically had a low emissions burden and are strengthening their development at the cost of generating greenhouse gas emissions.

Although the scientific evidence regarding global warming and climate change has been robust for several decades, political climate action began to gain momentum in 1977 when the executive committee of experts on climate change of the World Meteorological Organization reaffirmed the general scientific expectation of global warming and the need for better use of climate knowledge. This led to the organization of the first World Climate Conference in 1979, where scientists from different countries discussed climate and public policies, global systems, human influence on the climate system and its possible impacts, as well as land use and forests. This conference called for the need for international leadership and cooperation to conduct further research on the subject and generate better evidence (Zillman, 2009).

Later, the World Commission on Environment and Development, also known as the Brundtland Commission, in 1987 emphasized that global warming, due to the accumulation of greenhouse gases in the atmosphere, could be a significant threat to the sustainable development of humanity (Brundtland Commission, 1987). As a result, the 43rd session of the United Nations General Assembly established the Intergovernmental Panel on Climate Change (IPCC) to “*provide internationally coordinated scientific assessments of the magnitude, timing and potential environmental and socioeconomic impacts of climate change and realistic response strategies*” (United Nations, 1989).

The IPCC has already produced six assessment reports, the first in 1990 and the latest published in 2021-2022. These reports evaluate and

analyze the available scientific evidence to inform the population and decision-makers particularly on the development of public policies on climate change and the negotiations associated with the United Nations Climate Change Conference.

Another important event in the history of climate negotiations took place in 1992 in Rio de Janeiro, Brazil. During this Earth Summit, different countries signed the formation of the United Nations Framework Convention on Climate Change, which establishes a series of basic obligations to regulate greenhouse gas emissions and collectively address climate change. The members of this Convention, called Parties, commit to taking climate action to achieve stability of greenhouse gas concentrations in the atmosphere at levels that would prevent anthropogenic interference with the climate system (United Nations, 1992). To operationalize the work of the Convention, it is implemented through the Conference of the Parties (COPs), where global negotiations and decisions take place. The first COP was held in 1995 in Berlin, Germany, where the Parties agreed on the need for stronger commitments for developed countries beyond the commitments of the Convention. As a result, the Ad Hoc Group on the Berlin Mandate was established, which discussed and drafted the Kyoto Protocol (UNFCCC, 1995).

The Kyoto Protocol is the first treaty for the reduction of greenhouse gas emissions and was formally adopted in 1997 (COP3) in Kyoto, Japan. This protocol legally binds developed countries to specific emission reduction targets within specific time periods. It includes greenhouse gases such as CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆). The protocol also establishes three flexible market-based mechanisms: International Emissions Trading (IET), Clean Development Mechanism (CDM) and Joint Implementation (JI). The key areas of mitigation addressed by the protocol include energy, transportation, industry, agriculture, forestry and waste management (UNFCCC, 1997).

This protocol entered into force in January 2005 at COP11 in Montreal, Canada, where more than 55 parties ratified it. The protocol's initial expiration date was 2012, after which negotiations began for the subsequent agreement, the Paris Agreement.

In 2015, COP21 held in Paris, France, marked the adoption of this new agreement, which would come into effect in 2016. The Paris Agreement recognizes that climate change and its impacts affect all parties and that climate actions are intrinsically linked to sustainable development, poverty eradication, the conservation of sinks and the protection of biodiversity, among other issues. Therefore, the purpose of this Agreement is to “strengthen the global response to the threat of climate change, in the

context of sustainable development and efforts to eradicate poverty, by keeping the global average temperature increase well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels” (UNFCCC, 2015). One of the most important aspects of the agreement is the call for all parties to prepare, communicate and maintain ambitious efforts through Nationally Determined Contributions (NDCs), aiming for national mitigation and adaptation goals. These NDCs were to be submitted from 2015 and updated every five years. As of July 2022, the agreement has been signed by 193 out of 197 parties (UNFCCC, n. d.).

Significant milestones in regional climate action: Latin America and the Caribbean Historically, Latin America and the Caribbean (LAC) have been a region with low greenhouse gas emissions as it contributes less than 10% of the total global emissions. Brazil and Mexico are among the major contributing countries, with the energy, agriculture and forestry sectors accounting for 42%, 28%, and 21% of total emissions, respectively. Despite the relatively low emissions of each country in the region, the effects of climate change have been observed in each of them, with unfavorable climate projections.

In general, since 1970, there has been a cross-cutting concern in LAC regarding the importance of environmental policies and ecosystem preservation, although cooperation between countries is quite limited. Additionally, LAC does not act as a single block in international climate change negotiations: there are different groups within LAC, such as the Latin American and Caribbean Group (Grulac), the Bolivarian Alliance for the Peoples of Our America (ALBA) and the Independent Association of Latin America and the Caribbean (AILAC), which greatly limits the potential strengthening of the region’s negotiating capacity. Since the region has limited historical responsibility for greenhouse gas emissions but is and will be significantly affected by the impacts of climate change, it is essential for LAC to participate resolutely and in a coordinated manner in seeking robust alternatives for the necessary adaptation and mitigation strategies in the region, considering each country’s specific vulnerabilities.

In terms of international commitments by countries in the region, most countries have updated their NDCs, but with limited climate ambition. Furthermore, when analyzing the second round of submissions, these commitments vary significantly among countries, due to factors like political commitments, technical capacity, data availability or evidence for decision-making. This partly demonstrates the high variability and lack of collaboration and coordination in the region for commitments and climate negotiations.

Given the characteristics and social vulnerabilities in LAC, along with

the low levels of economic income in countries, it is very common to observe different global support initiatives. An important initiative in promoting dialogue and cooperation in the region is the Latin America and Caribbean Climate Week (LACCW), which serves as a platform for discussing key climate challenges and opportunities, as well as promoting and driving climate action among different actors in the region (UNFCCC, 2022).

There are various international funds and programs that strengthen climate adaptation and mitigation capacities and measures. One of the most relevant is Euroclima+, a program for environmental sustainability and climate change between the European Union and Latin America. Its objective is to strengthen governance and climate public policies and support specific projects in forestry, energy, water, risk management, urban mobility and food production (European Commission, 2022c). Currently, some active projects in the region focus on sustainable management of non-timber resources in Peru and Bolivia (European Commission, 2022b) and improving living conditions for indigenous and creole populations in Argentina and Paraguay (European Commission, 2022a), among others.

Other important funds come from the United Nations Program and include the following: i) Regional Platform for Innovation and Transfer of Technology for Climate Change (Regatta) which strives to strengthen capacities and knowledge exchange in LAC; ii) MOVE, which seeks to accelerate the transition to electric mobility in LAC through capacity building; iii) CityADAPT, which promotes climate resilience in urban areas; iv) Microfinance for Ecosystem-based Adaptation (MebA), which focuses on rural and peri-urban populations, and v) the United Nations Collaborative Initiative on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD), which seeks to reduce emissions from deforestation and forest degradation (United Nations, 2017).

Significant milestones in national climate action: Chile

In terms of public policies, environmental and climate institutional frameworks in Chile are relatively new, and policies have been established mainly in response to the international agenda rather than based on national interests and priorities (Bergamini et al., 2017). Following the 1992 Earth Summit in Rio, in 1994 the Chilean government approved Law No. 19,300 which promoted the creation of the first governmental institution responsible for environmental issues, the National Environment Commission (Conama) (Government of Chile. Ministry General Secretariat of the Presidency, 1994). This commission coordinated environmental actions, however, it was not a ministerial body, and its actions and influence were quite limited.

By 2005, the Organization for Economic Cooperation and Development (OECD) recognized the importance of the relationship between Chile and other OECD members by highlighting the country's economic and social growth and urging it to protect the environment and its natural resources through 52 recommendations. These emphasized greater environmental institutionalization, the improvement of information systems, laws to protect biodiversity, proactive climate responses, etc. (OECD, 2005). Considering this analysis and other policy concerns, the Chilean government worked to meet OECD standards and was invited to become a member of the institution in 2009 and signed the agreement in January 2010 (OECD, 2010).

Since then, the environmental institutional framework has been strengthened, with new obligations established in different areas, including environmental protection. Thus, in 2010, the Ministry of the Environment, the Council of Ministers for Sustainability, the Environmental Assessment Service and the Superintendence of the Environment were created (Government of Chile. Ministry General Secretariat of the Presidency, 2010); however, serious problems still exist in terms of oversight, regulations, cooperation between institutions and institutional jurisdiction.

Chile is a member of the UNFCCC and has ratified both the Kyoto Protocol and the Paris Agreement, in addition to submitting its NDCs in 2015 and 2020. However, climate commitments and actions are still limited and weak, especially in terms of health and climate change: national GHG emissions have been increasing steadily. The latest measurement in 2013 revealed a total of 70,054 gigatons of CO₂ equivalent emissions, considering land use, land-use change and deforestation (Government of Chile. Ministry of the Environment, 2018b).

Strategies include the National Climate Change Action Plan 2017-2022, an integrating instrument of climate-change policy that includes actions from different ministries and services. This plan considers four pillars of action: 1) adaptation, 2) mitigation, 3) means of implementation and 4) regional and local climate change management. It also provides an operational structure for the development and implementation of nine sectoral plans: agriculture and forestry, biodiversity, fishery and aquaculture, health, infrastructure, cities, energy, water resources and tourism (Government of Chile. Ministry of Health and Government of Chile. Ministry of Environment, 2017).

In 2018, the Fourth State of the Environment Report established that the main challenges are related to environmental institutional framework, air quality, biodiversity, circular economy, waste management and climate change. It emphasized the importance of achievements in policies and

regulations on these issues, even though Chile lacks a political and institutional framework that establishes climate-change commitments or activities. The Ministry of the Environment only coordinates climate-change policy, while other ministries control implementation and resource allocation. Responsibilities are thus divided among different ministries, citizen participation and commitment.

According to the latest NDC submitted in 2020, the country commits to a series of goals in line with the 2030 Agenda. In terms of mitigation, some of the measures the country commits to include “a greenhouse gas emissions budget that will not exceed 1,100 megatons of CO₂-eq between 2020 and 2030, with a maximum of GHG emissions by 2025” and “a reduction of at least 25% in total black carbon emissions by 2030 compared to 2016”. Specifically for health, it is stated that “by 2030, 100% of the health sector’s goals of the 2030 Agenda will be achieved.”. Unfortunately, no specific goals are set to protect health from the impacts of climate change or potential co-benefits of mitigation (Government of Chile. Ministry of Environment, 2020).

Finally, in 2019, work began on the Climate Change Framework Law, which strengthens climate governance by granting powers and obligations to state agencies for climate action. It sets a carbon neutrality target by 2050, which requires assuming climate commitments. This law was published in the Official Gazette on June 13th, 2022 (Government of Chile. Ministry of Environment, 2020).

Opportunities for action and potential strategies to strengthen climate action and health protection

This section presents some potential actions and strategies to strengthen climate action and health protection for the population. While not intended to be exhaustive or unique, these measures could enhance the processes and roles of certain key actors at different levels of organization.

Climate and health actions, in general, require intersectoral collaboration at different levels of organization. In this sense, strategies are proposed at global, regional, national, local and individual level. At each level, different key actors implement the action strategies.

Global-level strategies

Climate negotiations should focus on reducing greenhouse gas emissions by taking the need for justice among different countries into account. The reduction of greenhouse gas emissions cannot continue to be postponed by

the most industrialized and largest emitters of greenhouse gases, such as China, the United States and the European Union, which together are responsible for approximately 45% of the emissions (Friedrich et al., 2020).

Institutions such as the United Nations and the World Health Organization need to strengthen their role and leadership by taking strong initiatives to promote ambitious, prosperous, fair and binding negotiations in terms of climate action and population health protection. Furthermore, the IPCC plays a key role in providing syntheses of scientific evidence for decision-makers, so its role should be central in international negotiations.

Global non-governmental organizations (NGOs) and globally reaching academic institutions play a crucial role in facilitating discussion and disseminating information, among both experts and non-experts in the field. NGOs generally have specific advocacy goals, which provide valuable information for the discussion on climate action and health protection. Academic institutions aim to educate future professionals who are global citizens committed to climate action and health. These individuals will be responsible for acting in different instances, from participating in climate negotiations to providing care for people affected by the impacts of climate change in different locations. Therefore, academic institutions should incorporate climate action-related training activities across their curriculum. Additionally, research produced by academic institutions should strongly incorporate elements of climate action to strengthen the body of evidence for better decision-making.

Regional-level strategies

The Latin America and Caribbean region faces concurrent climate and health threats and vulnerabilities. On one hand, the effects of climate change affect every country in the region and increase the risk of infectious and vector-borne diseases, as well as flooding and droughts, which jeopardize development, well-being and population health. On the other hand, social and health inequities are significantly high, which magnifies the effects of climate change on the most vulnerable populations. Moreover, weak governance and lack of climate collaboration among countries further exacerbate these challenges.

In this regard, collaboration and cooperation among countries must be strengthened through technical and political capacity building for climate action and health. Joint strategies should also be developed to enhance communication and information sharing, to consolidate a powerful regional negotiating capacity at international level.

An important element for academic institutions to consider is the

training of healthcare professionals in climate issues. Evidence shows that they have incorporated the topic of climate change weakly into their curricula, which jeopardizes the important role of healthcare professionals in both direct care and advocacy in this field (Palmeiro-Silva et al., 2021). In this regard, the creation of minimum regional standards for the training of these professionals based on climate and health requirements could be assessed.

Additionally, research done by academic and research institutions should focus on the current needs of the population and have an impact on public policies in the field, as well as informing decision-making. Research in Latin America is proposed to be transnational and co-produced together with communities and decision-makers. Community empowerment, access to and understanding of information are key for healthier and more resilient communities capable of making informed decisions.

National-level strategies

Although climate governance and institutional capacity in Chile have become stronger in recent years, there is still much progress to be made. Climate policies, both mitigation and adaptation to climate change, need to be more ambitious and prioritize the well-being and health of the population while considering territorial relevance. The latest Nationally Determined Contribution submitted to the UNFCCC only mentions the health of the population as an important aspect, but there are no explicit measures on health adaptation.

Furthermore, citizen participation in the formulation of climate and health policies needs to be strengthened, especially among the most vulnerable communities affected by climate change in the country.

Finally, the generation of data and scientific evidence related to climate change and health is an urgent need in the country. This would allow for better decision-making at national, regional and local level. The creation of integrated information systems should be promoted to monitor the threat of climate change, as well as the degree of population exposure and vulnerability through an approach based on social determinants of health.

Opportunities for a green, sustainable, and healthy post-Covid-19 recovery

The Covid-19 pandemic presents an opportunity for a green, sustainable and healthy social and economic recovery. Unfortunately, some economic obstacles to achieve this recovery are market disincentives, mainly associated with low fossil-fuel prices, which hinders sustainable innovation in this area. To address these difficulties, it is essential to abolish subsidies and increase taxes on the use of fossil fuels, thereby inhibiting the use of this type of energy sources. The transition to sustainable fuels requires long-term commitments over a period of no less than 5 to 10 years, involving public investment and pricing and tax reforms for the industry. Priorities for public investment should focus on providing economic support to the public and private sectors for sustainable innovation in infrastructure development, transportation systems and sustainable cities. This type of development brings not only economic but also social and environmental benefits.

In this regard, governments should consider establishing a sustainable and healthy national development plan to favor public policies that reduce negative externalities of certain actions on the environment, the economy and the social development of the population. Some key areas to be promoted include decarbonization and transition to a low-carbon energy matrix, strengthening energy efficiency policies and reducing energy poverty, promoting a circular economy, sustainable production and development, disaster risk reduction, strengthening climate governance and sustainability and promoting regional and global collaboration strategies.

Humanity is at a crucial moment for climate action and the protection of population health. Scientific evidence has been robust and clear, and now is the time for greenhouse gas emission reduction policies to be urgently implemented internationally, which requires cooperation, understanding and justice among countries. Policies that advocate for a healthy, sustainable and just development will enable the prosperous development of society and the environment and reduce the inequities that currently affect millions of people worldwide.

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PART III.

PREVALENT HEALTH PROBLEMS IN A GLOBALIZED WORLD

8. Emerging and Reemerging Diseases in the Context of the Current Sociosanitary Crisis

Valeria Stuardo Ávila

A new epidemiological transition

In 1971, epidemiologist Abdel Omran first established the concept of epidemiological transition, referring to the shift in patterns of health and disease from being predominantly driven by infectious diseases to degenerative diseases. He directly linked this change to population structure (Omran, 1971). For about half a century, non-communicable chronic diseases have been highly relevant due to their significant impact on global morbidity and mortality. However, the Covid-19 epidemic demonstrates that we might indeed be witnessing a new epidemiological transition. This major humanitarian and health crisis forces us to examine the effects that globalization has had on current patterns of health and disease, as communicable diseases reclaim their role.

The health emergency caused by the SARS-CoV-2 virus, which originated in Wuhan, China (Hui et al., 2020), at the end of 2019, poses a challenge for societies and global health. It challenges not only our understanding of epidemiological transition but also the positivist concept of 19th-century epidemiology. Communicable diseases are reemerging as a real problem that affects not only the most disadvantaged societies but also economically developed countries.

Emerging and reemerging diseases have been of great interest in public health in recent decades. This has been driven by community research that emerged from the HIV/AIDS pandemic in the early 1980s and has become a focus of research and study across different disciplines (Valdés García, n. d.). Currently, public health is interested in investigating their social determinants and the causes behind their reactivation. Some authors consider emerging and reemerging diseases a controversial topic that undoubtedly points to a major problem in human health and breaks away from the linear process of health based on development and epidemiological transition, as popularized in some literature (Franco, n. d.). Behind these new paradigms, a sociocultural perspective becomes crucial, and it is essential to study health phenomena outside a reductionist approach and prioritize social complexity.

Due to their dynamic characteristics, the causes of the emergence and reemergence of communicable diseases need to be studied in a global context, as they are subject to various social determinants. Literature

suggests that a comprehensive approach is needed to address the study of emerging and reemerging diseases (Barreto et al., 2011; Braveman, 2011; WHO Commission on Social Determinants of Health, 2008; Heymann, 2005; Semenza et al., 2010). Integrated and multisectoral approaches should also be considered for their control and elimination to ensure rapid responses, community-level preventive interventions, access to healthcare systems including timely diagnosis and appropriate treatment that address the social determinants responsible for most health inequalities (Ehrenberg & Ault, 2005; Schneider et al., 2011).

Some authors even propose transforming epidemiological categories to understand the social processes behind certain diseases. Thus, the transmission process could shift from a simple mobilization of an infectious agent to being described as a dynamic process arising from the interaction of various factors, or, in other words, the contagion process as a product of the historical and social context (Piñeros, 2010).

In this way, we can not only analyze the etiopathogenesis of diseases (causes and mechanisms of a disease) from an etiological perspective but also examine, from a sociocultural perspective, the conditions in which people live, work and interact, which are the “causes behind the causes” of disease.

Social Impact of Emerging and Reemerging Diseases

It is very likely that we are currently witnessing a new epidemiological transition which was initiated by one of the worst pandemics of the last century, expressed in its consequences by the significant social impact it has caused while affecting different territories differentially. Although the current socio-sanitary crisis affects all countries in the world, it does not affect all populations equally.

This crisis has once again highlighted that social inequalities disproportionately affect the most vulnerable people most. The SARS-CoV-2 pandemic has spread within countries and marginalized populations such as ethnic minorities and those with low socioeconomic status are being disproportionately affected (Greenaway et al., 2020). Migrants, for example, may be particularly vulnerable to the direct and indirect impacts of Covid-19 or certain sexually transmitted infections.

Migrant population

The ability of migrant populations to receive adequate medical care and cope with the economic, social and psychological impacts of the pandemic can be affected by a variety of factors often related to their migration status. These

include their living and working conditions, lack of consideration for their cultural and linguistic diversity, xenophobia, limited knowledge and local networks and their level of inclusion in host communities (The Lancet, 2006) (Guadago, 2020).

In many countries, migrants do not benefit from the same access to healthcare as the citizens of receiving countries, especially when their situations are irregular or they have short-term visas. Poorly managed, inadequate or discriminatory responses from health and immigration systems can have multiple negative consequences for the health of migrants and the communities they interact with (Vearey et al., 2020) (Van Durme, n. d.). Lessons from previous epidemics show that health inequalities and underlying health conditions could specifically and disproportionately affect morbidity and mortality among disadvantaged populations (Quinn & Kumar, 2014; Shaaban et al., 2020).

Various literature reviews have identified potential barriers to the use of health services by migrant populations. Among the findings, the influence of the healthcare system context stands out as an important determinant of differences in the use of primary and specialized care services (Pitkin Derose et al., 2009; Rivers & Patino, 2006). Access barriers linked to place of birth, language, religion, ethnicity, race and other cultural factors have also been identified. Social exclusion and discrimination are not only related to health access but also permeate all stages of the migration process (Abubakar et al., 2018; Scheppers et al., 2006). Irregular immigrants who have no access to health services or the ability to pay for their healthcare face countless barriers to accessing safe and legal employment. Fear of deportation has multiple effects on emotional well-being and mental health and impacts the willingness and ability to seek healthcare services (Foad et al., n. d.; Hacker et al., 2015).

The Covid-19 pandemic and the measures taken by some governments, including economic lockdowns, have resulted in reduced primary healthcare provisions in some places. This hinders access to basic public health programs such as vaccines, tuberculosis and/or HIV/AIDS treatment and sexual and reproductive health, including family planning (Regional Inter-Agency Coordination Platform (R4V), 2021; Guadago, 2020).

Sexual health

The recognition of sexual rights is inherent to sexual health, which implies that individuals have the right to sexual freedom, privacy, equity and pleasure, and to make free and responsible choices (WHO, 2002). Sexual rights include the right of all individuals, free from coercion, discrimination and violence, to the highest attainable standard of sexual health, including access to sexual and reproductive health services, seeking, receiving and imparting information related to sexuality and sexual education, among

others (WHO, 2017). The Sustainable Development Goals prioritize ensuring access to sexual and reproductive health services, including family planning, information and education and the integration of reproductive health in national strategies and programs. They also aim to eliminate all forms of violence against all women and girls in public and private spheres.

While studies show the emergence of certain types of communicable diseases among migrant populations, it is known that the contribution of migrants to the increased incidence of endemic diseases is related to the living and working conditions in which people arrive in countries and the weaknesses of systems to include these populations (Monge-Maillo et al., 2009; Valerio et al., 2009). It has been observed, for example, that limited access to preventive services, testing and vaccination, as well as other determining factors such as type of work, social and economic precariousness and cultural and emotional uprooting, can be risk factors for HIV and other sexually transmitted infections (Folch et al., 2009; Leyva-Flores et al., 2013; Caro-Murillo et al., 2010).

Health policies have predominantly focused on treating diseases without adequately addressing the underlying causes, such as actions within the social environment. Studies conducted in countries with a history of migration processes show an unequal distribution in the prevalence of gender-based violence according to country of origin, with migrant women being disproportionately affected. Additionally, the fertility rate among migrant women is higher than that of native women (Luque Fernández & Bueno-Cavanillas, 2009; Vives-Cases et al., 2009).

Accessible health services, both preventive and curative, can meet the healthcare needs of migrants before they become seriously ill, while thereby reducing overall costs for the health systems in receiving countries. This is evident in the case of movements across international borders, where delays in seeking care or treatment for infectious diseases such as HIV are associated with multiple factors, including fear of engaging with public services for individuals without defined legal status (Foad et al., n. d.). Certain groups of migrants, including refugees, asylum seekers and migrants in irregular situations, may be particularly vulnerable to infectious diseases and experience worse health outcomes than the host population (Hui et al., 2018).

Challenges for global epidemiological surveillance

The Covid-19 pandemic has also impacted global public health surveillance systems and has highlighted both their strengths and urgent challenges. A global response to epidemic outbreaks is required, as well as improvements

in local surveillance systems at the country level.

The global response to public health emergencies and the monitoring and evaluation system of the International Health Regulations (IHR) (WHO, 2005) is integrated through the Global Outbreak Alert and Response Network (GOARN). The GOARN is a mechanism of technical collaboration between institutions and networks that pool their human and technical resources to respond to health alerts and disasters worldwide. It consists of over 250 technical institutions and networks in more than 90 countries, including various United Nations organizations, humanitarian aid NGOs and representations of health ministries of countries adhering to the IHR.

The IHR, approved in 2005 and implemented in 2007, is an international consensus to prevent, protect, control and provide a public health response to risks related to epidemic outbreaks through a set of recommendations for international mobility in health emergencies (people, luggage, cargo, containers, transportation, postal packages, etc.). It establishes the basic rules for controlling different points of entry into countries (airports, ports, land border crossings), public health measures for travelers and various health documents.

The Director-General of the World Health Organization and its Advisory Committee and Independent Oversight for the WHO Health Emergencies Program determine whether a health emergency is a Public Health Emergency of International Concern (PHEIC). This is defined as “an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response” according to the International Health Regulations (IHR). When a PHEIC is declared globally, the primary objective is to ensure health security through the implementation of the IHR. Therefore, the entire global alert and response system of the WHO ensures event surveillance, rapid risk assessment, communication of necessary information for decision-making and effective coordination of response activities.

Since the implementation of the IHR in 2007, six PHEICs have been declared worldwide: Pandemic Influenza A (H1N1) in April 2009; international spread of wild poliovirus in May 2014; Ebola virus disease outbreak in West Africa in August 2014; a group of cases of congenital malformations and other neurological disorders associated with Zika virus in February 2016; Ebola-virus disease outbreak in the Democratic Republic of the Congo in October 2019; and the Covid-19 pandemic caused by the SARS-CoV-2 virus in Wuhan, China, in January 2020.

From a historical perspective, although public health surveillance can be traced back thousands of years, the modern concept of surveillance

originated during the time of epidemiologist John Snow (1813-1858), who linked epidemiological data on cholera outbreaks in London with community interventions. According to the WHO, public health surveillance is defined as “the systematic collection, analysis, interpretation and dissemination of health data for the purpose of public health action to reduce morbidity and mortality and to improve health”. The principles of public health surveillance involve addressing a defined public health problem by using data to guide efforts that protect and promote population health. Information from various data sources can be incorporated into public health surveillance activities, such as laws and regulations or social determinants of health.

One of the main components of public health surveillance is the systematic development of indicators. Other components include data collection, analysis and interpretation, and timely dissemination of findings. Additionally, the surveillance system should be capable of evaluating public health actions, including the surveillance system itself. The uses of public health surveillance data are varied and include early warning, impact assessment, development and implementation of interventions, evaluation of interventions, risk assessment, and support for public health research, among others (Choi, 2012; The World Bank, n. d.).

The term epidemiological surveillance was introduced by the WHO in 1965, and it is defined as “the epidemiologic study of a disease as a dynamic process involving the ecological relationships of the infectious agent, the host, the reservoirs and the vectors, as well as the complex mechanisms involved in the spread of infection”.

Some authors differentiate it from public health surveillance, arguing that epidemiology is a broader discipline that includes research and training. Others state that public health surveillance distinguishes itself by providing information to policymakers and program implementers; otherwise, it is simply health information and not surveillance information (Lee et al., n. d.).

The concept of epidemiological surveillance is particularly linked to the study of communicable diseases, a term that came into use with the HIV epidemic that began in the 1980s. In 1989, the WHO developed the first standards for HIV infection surveillance. In its early years, monitoring systems were mainly limited to the reporting of HIV/AIDS cases (first-generation surveillance/passive surveillance). With this type of surveillance, information from other sources was not available, the most vulnerable or exposed groups could not be identified and changes in epidemic trends could not be explained. This led to the development of second-generation HIV surveillance (active surveillance), which allows for the analysis of different factors influencing the behavior of the epidemic, such as social, economic and cultural aspects of HIV transmission and other sexually

transmitted infections (STIs). The main objective of second-generation surveillance is to monitor the epidemic and high-risk behavior trends to provide vital information for designing prevention programs and evaluating their impact. In general, second-generation HIV/STI surveillance is based on biological surveillance (sentinel serological surveillance of vulnerable populations, routine testing of blood donors, etc.), behavioral surveillance (repeated cross-sectional studies of the general population and specific subgroups) and other sources of information (HIV/AIDS case surveillance, death registries, etc.).

Different authors have discussed the future and challenges of public health surveillance. The main issues include improving surveillance towards a more comprehensive system for collecting data on risk factors, intervention and prevention strategies and exploring new solutions that involve investigating the interactions between biological, social, psychological and environmental factors. Other areas of focus include developing large-scale data collection systems based on the population and in support of universal and active surveillance, as well as multiple methodologies and systematic processes for selecting indicators. Additionally, linking the surveillance system with an efficient data-analysis system that can generate early warning signals for health trends and risk factors is important. Providing direct and effective mechanisms for supplying information in the public health decision-making process, developing better ways to disseminate information including risk communication and achieving health for all regardless of age, race or socioeconomic level, including the opportunity to contribute to the decision-making process, are also key goals (Choi, 1998, 2012; Choi & Pak, 2001; Hall et al., n. d.).

Conventional public health surveillance mainly relies on the reporting of disease cases through the healthcare systems of countries, allowing for the generation of statistics and a rapid response to events and health emergencies. However, it does not delve into the multiple determinants of disease, nor does it allow for the characterization or in-depth analysis of relevant aspects of health in vulnerable populations. Active surveillance, especially in bio-behavioral studies on HIV/STIs, could be considered an exception. Therefore, to expand the scope of current surveillance, there has been a discussion in recent years about the need for another approach - a broad approach that involves community members in identifying and reporting health events that occur in their areas. (Guerra et al., 2019).

Community-based surveillance (CBS) is an active participatory process aimed at detecting, reporting, responding to and monitoring health events in the community. Despite being an innovative strategy developed formally no more than 20 years ago, literature shows that CBS also presents a series of limitations and challenges, mainly related to its application in

studying epidemic outbreaks in low-income countries. Other areas that require improvement include reaching populations with difficult access, selecting suitable community members for data collection and reporting, integrating CBS into the overall surveillance system, expanding surveillance beyond low-income countries to where vulnerable populations are in need, prioritizing the determinants of disease (not just the disease itself) and connecting with community-based organizations for permanent data collection linked to formal health systems. (Guerra, Acharya, et al., 2019; Guerra, Bayugo, et al., 2019).

The Covid-19 pandemic shows that both global and local surveillance systems (within the framework of the broad concept of public health surveillance) will have to face the challenges related to the rapid spread of emerging and reemerging diseases and the significant social impact that these health crises generate worldwide, especially among disadvantaged populations. It will be necessary for the only currently available international consensus, the International Health Regulations (IHR), to adapt its content and scope to ensure that prevention and control measures of epidemic outbreaks are implemented equitably and reach everyone alike, in respect of human rights worldwide. Countries will also need to address the social impact of the epidemic from a systemic and integrative perspective, as well as articulate national initiatives to improve institutional frameworks, not only for providing rapid responses to health emergencies but also for having technical references that enable appropriate decision-making with a genuine population health perspective.

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9. Non-communicable diseases diet-related: A global health perspective

Lorena Rodríguez Osiac, Deborah Navarro Rosenblatt, Marcela Araya Bannout

Introduction

Non-communicable diseases (NCDs) refer to a group of non-infectious conditions with long-term health consequences, including cancers, cardiovascular diseases, diabetes, chronic lung diseases and mental health disorders. Many of these diseases can be prevented by reducing common risk factors such as tobacco use, harmful alcohol consumption, physical inactivity and unhealthy diets.

NCDs are the leading cause of death and disability worldwide and account for over 40 million deaths each year, which is equivalent to 71% of all deaths globally. Of these, 15 million are premature deaths, with a disproportionate burden on low- and middle-income countries, which leads to unjust and avoidable inequalities.

The Sustainable Development Goals prioritize health and well-being as a goal, but the world is falling short in achieving it. Reducing premature NCD deaths without addressing the underlying issues seems unlikely.

Unhealthy diets and their impact on our health and the planet are global problems. Despite some progress in addressing malnutrition, diets are becoming increasingly unhealthy and demanding on the environment, while unacceptable levels of hunger persist. Continuing this road will exact a high human, environmental and economic cost if left unchecked. The current focus on the global syndemic reflects the three major challenges we face today: malnutrition, obesity and climate change.

The Covid-19 pandemic highlighted that these diseases also act as risk factors for the severity and mortality of infectious diseases, which further emphasizes the relevance of this global health problem and the significant challenge it presents.

The aim of this article is to review the current epidemiological situation of diet-related NCDs, their determinants and possible evidence-based intervention strategies.

Epidemiology

To review the epidemiology, we will focus on the most prevalent diseases falling under the category of NCDs, particularly those related to diet and lifestyle. Mental health disorders will be excluded as they have specific factors and will be addressed in a separate chapter.

Obesity

Obesity is an inflammatory condition that can lead to the development of diseases such as type II diabetes, dyslipidemia, cardiovascular diseases and cancer. It is directly linked to high-energy diets, and various studies have shown that the consumption of ultra processed foods is associated with its development (Nardocci et al., 2019; OPS & OMS, 2015; Rauber et al., 2020; Sandoval-Insausti et al., 2020).

Apart from the SARS-CoV-2 pandemic, excess malnutrition represents the main public health problem in Chile and affects 74.2% of the adult population. Of pregnant women receiving care from the National Health Services 64% are affected and 54% of school children are affected. In adults, excess malnutrition is divided into 39.8% overweight and 34.4% obesity, while in pregnant women, obesity prevalence (32.37%) has surpassed overweight prevalence (31.84%). As for children, the figures show 29% overweight and 25% obesity (Ministerio de Salud de Chile, 2017).

Health surveys in Chile indicate that obesity is higher in women than in men (38.4% versus 30.3%) and in individuals with lower educational levels (46.6% in people with less than 8 years of education versus 29.5% in people with more than 12 years of education). (Junaeb et al., 2020).

Globally, according to the World Health Organization, in 2016, excess malnutrition in the adult population reached 52%, with 39% overweight and 13% obese (WHO, 2021b). In Latin America, prevalences are much higher with 83.6% excess malnutrition, with Mexico standing out with 75%, followed by Chile with 74% and in third place the USA with 71% (FAO et al., 2019).

Diabetes

There are two types of diabetes: insulin production failure and insulin resistance (Care & Suppl, 2018). The latter is closely linked to obesity (Leto & Saltiel, 2012). In Chile, the latest national health survey showed a diabetes prevalence of 12.3%, which is higher in individuals with less than 8 years of education (25.3% versus 7.7% in those with more than 12 years of education) (Ministerio de Salud de Chile, 2017).

Globally, in 2014, the WHO estimated a diabetes prevalence of 8.5% (WHO, 2016), and in 2019, the International Diabetes Federation estimated it at 9.3%. The majority of these individuals (79.4%) live in low- and middle-income countries. In the Americas region, prevalence is estimated at 9.5% in Central and South America and 13.3% in North America and the Caribbean (International Diabetes Federation (IDF), 2021).

Cardiovascular diseases

Cardiovascular diseases are a group of pathologies that represent the leading cause of mortality in Chile. These include ischemic heart diseases, cerebrovascular diseases and hypertensive disease. The latter is closely related to excessive sodium consumption (Rust & Ekmekcioglu, 2017). In Chile, the 2016-17 national health survey showed that the average daily salt intake per person was 9.4 grams, which is double the amount recommended by the WHO. The prevalence of hypertension was 27.6%, with a higher prevalence in individuals with lower educational levels (51% in those with less than 8 years versus 15% in those with more than 12 years of education) (Ministerio de Salud de Chile, 2018).

Hypertensive disease is itself a risk factor for ischemic heart diseases and cerebrovascular disease (American Medical Association, 2001; Cecchini et al., 2010). The WHO estimates that 1.13 billion people worldwide suffer from hypertension, 1 out of every 4 men and 1 out of every 5 women (WHO, 2021a). In a study conducted in 2014 with data from 135 countries, a prevalence of 31.6% in men and 25.3% in women was estimated in high-income countries, while in middle- and low-income countries, the prevalences were 31.7% and 31.2% in men and women, respectively. In Latin America and the Caribbean, prevalence was 30.4% for men and 32.7% for women (Mills et al., 2016).

Cerebrovascular diseases and myocardial infarction are also associated with high cholesterol levels resulting from a diet high in trans and saturated fats, as well as the condition of overweight or obesity (Cecchini et al., 2010). In turn, consumption of fruits, vegetables, dietary fiber and dairy products has been described as a protective factor for this group of diseases (Tong et al., 2020). In Chile, the prevalence of elevated cholesterol in the last national health survey was 27.6% (Ministerio de Salud de Chile, 2017). The same survey shows that self-reported acute myocardial infarction was 3.3% (3.8% for men and 2.8% for women) and 10% in the population aged 65 and older. For cerebrovascular disease (stroke or thrombosis), a prevalence of 2.6% was reported among the population aged 15 and older and of 8.2% in the population aged 65 and older (Ministerio de Salud de Chile, 2017).

Cancer

Cancer was already the leading cause of death in the country before the SARS-CoV-2 pandemic (INE, 2019). According to the American Institute for Cancer Research (AICR), the global incidence of cancer in 2018 was, in decreasing order, 11.6% for lung cancer, followed by breast cancer (11.57%) and colorectal cancer as third (10.2%) (World Cancer Research Fund & American Institute for Cancer Research, 2018).

In Chile, the highest incidence is for prostate cancer (12.3%), followed by colorectal cancer (11.1%) and breast cancer in the third place (10.1%). In terms of gender, in men, the leading cancer is prostate cancer (23.9%), followed by stomach cancer (12.5%) and colorectal cancer in third place (10.9%). In women, the highest incidence is breast cancer (20.8%), followed by colorectal cancer (11.3%) and gallbladder cancer in the third place (7,1%) (Parra-Soto et al., 2020).

Various studies have attempted to determine the relationship between food consumption, obesity and cancer. This relationship has been classified into 5 categories: 1. convincing evidence of decreased risk, 2. probable decreased risk, 3. probable increased risk, 4. convincing increased risk and 5. substantial effect on risk is unlikely (World Cancer Research Fund & American Institute for Cancer Research, 2018). According to this, it is found that:

- For prostate cancer, there is a probable increased risk in men with abdominal obesity and diets high in energy.
- For stomach cancer, there is a probable increased risk associated with salt-preserved or pickled foods in obese individuals with increased abdominal fat and alcohol consumption.
- For colorectal cancer, there is convincing increased risk with the consumption of processed meats in individuals with abdominal obesity and alcohol consumption, and probable increased risk with the consumption of red meats. However, there is a probable decreased risk with the consumption of whole grains, foods rich in dietary fiber and dairy products.
- For breast cancer, no direct relationship with specific foods has been found, but there is a probable decreased risk in women with higher body fat between the ages of 18 and 30 and for those who breastfeed. For postmenopausal breast cancer, there is convincing evidence of risk in women with abdominal obesity, weight gain in adulthood and alcohol consumption. Meanwhile, in premenopausal women, the association between alcohol and breast cancer is at the level of probability.

Determinants

80% of cardiovascular diseases and over 30% of cancers could be prevented by eliminating smoking, physical inactivity, harmful use of alcohol and unhealthy diets. Moreover, obesity, hypertension and diabetes resulting from these factors are also causes and risk factors for acute myocardial infarction, stroke and various types of cancer. All these factors and conditions are interconnected and it is not uncommon to find individuals who present 2 or 3 of these conditions (Chimeddamba et al., 2015).

Studies in Chile show that the prevalence of risk factors for NCDs is directly associated with age and inversely associated with socioeconomic status, and that women are in a disadvantaged position compared to men, even though women in practically all human societies have higher life expectancies than men, though not necessarily of good quality (Jadue et al., 1999).

The relationship between unhealthy diet, sedentary lifestyle, overweight, obesity and NCDs has been the subject of multiple systematic reviews that demonstrate the higher risk of cancer, coronary heart disease, stroke, diabetes mellitus, insulin resistance, hypertension and dementia in individuals who have poor dietary habits and do not engage in regular physical activity. Conversely, both a healthy dietary pattern and physical activity have consistently been associated with reduced risk across all categories of NCDs.

Globally, calorie intake from meat, sugars, oils and fats has increased over the past decades, while consumption of fiber-rich foods such as whole grains, legumes and roots has declined. The consumption of ultra-processed foods continues to rise rapidly, especially in low- and middle-income countries. Consuming red and processed meat increases the risk of developing colorectal cancer. Saturated fats and trans fats raise blood cholesterol levels and cardiovascular risk. Increased sodium/salt intake is a significant risk factor for hypertension, cardiovascular diseases and possibly stomach cancer. Diets high in meat and dairy products raise blood pressure. Overweight and obesity are associated with increased overall mortality and a higher risk of disease or death from cardiovascular diseases, diabetes and various types of cancer, partly due to elevated blood pressure, blood cholesterol, insulin resistance and inflammation. Energy-dense diets, ultra-processed foods, refined starches and sugary beverages contribute to overweight and obesity. Finally, smoking and air pollution are also associated with increased risk of NCDs (Peters et al., 2019).

Behind all these risk factors, various studies have shown that social

determinants of health strongly influence the presence of risk factors, causal factors and NCDs. Poverty, low education level, rapid urbanization, inadequate infrastructure and underdevelopment are common elements that affect countries, communities and individuals affected by NCDs. Situations of disaster, such as the Covid-19 pandemic, further impact these vulnerable populations with high NCD rates (Ngaruiya et al., 2022).

An intermediate social determinant that reflects how social position influences health is of great relevance to the described risk factors: the food environment. The notion of a food environment has gained value in the literature on dietary behavior as a fundamental factor in facilitating, obstructing and influencing choices and food consumption. Food environments refer to the environments that individuals and collectives use to produce, purchase, store, prepare, eat and dispose of food. Food environments are also influenced by macroeconomic policies and trade agreements between countries. Nowadays, food consumption is a globalized process, and an individual's behavior can only be oriented towards making healthy food choices if they are in an environment with availability and access to high-quality food. The model proposed by Gálvez and colleagues in Chile suggests that individuals circulate in mainly five food spaces: the domestic environment, the public environment, the institutional and organizational environment, the restaurant environment and the supply environment. These spaces are influenced by cultural and social dimensions and are interconnected through routines derived from individuals and collectives' lifestyles living in a common geographical territory (Espinoza et al., 2017).

The food environment is therefore the space where consumers interact with the food system to make their dietary decisions; hence, the quality of these spaces strongly influences the population's nutritional status. For example, ultra-processed foods, which are often high in calories, sugars, sodium and saturated or trans fats, and low in vitamins, minerals and fiber, are commonly more available and have a lower price than healthy foods, likely due to technological advances, market liberalization and advertising (HLPE, 2017; Monteiro et al., 2013; Popkin et al., 2012).

Therefore, dietary behavior and the population's nutritional status are not independent of food systems. The concept of a "global syndemic" brings together the three epidemics already described: obesity, malnutrition and climate change. These epidemics occur simultaneously, interact synergistically and share social determinants such as poverty and unhealthy food environments in the context of unsustainable food systems. This triad hinders the development of countries, communities and individuals and exacerbates other global health situations such as the Covid-19 pandemic. The concept of a global syndemic highlights that one of the most important challenges faced by humans, the environment and our

planet is the comprehensive and integrated approach to this problem by states. It recognizes that all necessary efforts must be made to overcome the underlying common factors, including transportation, urban design, land use, the economic model and extractive production. For instance, food systems not only drive the obesity and malnutrition pandemics but also generate 25% to 30% of greenhouse gas emissions (Horton, 2020; Martorell et al., 2020; Swinburn et al., 2019).

In conclusion, without considering the determinants of NCDs, it will not be possible to effectively combat them, and the solution is not simple.

Intervention strategies

To achieve successful interventions for the control of diet-related non-communicable chronic diseases, it is necessary to implement an approach and public policies that incorporate individual strategies throughout the life cycle. But even more importantly, it is crucial to consider a global perspective of the food system and social determinants by incorporating structural measures that enable access and availability to a healthy diet and physical exercise as well as regulations that promote sustainable production and marketing (Fuster et al., 2020; Hawkes et al., 2015; Sisnowski et al., 2017).

Starting from early childhood, measures that promote and encourage exclusive breastfeeding for the first six months, followed by the introduction of solids to support healthy habits, should be implemented. Among the most recommended and effective measures, the WHO indicates that the marketing of infant formulas and foods should be regulated, paid postnatal rest should be legislated and continuous training for healthcare teams should be ensured (Banos et al., 2019; Demirtas, 2012; Navarro-Rosenblatt & Garmendia, 2018; Rollins et al., 2016). When the preschool and school stages begin, not only healthcare teams need to be involved but also educators and the childcare and school community, as their role in shaping the food preferences of children and adolescents is well recognized (Findholt et al., 2011; Leng et al., 2017).

When children and adolescents start making decisions, they begin to be influenced by the food environments they are exposed to, whether at home, in their educational institutions or in their neighborhoods. Therefore, individual interventions alone are not enough. Structural policies that improve these environments become relevant.

Given the importance of improving food environments, in 2020, the World Cancer Research Fund (WCRF) published a report with

recommendations for regulating the advertising of processed and ultra-processed foods high in calories, fats, sugars and sodium (World Cancer Research Fund International, 2020). This document synthesizes the vast amount of research and international consensus on the effectiveness of food marketing control strategies targeting children and adolescents. The report emphasizes that protecting children and adolescents from excessive advertising exposure is a human right and that the implementation of strict and comprehensive public policies is imperative. An example of the impact of such policies in Chile is described in the study by Correa et al. (2020), which showed a 44% decrease in exposure to advertising of high-energy, saturated fat, sugar or sodium foods after the implementation of Law 20.606, which prohibits advertising to children under 14 years old for these foods. Exposure to unhealthy food advertising is higher among more vulnerable groups, including ethnic minorities and those with a lower socioeconomic status, as demonstrated by a study by Backholer (Backholer et al., 2021).

This analysis also suggests that some food and beverage companies may even target their advertising specifically to these groups.

To motivate behavioral change in people, it is relevant to captivate their attention, which is why new technological strategies such as the internet, social networks, mobile phone platforms and computer games have been tested to promote changes in lifestyle habits. One of these strategies is gamification, which uses games in non-habitual situations to induce implicit change without people realizing it (Chau et al., 2018; Mendoza & Fernández, 2016; Peña et al., 2019). In Chile, this strategy was implemented in schools in a municipality of the Metropolitan Region as part of the municipal program “Juntos Santiago” (Peña et al., 2019). Results showed that this technique, after 8 months, managed to decrease the body mass index (BMI) in the intervention group compared to the control group. Similar results were observed in the systematic review by Hamel and Robbins (2013), which determined the effect of interactive interventions on websites and computer games to increase fruit and vegetable consumption, decrease fat intake, reduce BMI and increase physical activity in children and adolescents. However, studies that included follow-up showed that these changes were not maintained after the interventions were finished.

Another type of strategy that has shown success in behavioral change is called “nudge,” which are subtle and non-forced motivational strategies that take advantage of the knowledge that food preferences are influenced by previous experiences, environmental factors, emotions and psychological factors (Leng et al., 2017; Marcano-Olivier et al., 2020; Walker et al., 2019). Various types of nudge interventions have been described (Bauer & Reisch, 2019), including the delivery of relevant information, the imposition of social norms, awareness raising, modification of food environments and the use of

targeted incentives to modify food choices. Interventions that include the delivery and increased availability of fruits, vegetables and water in cafeterias, food vending machines and school kiosks have also shown an increase in consumption and preference for these foods. Nutritional education interventions for parents, caregivers and educators have shown little to no effect on increasing healthy food products (Adam & Jensen, 2016; Hodder et al., 2019).

Considering that eating outside the home is becoming more frequent, different strategies have been tested to control the consumption of less healthy foods in these settings, like portion size reduction. They have not shown good results. Some small successes have been achieved when these were combined with menu labeling through a traffic light system or equivalent. Positive nutritional messages in restaurants and food stores increase consumers' knowledge about healthy options, make those foods seem less tasty and lead to underestimation of their caloric content, which reduces feelings of guilt when eating and inducing higher consumption (Oostenbach et al., 2019).

Front-of-package nutritional labeling has been recommended by various international organizations, including the World Cancer Research Fund (WCRF), as it has been observed to improve knowledge about the nutritional quality of foods and contribute to the selection of healthy foods, especially when using interpretive labeling models (through figures or images). In Chile, mandatory warning front-of-package labeling on foods has led to increased knowledge, changes in food selection and product reformulation by the industry which has projected a decrease in the intake of critical nutrients (Corvalán et al., 2021; Kanter et al., 2019).

The price of food is a very important variable among the determinants of behavior and can act as a barrier or facilitator to access, select and consume healthy foods or, alternatively, processed and ultra-processed foods (Bukambu et al., 2020). On this same topic, a systematic review of 160 studies on price elasticity of demand showed that eating out at restaurants and similar establishments is highly sensitive to prices, as well as the consumption of sugary drinks and meats. For example, a 10% increase in the price of beverages leads to a proportional decrease in consumption (Andreyeva et al., 2010).

In this regard, taxes on high nutrient-poor foods are a crucial structural and fiscal strategy to regulate food prices and they have shown positive effects in reducing the consumption of critical nutrients and processed and ultra-processed foods (Lhachimi et al., 2020; Pfinder et al., 2020). Similarly, like with front-of-package labeling, the World Cancer Research Fund (WCRF, 2018) published a report summarizing the available evidence regarding taxes on unhealthy foods in support of the

recommendations of the World Health Organization (PAHO, 2015) to apply taxes on sugary drinks as an effective strategy to reduce sugar consumption and prevent obesity and other diet-related diseases. Latin America has two leading countries in public food and nutrition policies related to taxes on unhealthy foods: Mexico and Chile. The results of the sugar-sweetened beverage tax implemented in Mexico (Sánchez-Romero et al., 2020) showed that after the implementation of taxes, the percentage of people consuming these beverages moderately to frequently decreased from 50% to 43%, while the percentage of non-consumers rose from 10% to 14%. Chile also shows a decrease in the consumption of sugary drinks after the implementation of taxes (Caro et al., 2018; Caro et al., 2020; Nakamura et al., 2018).

Likewise, subsidies for healthy foods as another structural fiscal measure have shown to be effective in increasing fruit and vegetable consumption in the population (An, 2013; Sisnowski et al., 2017). The recommendation from the WHO is to subsidize the price of fresh fruits and vegetables by at least 10% and ideally 30% of the baseline price (WHO, 2016). To achieve a greater impact, it is recommended to combine both fiscal policies: taxes on unhealthy foods and subsidies for healthy foods.

It is important to mention that there is also sufficient evidence showing that certain interventions have no impact on increasing fruit and vegetable consumption, decreasing the consumption of nutrient-poor foods or maintaining a healthy weight. These include the implementation of population food-based dietary guidelines (GABAs) (FAO, 1996), which are followed by less than 1% of the population in Latin American countries (FAO, 2014). Similarly, interventions that exclusively include food education programs have failed, without considering the influence of social determinants and the food environment on consumption habits and behavior (Contento, 2010).

Management of public policies

In the previous sections, we concluded that addressing this problem should be comprehensive and intersectoral and involve citizen participation. A strong narrative with argumentative content based on epidemiology, causal evidence and effective strategies should be developed to support well-founded lobbying efforts. An extensive mapping of stakeholders is necessary to identify the environment in favor or against potential policies and strategies that need to be implemented. This perspective should have a global scope, as many companies opposing these changes are international and exert pressure through their global associations, the World Trade Organization (WTO) and high-level political bodies such as foreign ministries.

An effective organizational approach should include an action plan that incorporates mechanisms to foster and coordinate social participation, considering that population health is the primary objective. People and communities should equitably benefit from the proposed interventions, which may require measures that prioritize vulnerable or disadvantaged groups.

A good action plan should also be intersectoral, with indicators and goals for different sectors, considering not only the reduction of mortality, morbidity and exposure to risk factors, but also the increase in exposure to protective factors by promoting well-being and reducing inequities.

Interventions, whether structural or individual, should be evidence-based to avoid investing time and money in strategies known to be bound to fail. For example, large-scale communication campaigns promoting healthy lifestyles will not be effective if food and community environments do not support and even act as barriers to the promoted choices. These actions should be complementary and simultaneous.

The World Health Organization proposes four strategic lines of action, which are summarized below (PAHO & WHO, 2013):

1. Strengthening and promoting multi-sectoral alliances with all relevant actors by integrating the importance of this issue into economic, academic and developmental agendas.
2. Reducing the prevalence of major risk factors for NCDs and strengthening protective factors by employing evidence-based strategies and policy instruments such as regulation and surveillance, while addressing social, economic and environmental determinants of health.
3. Improving coverage, access and quality of NCD care, with a focus on primary health care including prevention and self-care measures.
4. Strengthening countries' capacity for NCD surveillance and research and using the findings as a basis for policy development and implementation of programs and strategies.

Additionally, the NCD Alliance proposes four strategic pillars (NCD Alliance, 2016):

- Performing global advocacy to fulfill political commitments on the prevention and control of NCDs.
- Promoting accountability for commitments, resources and results in the prevention and control of NCDs.
- Strengthening the capacity of civil society organizations and alliances at national, regional and global level.

- Bridging the gap between evidence-based knowledge and policies and practices on NCDs, between knowledge generators and those responsible for implementing them.

The conclusion of this section is that form strong technical and political forces need to be formed that go beyond the national level to the regional or even global level, in order to implement strategies that often challenge the socio-economic model of countries and require progress on global equity agendas based on social determinants.

Conclusions and Challenges

NCDs are the leading cause of death and disability worldwide. The main determinants of the problem are adverse environmental conditions linked to globalization, urbanization and industrialization, which have pushed society towards consumption by changing dietary patterns, physical activity and overall lifestyles, which especially affects low- and middle-income countries. Evidence has shown that it is possible to reduce the incidence of NCDs and control their prevalence by reducing risk factors and increasing protective factors through individual and population-based interventions aimed at modifying social determinants and food environments that hinder/impede healthy choices.

The results of evidence-based public policies implemented for the control and prevention of obesity and NCDs suggest that the most successful strategies are those that incorporate changes at all stages of the life cycle and in the entire food system.

Structural-level strategies, such as taxes on high-nutrient foods and subsidies for healthy foods, are among the most cost-effective strategies to promote a healthy diet.

In summary, political commitment and strong global strategic alliances are required to combat the forces opposing change and achieve the goals set in the Sustainable Development Goals.

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10. An Updated Approach to the Concept of Global Mental Health

Jorge Ramírez Flores, Rubén Alvarado Muñoz

Introduction

Within the realm of Public Health, it is unlikely to find a concept more subjective than that of Mental Health. The mere mention of it evokes a diverse range of ideas and expectations, which makes definitions or classifications complex. When we extend this issue to the field of Global Health, where the historical, cultural and systemic differences among populations worldwide become apparent, we introduce another layer of complexity.

The term Global Mental Health has been employed as a sort of umbrella for various areas of work, such as epidemiological research, academic training, program funding and the development of policies or community action (Rajabzadeh et al., 2021). This holds significant implications for the field of Global Health, where variability in definitions is one of the major challenges when attempting to integrate Mental Health into different types of health projects (Patel et al., 2013).

This challenge is pertinent if we acknowledge that there is only one paradigm of Mental Health. However, from a constructivist epistemological perspective, as opposed to the more traditional positivist paradigm, Mental Health can have diverse conceptions in different places, cultures and historical moments (Restrepo & Jaramillo, 2012). In this light, the coexistence of definitions is not inherently problematic for research or social action.

The intersection of these two complex and expanding areas of scientific knowledge is intriguing. On the one hand, Mental Health has developed conceptually for over half a century, drawing from different disciplines and schools of thought that have been intertwined in various ways and with different scopes. On the other hand, and more recently, Global Health has experienced exponential growth in the past two decades, including the scenario shaped by the recent Covid-19 pandemic. In this article, we will provide a didactic view of Global Mental Health by presenting some elements of its current state in the world with an emphasis on our Latin American region and outlining the main challenges that we believe it will face in the coming decades.

A Conceptual Approach

To begin, we will discuss various ways of categorizing the primary paradigms on which Mental Health is based, which have gained recognition in recent decades. Using a familiar framework characteristic of Public Health, we can approach the analysis of this intersection through the two pillars that constitute “Global Mental Health”. On the one hand, the epidemiological and conceptual knowledge developed and, on the other, the study of organized societal responses. All of this is done while incorporating a global perspective.

The field of knowledge

There are currently several ways to categorize the diverse paradigms related to Mental Health. A relatively straightforward classification divides the possible frameworks in which Mental Health is defined into those linked to the biomedical sphere, those related to types of behavior and those derived from a socioeconomic perspective (Restrepo & Jaramillo, 2012). This serves as an initial approach and is somewhat connected to the areas derived from the classic definition of Health by the WHO in the mid-20th century which emphasizes “complete physical, psychological, and social well-being” (WHO, 2014).

At the beginning of this century, the WHO advanced and proposed a specific definition of Mental Health as “a state of well-being in which the individual realizes their own abilities, can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to their community” (WHO, 2004). Here, there is a clear move towards a more comprehensive understanding of the concept. However, its complexity makes practical application challenging and limits its operationalization for study.

New international initiatives have been proposed to achieve consensus on definitions related to Mental Health (Manwell et al., 2015). One of these initiatives presents various models to conceptualize Mental Health and has gained considerable acceptance in the last decade (Vaillant, 2012). Based on this, we can outline eight major frameworks that support Mental Health.

Mental health as the absence of mental disorders. This conception has a longstanding tradition in the clinical practice of mental health professionals, as their training primarily focuses on recognizing psychopathology. Currently, in the practice of most clinical centers and among the professionals working there, this paradigm is widely predominant. This is evident through the widespread use of classifications globally agreed upon such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) or the International Classification of Diseases (ICD).

Mental health as psychometric “normality”. This paradigm relies on empirical evidence and distinguishes between health and illness using psychometric instruments. This logic underlies the utilization of standardized psychiatric interviews for case identification in epidemiological or clinical studies, as well as a variety of instruments measuring different psychopathological phenomena, personality, intelligence, etc. Emphasizing the study of the validity, reliability, adequacy and screening capabilities of these instruments has enabled the application of the scientific method to investigate these issues and provide varying degrees of empirical evidence to clinical practice.

The concept of positive mental health. Marie Jahoda (1958) stands as the foremost exponent of this paradigm. In the mid-1950s, she synthesized existing knowledge in the field and developed a set of characteristics for the concept of mental health along with criteria for assessing mental health status. Despite the value of her work that offers conceptual clarifications and operational criteria to study mental health, there have been no substantial subsequent developments nor has empirical research been strengthened under this paradigm.

The model of Positive Psychology. It belongs to a long tradition within psychology, with notable contributors such as Abraham Maslow and Gordon Allport, who advanced the recognition of human needs and motivations as well as the concept of “mature personality”. In recent decades, Martin Seligman has further developed the concept of “learned optimism” based on progress made by cognitive psychology. This paradigm has evolved from a more idealistic and utopian conception to a more empirical one, enabling this study to be conducted better.

Mental health as subjective well-being. This paradigm belongs to a longstanding tradition within psychology and features notable contributors like Abraham Maslow and Gordon Allport. They advanced the recognition of human needs and motivations, including the concept of a “mature personality”. In recent decades, Martin Seligman has further developed the concept of “learned optimism”, building upon progress in cognitive psychology. This paradigm has evolved from a more idealistic and utopian conception to a more empirical one, which facilitates the improvement of development and study.

Mental health as socio-emotional intelligence. This idea emerged as a critique of studying intelligence as a purely cognitive function and aims to expand the concept of intelligence as the ability to act appropriately towards others and the environment. It emphasizes emotional processes as the basis for establishing good relationships with oneself, others and social organizations and institutions. This perspective has developed in the last few decades and incorporates knowledge from neuroscience. Notable

authors in the development of this paradigm include H. Gardner and D. Goleman (Gardner, 1983; Goleman, 1995).

Mental health as a process of maturation. This paradigm views life as a process with distinct stages, crises and changes. Its main contribution lies in highlighting that the criteria used to define mental health or illness should be adapted to each stage of the life cycle. Prominent authors in this perspective are Jean Piaget, considered the father of genetic epistemology, who developed important conceptualizations regarding childhood thinking phases (Piaget & Inhelder, 1969), and Erik Erikson, who systematized comprehensive theories spanning the entire lifespan across different cultures (Erikson, 1950).

Mental health as the development of resilience. The concept of resilience rose as a critique of “risk factors” and denotes the capacity to rebound and grow stronger from adverse experiences and situations (Kotliarenco et al., 1997). It represents one of the recent paradigms in this field and aspires to achieve a dialectic, integral and multidimensional perspective of the individual within their context throughout their life cycle (Grotberg, 2001). While the concept is attractive and promising, it is still in development and necessitates further empirical studies for its practical application (Davydov et al., 2010).

As previously mentioned, critical currents, particularly those favoring asylum-based psychiatry, either dismiss the notion of mental health or leverage it to emphasize its connection with the social aspects of health. This takes the concept in a socio-political direction. These currents encompass Anti-psychiatry, Social Medicine, Community Psychology and Latin American Liberation Psychology (Miranda Hiriart, 2018).

Abundant and growing evidence underscores the relationship between well-studied Social Determinants of Health (WHO, 2005) and various mental health problems (Compton & Shim, 2015). Establishing causality for complex issues is challenging, but an increasing number of studies support the idea that socioeconomic conditions can lead to mental health disorders. For instance, depression, one of the most common and relevant pathologies in this field, has been associated with poverty, social inequality, lack of social support, poor living conditions, employment conditions with high levels of work-related stress, early adverse experiences in life and gender (Alvarado & Burrone, 2018).

Conversely, Global Health and Mental Health face significant criticism from perspectives considering many of their tools as neo-colonialist. Tension between the “global” and “local” scales on which the concept of Mental Health is constructed is evident. While the contribution of Global Health development, along with progress in disease burden studies and evidence-

based medicine, to the notion of Mental Health as a global problem is recognized, there is a substantial body of knowledge, particularly from anthropology, that questions the hegemonic imposition of psychiatric knowledge. Specifically, the institutionalization of Global Mental Health is seen as a model that replicates colonial stereotypes (Bemme & D'souza, 2014).

Notably, the term “Global Mental Health” was coined by high-resource countries at the beginning of the century by drawing attention to the need to develop global tools for treating mental illnesses in low-resource countries. This movement has been primarily led by researchers and psychiatrists (Prince et al., 2007).

Both concepts, Mental Health and Global Health, have transitioned from primarily biomedical approaches to interdisciplinary ones by incorporating Anthropology and Sociology. The inclusion of indicators related to mental health and subjective well-being in measurements by multilateral organizations on social and economic development like the OECD exemplifies this evolution (Rowson et al., 2012; White & Sashidharan, 2014).

The field of action

Currently, there is significant development in the field of Global Mental Health with diverse actors involved in complex activities that make description and analysis challenging. Although those engaged in Global Mental Health are assumed to share a common understanding of its definition, there is no clear and explicit consensus on this matter (Fernando, 2012).

A recent systematic review offers a useful description and classification of how the term is considered in international literature. It identifies various categories of activities within Global Mental Health, including research to generate new knowledge to guide global policies with local involvement, implementation of therapeutic forms of care ranging from institutional to community-based models, improvement of social circumstances and contexts protecting individuals with mental disorders worldwide and priority interventions in low- and middle-income countries, aiming to move away from colonial stereotypes and encourage international collaborations (Rajabzadeh et al., 2021).

However, it is evident that the primary focus of Global Mental Health priorities, despite the wide range of epistemological options outlined, is mainly on the study of depressive disorders in low-resource countries. There is a lack of contextual and sociodemographic data that would help to better understand the phenomena (Misra et al., 2019).

Since the mid-20th century, there has been a significant shift in how healthcare is organized for individuals with mental health problems. It has transitioned from a model centered around psychiatric hospitals to one based on community services and care. Latin America has also undergone this change as part of healthcare reforms in the region (OPS, 1990). Efforts have been made to decrease psychiatric hospitals and reduce long-term stays in these facilities. Additionally, the development of new community-based initiatives, such as day hospitals, community centers and community residences, has been encouraged.

These efforts have been largely framed within the Primary Care strategy, especially in low- and middle-income countries (Caldas de Almeida & Horvitz-Lennon, 2010).

Simultaneously, in recent decades, there has been an emphasis on creating instruments that provide regulatory frameworks to support the aforementioned changes. Many countries in the region have enacted laws, regulations and/or national mental health plans, to strengthen the development of community services and ensure resources for their functioning (Agrest et al., 2018). Additionally, many of these initiatives seek to protect the human and civil rights of those with mental disorders and recognize the heavy stigma they bear. Stigma is currently considered one of the main causes of their social exclusion (Mascayano et al., 2015).

Some elements of the current context

From an epidemiological standpoint, the estimation in 2010 revealed that 7.4% of the global burden of disease, measured in disability-adjusted life years, could be attributed to mental and substance-use disorders, primarily due to the disability they induce. In absolute terms, this burden had increased by 37.6% over 20 years, which is partially attributable to population aging (Whiteford et al., 2013).

The situation in Latin America mirrors this global trend. Mental disorders, including specific neurological disorders, substance abuse and suicide, represent one-fifth of the total disease burden in the region. Major depressive disorders, as the primary cause of disability, contribute to 3.4% of the total disease burden, followed by anxiety disorders at 2.1% (OPS, 2018). Furthermore, there is a growing concern regarding the impact of mental health issues on children, exacerbated by the ongoing Covid-19 pandemic (United Nations Children's Fund (UNICEF), 2021).

In all countries, the healthcare budget allocated to mental health significantly lags in percentage terms compared to what would be expected

in view of its estimated disease burden. In Latin America, this discrepancy is at least three-fold in higher-income countries and reaches 435 times in lower-income countries, with a regional median of 34 (OPS, 2018). Despite this observation, there is a growing consensus that mental health and physical health should be understood and addressed as a unified entity and it is recognized that if one is harmed, the other will inevitably be affected. Ample evidence supports the well-known motto “There is no health without mental health” (Prince et al., 2007).

International resources from developed countries are increasingly assigned to Global Mental Health. In terms of human resource development, numerous specialized postgraduate training programs in this field, especially in Anglo-Saxon universities, already exist. As expected, these programs predominantly adhere to the prevailing paradigm from the Global North to the Global South.

On the international financial assistance side, it has been estimated that only 0.3% of the total international development aid budget for health was exclusively allocated to mental health issues between 2006 and 2016 (Liese et al., 2019). The inclusion of mental health and well-being in the Sustainable Development Goals (UN, 2015) may eventually lead to an improvement in this situation.

The Covid-19 pandemic has garnered significant attention for its effects on the mental health of populations worldwide. There have been concerted efforts to evaluate the impact of interventions in this context from various disciplinary perspectives (Holmes et al., 2020). To date, approximately 2,250 indexed scientific articles addressing the implications of this global phenomenon for Global Mental Health have been published.

Here, we highlight the utilization of previously existing international research networks, especially in Latin America, through the “The Covid-19 HEalth caRe wOrkErS (HEROES) study”, an initiative in which we have participated (Mascayano et al., 2021; OPS, 2022). HEROES is a prospective multisite cohort study aimed at “assessing the impact of the Covid-19 pandemic on the mental health of healthcare workers in 26 countries across 4 continents”. Initially designed and implemented primarily from Latin American countries, it involves the participation of a wide range of academic institutions, with support from the World Health Organization. Beyond its specific scientific purpose, we believe that its innovative approach, based on “cooperative leadership and principles of mutual learning”, aligns with an effort that contributes to “reinventing South-North collaborations and transforming the usual structures and power practices in Global Mental Health”.

Upcoming challenges for Global Mental Health

It is nearly impossible to encompass the myriad dilemmas that are likely to unfold in the coming years, but we can discuss some based on our academic experience in the field we are analyzing. For this purpose, we will divide them into those related to research, those related to human resource development and those encompassing the design and implementation of public policies.

In research, a relevant challenge is to improve certain aspects of consensus on operational definitions for research. In clinical practice, current categorical diagnoses will likely give way to multidimensional diagnoses with more flexible criteria and varying levels of cultural appropriateness. This shift will impact epidemiological studies as it will modify the classical definitions of a “case” and alter population diagnoses accordingly.

Similarly, there will be a need to incorporate innovation and development (I+D) decisively and generate general and specific knowledge. This requires resources not only for cutting-edge global innovation but also to ensure that local policies, programs and services have effective and universal coverage and, thus, reduce significant inequity gaps present within low- and middle-income countries.

Concerning the education of individuals for roles in Global Mental Health, it is imperative to adapt the curriculum, at undergraduate and postgraduate level, to incorporate a global perspective on health issues, with particular emphasis on mental health. This adjustment would enable the acknowledgment and management of factors associated with the globalization process, such as climate change, the internationalization of production processes, the influence of transnational industries and finance, the pervasive use of technology and the tensions between dominant and peripheral poles. Essentially, this aligns with the vision of scaling up the Social Determinants of Health to a global level.

Another critical change pertains to instilling psychosocial, communication and teamwork competencies in the mental health field. In the current epidemiological landscape, marked by the rise of non-communicable chronic diseases and mental health issues, coupled with significant health worker migration (referred to as “brain drain”) between countries and regions, individuals in this field need more than just the specific tools of their profession. They must cultivate strong relationships with patients and families through community engagement and recognize the undeniable cultural component that is crucial for proper implementation.

Lastly, within the realm of public policies, countries are strongly advised to advance in establishing legal frameworks that better safeguard the rights of individuals with mental disorders, their families and the wider community. This entails ensuring resources for specific mental health services, combating stigma and discrimination at all levels and promoting the mental well-being of the general population.

Addressing the latter proves challenging in operational terms, but just like strides have been made in promoting “Health in All Policies”, considerations for mental health should similarly find a place here. We are confronted with an additional challenge, involving the proposal and validation of population metrics that integrate into routine evaluations of all kinds of public policies (“mental health impact assessments”) and national periodic reports, such as the “happiness index”.

Perhaps we find ourselves at a juncture of historical change and transformation, where numerous paradigms are either ceasing to function or definitively crumbling. The evolution of the Covid-19 pandemic, various intra- and international armed conflicts and a certain degree of democratic progress in regions historically subject to totalitarian regimes all contribute to this transformative moment. It is incumbent upon students, professionals and all those engaged in the mental health field to adopt a broad perspective for their analyses, be critical and reflective in their approach to the challenges they confront and foster an attitude that encourages creativity and innovation, all while keeping sight of the ultimate goal: the well-being and quality of life of individuals and communities worldwide.

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PART IV.

SOME FACTORS OF INEQUITY IN VIEW OF GLOBAL RISKS

12. International migration and healthcare sector responses in Latin America: Challenges in training

Alex Alarcón Hein, Hellen Cisternas-Bórquez

International Context by 2022. International Migration as an Axis

The phenomenon of international migration is a highly dynamic process that depends on changes in governments and corresponding immigration policies, social, political and economic crises, internal conflicts within countries, wars, pandemics and environmental phenomena related to climate change (McCracken & Phillips, 2017).

Currently, migration worldwide continues to rise. According to figures from the International Organization for Migration (IOM) (McAuliffe & Triandafyllidou, 2022), an estimated 281 million international migrants were recorded in the world in 2020, which represents 3.6% of the global population. Of these migrants, 48% were women and 52% were men, of whom 74% were working-age individuals (20-64 years old).

Despite the ongoing global pandemic caused by Covid-19, migration for economic, social and political reasons intensifies and increases. However, we must not overlook that, prior to the current health crisis, migratory flows were already increasing and making constant progress towards integrating migrants into receiving countries. But during this crisis period this advance has been surpassed by increased migration through unauthorized border crossings, which has led to an expanding humanitarian crisis. We have seen this with the Venezuelan diaspora in Latin America but also, more recently, due to the humanitarian crisis resulting from Russia's invasion of Ukraine which has unleashed an unprecedented armed conflict in our recent history accompanied by forced displacement of entire families seeking security, stability and peace.

The current numbers of people transiting or fleeing through different areas on our planet while facing restrictions on leaving their own country can result in an exhausting, risky and insecure journey. Family and personal histories are left behind, which worsens the experiences of this journey and makes it more difficult, with uncertainties of all kinds.

In addition to economic, social and political reasons, international migration in recent years has also been associated with climate change and environmental damage. Current governance on migration, national and local policies and best practices must incorporate the importance of these environmental factors and natural disasters that affect human mobility today and in the future. They should be integrated in all areas of migration

management to emphasize prevention, preparedness, responses to forced displacement and border management labor migration and extend into the stages following integration, return and reintegration for individuals and their families.

Latin America and the Caribbean is a region that has long been known as a source of emigration to countries in the Global North. In the last decade, it has faced massive movements of people that are testing the response and coordination capacities of countries in the region. According to Andrew Selee, director of the Migration Policy Institute (MPI), “the region arrived late to the migration issue and today it resembles the rest of the world more” (Iglesias, 2021).

What changed the regional scenario was Venezuela’s political, social and economic situation, which generated this explosive increase in the massive migratory flow of its population seeking refuge. It is the largest crisis the region has experienced, comparable in size the migration from Syria, although the causes are different. In Venezuela, various factors affect the departure of its population, including a decline in quality of life, hunger, lack of medical supplies for healthcare services, street insecurity and political persecution.

Countries bordering Venezuela have received a larger part of its population; however, Chile at the south end of the continent begins to be an option because of its economic capacity and development. According to current figures, close to 50% of the migrant population that reaches Chile from Venezuela has a university degree; however, the reality for the remaining 50% of this population is very different. It is not the massive group that arrives in Colombia; it is a group with the means to cross four countries.

The International Organization for Migration points out that intraregional migration has been increasing due to disparities in labor and economic opportunities among different Latin American countries as well as people having been displaced by the internal conflict in Colombia and the deep crisis in the Bolivarian Republic of Venezuela (United Nations, 2021).

This increase is associated with media diffusion, low transportation costs and, evidently, political conditions within the region, added to the regional integration mechanisms that facilitate mobility processes. The main destination countries have been Peru, Brazil, Chile, Mexico and Argentina.

Particularly in Latin America, the increase in migration led countries to assume an active role in incorporating this issue into their political and social agendas. However, not all of them explicitly focused on precise and effective measures to incorporate the migratory flow into their health

systems. This has generally resulted in explicit policies in some countries and other countries that simply have not incorporated this international migrant population into their offer of services and healthcare provisions. Currently, few countries in the Americas region have migration and health policies. These include Chile and Colombia under development. Nonetheless, the existence of a specific policy in itself does not guarantee access and coverage for this specific population.

Healthcare systems have found themselves challenged, sometimes overwhelmed by the massive arrival of new international migrant users but also by healthcare professionals (doctors dentists nurses etc.) from different places in Latin America within a short period of time. Healthcare systems in the region are also observed as unequal both in infrastructure and equipment as well as its institutional organization where universal systems coexist with a predominance of the State's role (Brazil, Mexico, Argentina and Ecuador) and other systems with a smaller state role greater and emphasis on the private sector (Chile, Colombia and Peru). Therefore, the increase in migration affects the health system, the type of healthcare organization in each country and the healthcare human resources who receive this international migrant population.

Thus, the increase in migratory flow highlights these structural differences of each system, of its institutional cultural deficiencies and access barriers. This imposes cooperation challenges and an integration perspective with special emphasis on the role played by healthcare system like the various professions that are performed there. This article addresses the training and importance of highly prepared professionals to address this constantly increasing challenge and global concern.

Training of healthcare professionals who contribute to the well-being and right to health of international migrant and refugee populations

Migratory processes have increased worldwide and in the region, and they are here to stay. Even more so in this scenario of global uncertainty between the Covid-19 pandemic, climate change and the recent war in northern Europe, which could eventually generate new processes of human mobility.

Throughout the last decade, Latin American states have taken diverse actions in generating programs for access to social services for international migrant populations. These include facilitators of documentation processes that contribute to reducing barriers to access as well as reactive facilitators or omission. In some places, this phenomenon has been made invisible and the popular outcry has put it onto the public agenda through stigma and criminalization, thus creating a kind of competition between those at the

bottom and the second-to-last on the social scale. Undoubtedly, organized social responses generated by state actors, NGOs, civil society organizations, churches and international bodies have been key in coordinating actions for this target population.

However, institutional actions require trained personnel in this field. This challenges us to reconsider training spaces for both health professionals and humanitarian personnel to update competencies that allow an effective response to the challenges of implementing the right to health and well-being of migrant and refugee populations in Latin America.

The World Health Organization (WHO, 2021) points out that, while refugees and migrants have the same fundamental human right to enjoy the highest standard of health as all people, accessing healthcare services is often challenging for them. These services also need cultural sensitivity and effective care that recognizes and responds to their physical and mental health needs, including any harmful impact experienced during their migratory journey and considering language barriers.

The publication by Szilard et al. (2016) presents over a decade's worth of experience from Pécs University Medical School in Hungary. It highlights sudden increases in migratory flows within Europe, which has led the WHO's European Office to repeatedly call on states since 2015 and urge them to develop or strengthen their healthcare systems by making them sensitive towards providing care for arriving migrant and refugee populations. The authors note that the European education system ultimately failed to generate institutional responses.

As early as 2008, World Health Assembly Resolution WHA 61.17 called on member states to strengthen their healthcare systems to provide appropriate care for the needs of migrant and refugee populations. However, this progress was not reflected in the development of capacities among healthcare personnel. While some training initiatives were carried out with modules focusing on healthcare for migrants such as Equi-Health and MeM-T, these focused on specific aspects without developing a comprehensive approach. In this context, Pécs University Medical School is currently developing theoretical-practical study programs and research in the field of migrant population health for both undergraduate and postgraduate students.

In undergraduate studies, migration related to family medicine and occupational health is mandatory content. Optional courses cover topics such as humanitarian care and travel medicine. In postgraduate programs for healthcare professionals, a course on cultural competence in healthcare is taught. Thus, says Szilard, the health of migrant populations forms an interdisciplinary field within health sciences that requires a new type of

healthcare professional with more comprehensive knowledge and inclusive cultural management: “The variety of cultural needs within different communities and age groups must be considered in order to provide a sensitive healthcare system for them.”.

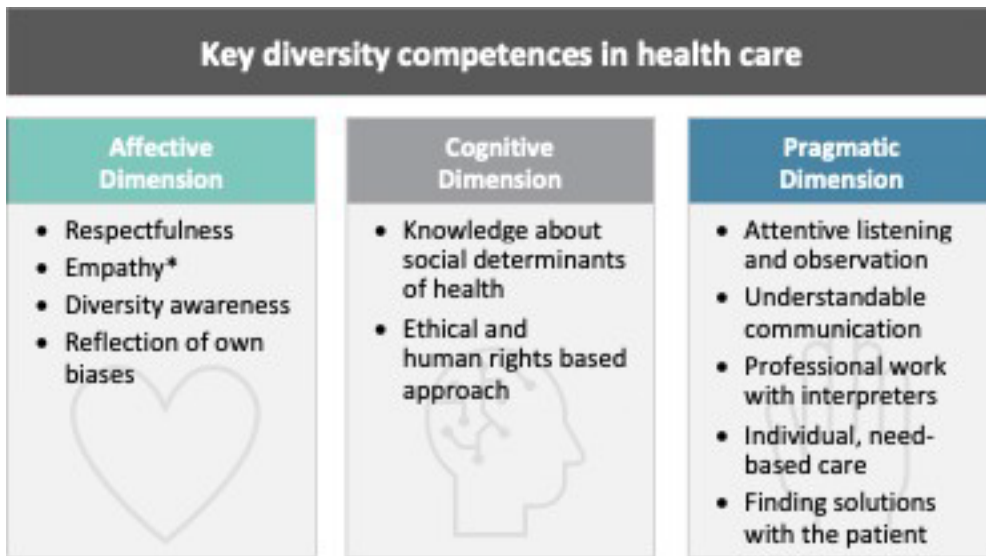
On another note, the University of Ottawa in Canada (Gruner et al., 2022) suggests that transcultural education and global migration connect various areas like human rights, social development, evidence-based medicine and access to universal health coverage. The pandemic has exacerbated social inequities. Therefore, healthcare professionals need to receive training that enables them to develop knowledge, skills and attitudes related to trauma, racism, cultural differences and language barriers along with access to health systems, tropical diseases, vaccines, chronic illnesses and global mental health.

Through mixed methods, Gruner et al. (2022) found that the curricula of Canadian medical schools included mandatory contents related to the health of migrant populations. The interviewed experts pointed out that topics such as migrant and refugee demographics, barriers to healthcare access, challenges in providing services to migrants, community settlement services, cultural competence and communication skills, preventive health screening and social determinants of health were addressed.

To go deeper into the contents of healthcare professional training, Ziegler et al. (2022) conducted a Delphi study in Europe with 31 professionals and academic experts in the field of migration and health from 13 countries.

An attempt was made to generate consensus regarding elements that contribute to a definition of competent healthcare professionals for working with diverse populations. The basic contents found were respect, empathy, self-reflection, cultural sensitivity and communicative skills as described in Figure 1.

Figure 1. Key competencies in diversity in healthcare.



Source: Translated from Ziegler et al., 2022.

They concluded that in training of healthcare personnel, the social determinants of health interconnected with diversities should be addressed, in addition to content on medical ethics and a human rights approach.

A novel contribution in this context is the publication of a document by the World Health Organization in 2021 called “Health of Migrants and Refugees: Global Competency Standards for Health Workers” (WHO, 2021). In the same year, a curriculum guide and a knowledge guide were added to contribute to operationalizing these standards.

Achieving universal coverage for this population requires strong health systems with competent health workers who have been trained, supported and empowered to provide quality care centered on migrant and refugee populations.

The purpose of generating these standards is to contribute to the training processes of healthcare workers through an outcome-based competency approach that can guide the curriculum within the healthcare field and be tailored to local needs.

The standards focus on competencies and expected behavior of healthcare workers in providing quality health services for migrant and refugee populations.

These are organized into five domains with a series of competencies and behavioral aspects within each domain. Table 1 provides a summary. For more details, please refer to the original document in English listed in the references (WHO, 2021).

Table 1. Global Competency Standards for Health Workers

Domain 1: Person-centered	
Standard Competency 1	Providing person-centered healthcare to refugees and migrants.
Standard Competency 2	Promoting agency of refugees and migrants at an individual and community level.
Domain 2: Communication	
Standard Competency 3	Engaging in safe and relevant assistance to understand the language and communication needs of refugees and migrants.
Standard Competency 4	Supporting migrants and refugees in understanding information about their healthcare.
Domain 3: Collaboration	
Standard Competency 5	Engaging in collaborative practices to promote the health of refugees and migrants.
Standard Competency 6	Responding to sudden increases in demand for migration-related services.
Domain 4: Evidence-informed practice	
Standard Competency 7	Promoting evidence-informed healthcare for refugees and migrants.
Domain 5: Personal behavior	
Standard Competency 8	Engaging in lifelong learning and reflective practice to promote the health of migrants and refugees.
Standard Competency 9	Contributing to a culture of self-care and mutual support when providing healthcare in the context of migration.

Source: Own elaboration: *Refugee and migrant health: global competency standards for health workers*. World Health Organization. Geneva, Switzerland.

For the Americas region, the 55th Directing Council of 2016 published a document on the health of migrants (PAHO, 2016). It recognizes their vulnerable situation in the region, so the PAHO generated four policy elements as recommendations for member states:

- a) Inclusive health services that respond to the health needs of migrants.
- b) Institutional arrangements to provide access to comprehensive, quality and people-centered health services.
- c) Mechanisms to offer financial protection in health.
- d) Intersectoral action and establishment of partnerships, networks and multi-country frameworks.

While point b) recommends providing comprehensive care that responds to the health needs of migrant individuals and considers cultural, religious and gender issues, it does not mention the training that healthcare personnel must have in order to achieve this desirable objective.

Likewise, in the guidance document on migration and health prepared by the PAHO in 2019 (PAHO, 2019), five strategic guidelines were generated:

1. Strengthening surveillance systems, information management and monitoring.
2. Improving access to healthcare services for migrant populations and host communities.
3. Enhancing communication and information exchange to reduce xenophobia, stigma and discrimination.
4. Strengthening partnerships, networks and multiple frameworks to understand migrant status and promote/protect their health.
5. Adapting policies, programs and legal frameworks to promote and protect migrants' health and well-being.

Strategic guideline number 2 recommends to: "Provide training for the healthcare workforce to develop interprofessional teams at primary care level with combined competencies in comprehensive care as well as intercultural approaches to health with a focus on social determinants. Training on equity in health and human rights-based approaches are key elements for both healthcare professionals as well as non-health actors."

The implementation of these recommendations from the Pan American Health Organization (PAHO, 2016; 2019), whether at planning, policy implementation or evaluation level, will require trained and sensitized personnel in the subject matter for effective performance in the desired health response.

However, the educational spaces within healthcare careers in the region are characterized by having basic training courses in biomedical sciences during the early years, followed by clinical specializations. Public health courses incorporate mentions of vulnerable populations that include references to migrant populations, but the coverage is minimal within semester-long courses in programs that span 10 to 14 semesters. Therefore, when specific healthcare competencies are required for migrant patients, internally displaced people, refugees or victims of trafficking or human trafficking, the impact is low.

At this point, the academic challenge is to increase research that can account for current training offers on this topic in Latin America. It is of greater interest to operationalize globally proposed competencies presented

by the WHO in 2021 at regional or country level as mentioned earlier.

Essential Functions of Public Health (EFPH)

From a retrospective perspective, the functions assigned to public health in the early 20th century consisted mainly of developing environmental sanitation actions, controlling communicable diseases and promoting hygiene. Over the years, these expanded to include health promotion, control of non-communicable diseases and access to primary care.

The complexity of healthcare action and its conceptual challenges led the World Health Organization in 1998 to present a list of essential public health functions. This list was created with input from various global actors who helped define competencies in public health and a framework for healthcare system reforms (WHO, 2018).

The Pan American Health Organization defines Essential Public Health Functions (EPHF) as “the capacities of health authorities at all institutional levels, together with civil society, to strengthen health systems and ensure full exercise of public health by acting on factors and social determinants that affect population health” (PAHO, 2020).

In the Americas region, EPHF was put on the agenda to strengthen the healthcare sector in the 1980s within a framework of reforms seeking to reduce the role of states and their stewardship in healthcare.

In this context, member states of the Pan American Health Organization developed a conceptual and methodological framework for public health and its essential functions. This led to a regional initiative called Public Health in the Americas that was launched in 2000. During this initiative, EPHF were extensively debated and agreed upon by diverse actors from the region. The initiative was further deepened through the document “New concepts: performance analysis and bases for action” published in 2002. It became an important milestone for developing institutional capacities and implementing healthcare improvement plans across numerous countries in the region (PAHO, 2002).

However, fifteen years later a review process began to update this horizon from year 2000 due to changes within different countries alongside challenges anticipated for the twenty-first century. This required adopting a more comprehensive approach to public health.

In 2020, the Pan American Health Organization acknowledged this era of change in its document “Essential Public Health Functions”: “The socioeconomic and political changes that have occurred since the

development of EPHF in 2002, leading to the emergence of new high-prevalence public health problems and associated costs, increasingly demand that health systems be better prepared to respond to the challenges posed by health problems and their determinants” (p.5) (PAHO, 2020).

The PAHO highlights current topics such as health equity, outbreaks of infectious diseases, population aging, mental health, non-communicable diseases, irregular and forced migration, climate change, natural disasters and access to medicines and vaccines. The need for strengthening cooperation processes between countries and supranational organizations is emphasized as it allows addressing social determinants of health within global policies. This resulted in the development of a renewed conceptual framework for Essential Public Health Functions in the Americas region (Figure 2), which has a special hallmark for expanded stewardship and governance in healthcare systems. The foundations of this renewed proposal are based on four pillars (PAHO, 2020):

- Pillar 1: Applying ethical values of public health to address inequities related to health and its causes.
- Pillar 2: Addressing social, economic, cultural and political conditions that determine population’s health.
- Pillar3: Ensuring universal access to comprehensive, integrated individual and collective public healthcare services.
- Pillar 4: Expanding the stewardship function of health authorities to address public health challenges.

Eleven essential functions have been developed that are challenging for the region’s health systems, as they urge them to assess the population’s health status and determinants of poor health, develop policies to strengthen health systems and address determinants, allocate necessary resources and ensure access to all public health interventions and services.

The Essential Public Health Functions for Latin America are:

1. Monitoring and evaluation of health and well-being, equity, social determinants of health and performance and impact of health systems.
2. Public Health Surveillance: control and management of health risks and emergencies.
3. Promotion and management of research and knowledge in the field of health.
4. Formulation and implementation of healthcare policies, promoting legislation that protects the population’s health.
5. Social participation and mobilization, including strategic actors and transparency.

6. Human resource development for health.
7. Ensuring access and rational use of quality, safe and effective essential medicines and other health technologies.
8. Efficient and equitable financing of healthcare.
9. Equitable access to comprehensive and quality health services.
10. Equitable access to interventions aimed at promoting health, reducing risk factors and encouraging healthy behaviors.
11. Management and promotion of interventions on the social determinants of health.

Figure 2. The essential functions of public health renewed



Source: OPS, 2020.

In this 2020 proposal, the role of participation of civil society and key actors in policy development is highlighted and considers them more than just implementers or recipients of health action. Another important point is intersectoral coordination that allows for a more effective approach to addressing social determinants of health.

The new Health Sector Strategies seek to strengthen health systems to respond to the current needs of the population and advance towards universal health within the framework of the United Nations Sustainable Development Goals and the Regional Strategy for Universal Access and Universal Coverage in Health.

Challenges and recommendations

This article describes the current migration phenomenon and the response process that countries in the region must have from a perspective on training healthcare human resources so they can better address migration phenomena and their impact on healthcare systems in the Americas Region.

The current scenario is complex, as global pandemic, war in Northern Europe (Russia-Ukraine), climate change, natural disasters and armed violence in the region exacerbate vulnerabilities among migrant populations including refugees, victims of trafficking and human smuggling, internally displaced persons and missing persons.

All this calls for active strategies to manage current and future crises in different countries/subregions. States must generate updated coordinated actions that allow for comprehensive timely quality responses.

In terms of migration and health, the WHO/PAHO have called for progress towards equitable universal health where healthcare is provided without discrimination based on people's needs within their communities. Detecting specific access barriers for migrant populations and defining interventions that are linguistically, culturally and financially appropriate are promoted.

This poses a great challenge for Latin American healthcare systems. These mandates come from international organizations, but specific responses not only involve developing guidelines/programs but also require human resources to have knowledge about multidimensionality that come with migratory phenomena and their impacts on health.

As described throughout this article's development, analysis studies conducted in Hungary have contributed to promoting the development of programs on migration and health; however European educational system responses have not been adequate.

Therefore, a gap is created between the health needs of the diverse people and communities that make up countries and the training processes of healthcare personnel. These minimally consider or simply lack specific training in an area that, as described above, requires a comprehensive and inclusive approach. While there are experiences in North America and Latin America, these are not systematic nor are they consistently included in curricula throughout the region.

In late 2021, the World Health Organization published a series of

papers on “Global Competency Standards for refugee and migrant health services” (WHO, 2021), to strengthen countries’ capacity to provide services to migrants and refugees. In this regard, WHO defined a range of competencies that should be incorporated into education and healthcare practices.

In light of this proposal, surveys and systematizations are to be created in Latin America for different healthcare careers that address, either transversely or specifically, the health of migrant and refugee populations. This would allow for characterizing existing offers and, ideally, projecting the strengthening of curricula in the region to include these global standard competencies proposed by WHO while also considering each country’s or subregion’s particularities.

Progress must be made in fulfilling and monitoring Essential Public Health Functions for the 21st century (PAHO/WHO, 2020), specifically number 11, by prioritizing vulnerable populations within the framework of health inequities through actions on social determinants with cultural, territorial and intersectoral relevance. International migration and its relationship with health continue to be matters of concern since it is evident that it will not stop. It is a good time for reflection but also for action; healthcare systems must be prepared for constant growth in demand for dignified, effective and quality care while promoting universal coverage without leaving anyone behind.

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13. A comprehensive look at drug policy from a global perspective

José Francisco Cumsille Garib

Introduction

For the purposes of this article, we will use the term “drugs” to refer to those substances (outside of pharmacological use) of natural or synthetic origin that have an effect on the central nervous system and can, therefore, alter and/or modify psychic and emotional activity and bodily functioning. These substances, whether legal or illegal in a particular country, can cause dependence. In accordance with this, emphasis will be placed on one of the most used legal substances like alcohol, as well as illegal drugs like marijuana (although it is currently legal in some countries), cocaine and other substances. Special mention will be given to what is happening in some countries with certain analgesic substances derived from poppies that are used pharmacologically but also diverted into an illegal market.

Although this chapter is focused on analyzing the relationship between drugs and health, other consequences surrounding the drug phenomenon that directly impact people’s health must not be overlooked.

The following sections present a conceptual framework for the drug phenomenon in the Americas, a description of indicators regarding drug consumption, challenges faced in the region and some final reflections aimed at fostering an informed debate on public policies related to these matters.

Conceptual Framework

The drug phenomenon has a long history in human civilization. It is not a new topic, however, its consequences have changed over time, mainly due to responses implemented. When we talk about the drug phenomenon globally and on our hemisphere, our first reflection is about identifying the drug problem and we ask ourselves “What is the drug problem?”. Does such a problem exist globally? This seems important for several reasons: first because we have focused policies towards substance control by dividing them into two groups - legal and illegal - thus developing differential responses accordingly. Second, and particularly concerning illegal substances, we have developed a set of common measures for countries under the assumption that they all share the same problem. However, evidence shows that the various activities associated with this phenomenon - production, trade and drug consumption - generate different types of

problems in the countries, even though their relationship presents a major concern at global level. The drug problem, although shared by all, has a different scope in each country.

This was very well described in the report “The Drug Problem in the Americas” by the Organization of American States (OAS) in 2013 (Insulza J.M., 2013), which concludes that diversity is what best reflects the drug situation globally as well as in the American region. Therefore, “the drug problem needs to be dealt with in a flexible, differentiated fashion and countries should adopt an approach tailored to the particular ways in which they are affected.”. There is no doubt that this statement made almost a decade ago remains fully relevant today.

There are two major areas of problems that have been identified in countries, which are certainly not mutually exclusive and therefore both can be present in a country: on the one hand, there are consequences associated with health and social well-being and, on the other, there are problems related to security and governance (including transnational organized crime and corruption).

These dimensions of the phenomenon have been addressed based on two main premises: policies regarding drug supply reduction, aiming to control and limit access, and policies regarding demand reduction. However, in general, funding for these policies has been primarily focused on controlling production and distribution of illicit substances based on the paradigm of the “war on drugs”, with limited funding for interventions aimed at health policies including research and evaluation.

Based on this background, we encounter major problems and challenges when considering a new approach to drug policies. The first element is the need to understand that, while there are global issues, solutions must contain a significant local component not only at national level but also at territorial level within countries. This is a political decision adequately supported by various reports.

A second issue relates to overcoming the dominant model of the “war on drugs” and moving towards policies focused on individuals (and not on substance), which, guided by solid scientific evidence, lead us towards successful interventions to reduce levels of drug consumption and achieve responsible drug use. This is crucial: policies have been “behind” drugs. However, today more and more diverse drugs are available on the market, with an increasing prominence of synthetic drugs and so-called new psychoactive substances (NPS). This comes along with a serious lack of knowledge about substance adulteration processes, as well as uncontrolled increases in the use of prescription medications, mainly synthetic opioids. Therefore, continuing with imbalanced priorities favoring drug control does

not seem to be the most appropriate path. Instead, we believe that new policies should focus on individuals and specific social sectors or groups to adopt a comprehensive and balanced approach while fully respecting human rights.

A third element, certainly very relevant, relates to the need for drug policies to consider scientific evidence as an ally (not as a threat) and prioritize a public health approach throughout their development, implementation and evaluation. It is necessary to understand the true role of evidence in decision-making processes. Public policies are ultimately interventions that have an impact on people's lives and, therefore, we have an ethical duty to minimize the risks associated with these decisions. This is precisely where scientific evidence plays its true role since it provides us with better knowledge about the reality that we are trying to modify and consequently reduces uncertainty in decision-making processes. However, it is also important to understand that scientific evidence requires specific timeframes and adequate funding which often collide with political interests and timelines. Bridges must be built between evidence and policy. They should be allies working towards achieving better public policies for the benefit of the population.

Drug use in the hemisphere (epidemiology of drug use)

One of the first elements to keep in mind when referring to the public health approach in drug policies, is having good information about the magnitude of the problem and its associated determinants. In this section, we will provide an overview of drug use and its consequences globally and, particularly, on the situation in our continent.

According to the latest World Drug Report by the United Nations Office on Drugs and Crime (UNODC) for 2022, it is estimated¹⁵ that for the year 2020, 5.6% of the global population aged between 15 and 64 reported using some substance¹⁶ in the past year (past-year prevalence), which corresponds to 284 million people within that age group. A decade earlier, for the year 2010, UNODC reported a prevalence lower than 5%, equivalent to 226 million people; therefore, there has been a 26% increase in terms of number of users (partly attributable to population growth).

¹⁵ The estimates are made based on the best available information from countries. UNODC refers to these estimates as "best estimates".

¹⁶ It refers to the use of controlled psychoactive substances for non-medical or scientific purposes. Therefore, it excludes alcohol and other legal drugs.

Regarding these previous figures, it is necessary to mention three aspects, which are described later in more detail. The first refers to great diversity in consumption magnitude among regions and subregions. The second is related to the use of cannabis, which accounts for half or more than half of mentioned figures. And third, perhaps the most relevant, is the situation regarding opioid use which currently generates a major health problem in several countries while also spreading to several others.

To better describe these two situations, Table 1 provides estimates for past-year prevalence rates (%) for three substances in 2020: cannabis (including marijuana and resin), cocaine (including cocaine hydrochloride, crack cocaine, base paste and other designations) and opioids (including opiates and pharmaceutical opioids).

Table 1. Estimation of past-year prevalence (%) for cannabis, opioids and cocaine use, population aged 15 to 64, globally and by region, 2020.

Region	Cannabis	Opioids	Cocaine
Africa	6.54	1.23	0.27
Americas	9.81	1.76	1.69
Asia	1.97	1.16	0.07
Europe	5.41	0.67	0.96
Oceania	12.00	2.44	2.7
Global	4.12	1.21	0.42

Source: Own elaboration based on data available at <https://dataunodc.un.org>.

Considering the prevalence of any substance in the last year as a reference for 2020, which is 5.6%, the first conclusion is that cannabis use (past-year prevalence of 4.1%) represents a very relevant proportion of drug use. The second fact is the great variability by region. Indeed, the estimate of past-year cannabis prevalence varies from 1.97% in Asia to 12% in Oceania. The same counts for opioid use (0.67% in Europe to 2.44% in Oceania) and cocaine use (from 0.07% in Asia to 2.7% in Oceania). For the three substances described the estimate for the American region far exceeds the global average. Is our region homogeneous? Let us first analyze the variability between subregions within the region of the Americas. According to the UNODC report, the estimate for the past-year prevalence of 9.81% for cannabis use ranges from 3% in Central America to 16.6% in North America. Something similar happens with other substances. To review drug consumption variability at a country level within our region, we will examine the Report on Drug Use in the Americas published by the Inter-American Drug Observatory (OID), Inter-American

Drug Abuse Control Commission (CICAD), Organization of American States (OAS)¹⁷. In terms of general population studies (covering ages ranging from 12 to 65 years old across most countries), based on available data at that time, past-year prevalence of marijuana use exceeded 12% in Canada (2015), Chile (2016), United States (2016) and Jamaica (2016)¹⁸, while it was below 2% in several countries mainly located in South America. In other words, the estimated prevalence in some nations of the region exceeds by six or more times its corresponding value in other countries.

Similar patterns are observed when analyzing data from school population studies, mainly among 13 to 17-year-olds. There are countries with past-year prevalence of marijuana use exceeding 20% (Antigua and Barbuda, 2013; Chile, 2015; United States, 2016), while others do not exceed 5%.

Regarding cocaine (hydrochloride), as a second noteworthy element, the heterogeneity described for marijuana remains, with lower figures of course: past-year prevalence use in the general population is equal to or higher than 2% in some countries, and below 0.5% in several others.

It is true that there may be more recent data available for some countries mentioned above in OAS/CICAD's report (for example, in Chile, the latest general population study was conducted in 2018 and for school population in 2019. The United States has recent data from both populations for 2019 and 2020, like Uruguay and other countries). However, this does not change the central point we want to emphasize, namely the heterogeneity of consumption indicators between countries, and therefore, the great diversity that exists between regions globally as well as within our own region.

The third topic that deserves special mention is opioid use, since it is causing a large number of deaths from overdose, despite its lower prevalence compared to cannabis, though higher than that described for cocaine as shown in Table 1. Opioids is a very broad category of substances including heroin and synthetic opioids (pain relievers per prescription) such as fentanyl. According to UNODC's World Drug Report 2022, and as described above in Table 1, 61 million people worldwide are estimated (past-year prevalence of 1.21%) to have used some form of opioid (opiates or synthetic opioids for pharmaceutical use) in the previous year. According to the same report, this substance use has severe consequences for health, including fatal or non-fatal overdoses, and thus, in 2019, the use of this substance

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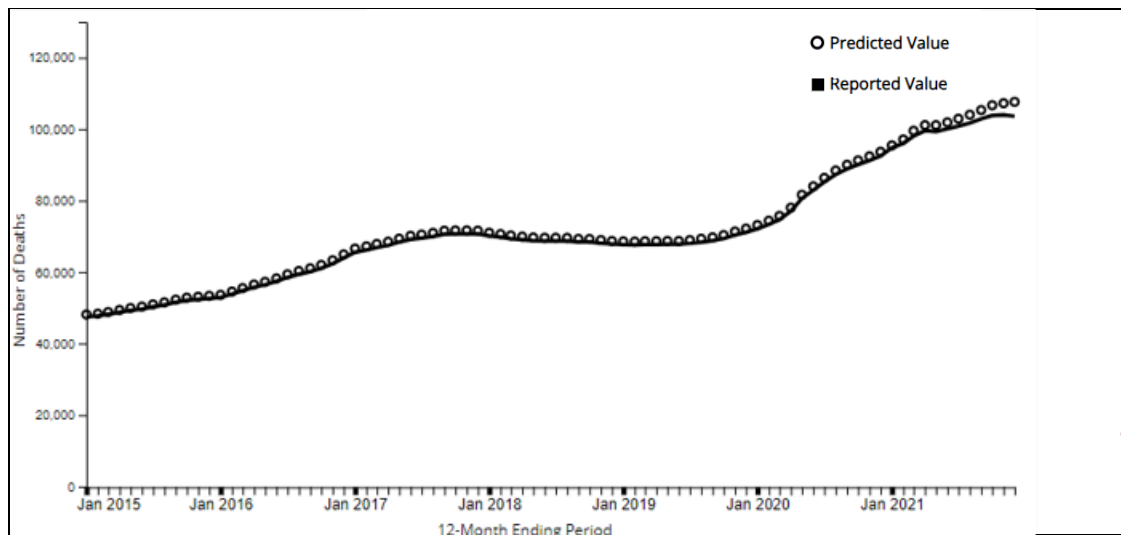
¹⁸ In parentheses is the year in which the study was conducted in the country.

accounted for approximately 71% of the total “disability-adjusted life years” lost due to drug use disorders (excluding alcohol) globally.

For European Union countries, the report “Drug-related deaths and mortality in Europe” produced by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in 2021 demonstrates that this group of countries counted over 8,300 deaths from overdose involving one or more illicit drugs in 2018. Most cases involved multiple substances. Opioids, mainly heroin and opioids used in medical treatment as a substitute for heroin such as methadone or buprenorphine accounted for 80% to 90% of all deaths with variations among countries.

In our region, according to the Centers for Disease Control and Prevention (CDC), deaths from drug overdose (excluding alcohol) in the United States were approximately 107 thousand in 2021 (Ahmad et al., 2022). In general, the trend shows an increase over time as observed in Figure 1.

Figure 1. 12 Month-ending provisional number of deaths from drug overdose: United States. (based on data available for analysis on May 1st, 2022).



Source: Ahmad, F., Cisewski, J., Rossen, L. & Sutton, P. (2022). Provisional count of deaths from drug overdose. National Center for Health Statistics.

Indeed, from 2015 to 2017, the number of deaths from overdose increased from 48,000 to 71,000 and remained stable in 2018 and 2019 at around 70,000 deaths. It then grew to over 100,000 in the year 2021; that

is an increase of 43% compared to 2019. This increase occurred during the Covid-19 pandemic. Of the total deaths in the year 2021, slightly more than 80 thousand are linked to opioids (75%) and out of these, 71 thousand are attributed to synthetic opioids (mainly fentanyl), which represents about 88% of all opioid-related deaths. In other words, deaths from overdose due to synthetic opioid analgesics use (mainly fentanyl) in the year 2021 (71,000) surpass all deaths from overdose caused by any other drug (excluding alcohol) until the year 2017 and correspond to an average of 200 deaths daily. Subsequently, a slight decline is observed towards 2022.

On the other hand, a report from the Public Health Agency of Canada (Special Advisory Committee on the Epidemic of Opioid Overdoses, 2022) reports a total of 2,829 deaths apparently related to opioid toxicity¹⁹, in 2016, a figure that increased to 7,560 in 2021 (a 167% increase compared to 2016). In 2021, 98% of the deaths were accidental and 74% were men and 26% women. The number of deaths in 2021 implies that approximately 21 people in Canada died per day due to apparent opioid-related toxicity.

Why is it important to mention this situation? As described earlier, what best identifies levels of drug use as well as types of substances used is the diversity, between regions globally and between countries within the region. This does not include other dimensions that influence the drug problem such as large-scale production and drug trafficking or micro-trafficking, which will be mentioned later. History shows us that this diversity is not static, but that it changes over time. Thus, if the use of a particular substance is not present today in a country, this does not mean that this situation will remain over time. That is precisely the lesson we must learn from current realities in some countries or groups of countries. The same can be thought regarding drug trafficking: its absence or low impact at a certain moment does not guarantee it will be a situation sustained over time.

In summary, although opioid pain relievers (fentanyl and others) are currently not present in most countries in the Americas. Where they are present, the result has been a large number of people requiring treatment and an important number of unintentional intoxication deaths. It is also important to recognize how these substances are used. A recent report from OIDA/CICAD on synthetic opioids (CICAD n. d.) states that some individuals start using these substances under medical prescription and then they fall into illicit use (Cicero et al., 2017). The report also indicates that there are signs of increasing prescription opioid use in some countries in South America and concludes with a reflection that we fully share: “If anything is to

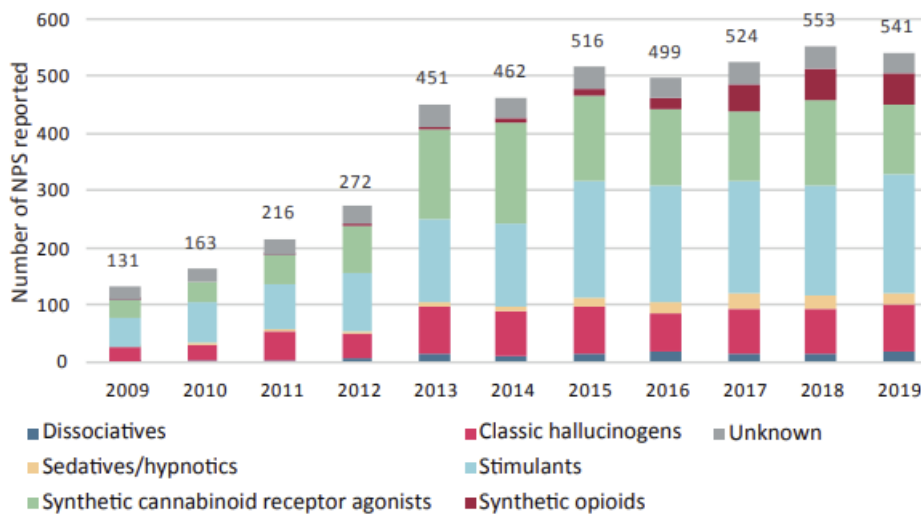
¹⁹ Deaths from apparent opioid toxicity overdose correspond to a death caused by intoxication or toxicity due to substance use, where one or more of those substances is an opioid, regardless of how the substance was obtained (through a prescription or illegally). Other substances may also be present.

be learned from the North American experience, it is that excessive supply of prescription opioid analgesics increases the likelihood of opioid use disorder and its attendant problems.”.

Certainly, this poses a great challenge for public policies, which generally tend to react to present problems rather than anticipate them. It is necessary to recognize different realities, learn from them, learn from successes and mistakes. From there early interventions can be generated to minimize potential impacts of new scenarios. These interventions should not only focus on substances themselves but rather on individuals by developing appropriate protective measures. Research plays a fundamental role in generating suitable knowledge for this purpose. This requires a change in policy priorities and their financing.

In addition to the above, it is necessary to add the emergence of the so-called New Psychoactive Substances (NPS), which are substances that are not subject to control or prohibition and produce effects like those controlled by international conventions. The responses to this new threat have been diverse, the most relevant being the creation of global and regional instances that allow for continuous generation of information about this phenomenon, as well as capacity building for human resources in countries. On the one hand, the United Nations Office on Drugs and Crime creates the Global Synthetic Drugs Monitoring Program: Analysis, Reports and Trends (SMART), in Europe, under the administration of the European Monitoring Centre for Drugs and Drug Addiction, an Early Warning System for NPS is generated. More recently, the Early Warning System for the Americas (SATA) was created within ODA/CICAD/OAS. All these efforts are aimed at generating early information that allows for a more effective response while reducing risks associated with using these types of substances. For the April 2021 report from the SMART program (UNODC 2021a), Figure 2 describes worldwide trends regarding NPS appearance.

Figure 2. Number of individual NPS reported by effect group at global level, 2009-2019.



Source: UNODC, *Early Warning Advisory on NPS, 2021*.

As observed, since 2015, over 500 NPS have been detected per year, classified according to the pharmacological effect they produce. Most of these substances are stimulants and agonists of synthetic cannabinoid receptors. Considering the number of NPS in 2019, it can be affirmed that an average of 10 new substances is detected worldwide every week. This has generated great concern globally and in countries individually as it represents a new aspect of drug-related issues.

To conclude this section on substance use and its consequences, let us refer again to the UNODC Report (UNODC, 2022) which estimates that in the year 2020, approximately 284 million people used drugs the year before according to studies conducted in various countries. Around 38.6 million of them experienced some form of substance use disorder. According to the same report and referencing the Global Burden of Disease Study from 2019 (Puchner et al., 2019) (Institute for Health Metrics and Evaluation), approximately **494,000 deaths were estimated to have attributed to drug use** globally. Additionally, an estimated total of **128 thousand deaths were attributable to drug use disorders** (excluding alcohol). Table 2 presents the distribution of these deaths by drugs and regions considering only Europe and America.

Table 2: Distribution of deaths attributed to drug use disorders by substance and selected regions, 2019.

Region	Substance				
	All	Opioids	Cocaine	Amphetamines	Others
Europe*	20,328	15,753	799	994	2,782
America*	71,204	49,853	10,161	4,737	6,452
North America**	68,246	49,205	8,648	4,583	5,809
Lat. Am. and Caribbean	2,854	560	1,522	152	621
Global	128,082	88,353	12,779	8,964	17,986

* According to the classification of the World Health Organization.

** United States and Canada. Excludes Mexico, which is included in Latin America.

Source: Own elaboration based on the Global Burden of Disease Study GBD 2019.

Table 2 shows that a significant proportion of deaths attributed to substance use disorders correspond to the America region (55.6%), specifically related to opioid use (69%). In North America, the highest proportion of deaths is explained by opioid use (72%), while in the subregion of Latin America and the Caribbean, it is cocaine use (53%). This reinforces the previously mentioned fact about the diversity regarding drug use and its consequences at global and regional level. It is important to note that these figures are absolute values, not adjusted for corresponding population sizes.

As mentioned at the beginning of this document, one of the most widely used substances is alcohol, which is also associated with many pathologies and accounts for a significant proportion of deaths as well as Disability-Adjusted Life Years (DALYs). According to a report from 2018 by the World Health Organization, globally in 2016, 2.3 billion people (aged 15 and older) were alcohol consumers, equivalent to a past-year prevalence of alcohol use of 43%. Three WHO regions had a prevalence rate exceeding 50%, including the Americas region.

Among adolescents between 15 and 19 years old, global prevalence was reported at 26.5%, with Europe having higher prevalence rates within this age group at approximately 43.8%, followed by the Americas region with around 38.2%. According to the Pan American Health Organization's Report from 2021 (PAHO), in 2016, the past-year prevalence of alcohol use among the population aged 15 and older in the Americas region was 56.7% (69.8%

among men and 44.3% among women), and the prevalence of binge drinking reached 23.4% of the total population (38.1% among men and 9.4% among women), which is equivalent to 41.2% of current drinkers. Finally, people with alcohol use disorders represent 9.2% of the general population aged 15 and older, 16.2% of current drinkers and 39.4% of binge drinkers. The above indicators show significant variability between countries within the region: higher values were found in the United States, Uruguay, Chile, Argentina and Canada and lower values in Nicaragua, El Salvador, Honduras and Guatemala.

The Report on Drug Use in the Americas (2019) by CICAD/OAS presents indicators on alcohol use among school-aged populations (typically aged 13-17 years old). Past-month prevalence use exceeds 30% in several countries (e.g., Argentina, Colombia, Saint Vincent and the Grenadines and Saint Lucia). However, the most striking, and alarming, aspect is high consumption among eighth-grade students (approximately 13 years old), where the past-month prevalence of alcohol use exceeds 25% in six countries in the region that have available information. This value rapidly increases towards higher grades, reaching levels above 50% in twelfth grade in several countries within the region. Another element identified by the report is the virtually null difference in the past-month prevalence of alcohol consumption between men and women. It also provides an overview of harmful alcohol use among school-aged populations (an even more concerning issue), concluding that “in 16 out of 20 countries with this indicator, a least one out of two students who drank alcohol in the past month reported harmful consumption”, again without differences between men and women.

The preceding paragraphs gave a general and quite summarized overview regarding some indicators that measure the magnitude of alcohol use. Next we will analyze some consequences associated with use, particularly mortality and Disability-Adjusted Life Years (DALYs)²⁰. According to the WHO report referenced above, for the year 2016, globally, harmful alcohol use of alcohol is estimated to have accounted for approximately 3 million deaths (2.3 million among men and 0.7 million among women), which represents 5.3% of all deaths and nearly 133 million DALYs (5.1% of the total). Mortality as a consequence of alcohol use is higher than that caused by diseases such as tuberculosis, HIV/AIDS and diabetes. The report also states that younger populations are disproportionately affected by alcohol use compared to older individuals, where 13.5% of deaths in people aged between 20 and 39 years old is attributable to alcohol use.

²⁰ Years of life lost due to premature death plus years lost due to disability due to alcohol use.

The global mortality rate attributable to alcohol use was 38.8 per 100,000 people during the year 2016, with significant regional variations: in Africa, the (age-adjusted) mortality rate reached 70.6 per 100,000 people, followed by Europe with 62.8 per 100,000 people; in the Americas region, the rate was below the global average at a value of 34.1 per 100,000 people.

In the Americas region, the report from the PAHO attributes around 380 thousand deaths to alcohol in 2016 and accounts for 6.7% of disability-adjusted life years. The main causes of death attributable to alcohol are digestive disorders (almost 96 thousand), malignant neoplasms (61.7 thousand), self-harm and interpersonal violence (58.6 thousand) and traffic injuries (52.6 thousand). Additionally, about 32 thousand deaths were attributable to alcohol use disorders. Of total deaths, 84.6% correspond to men.

The report also indicates that mortality rates attributable to alcohol use vary greatly between countries in the region.

The indicators associated with substance use as well as its consequences presented in this section show a quite complex panorama, regardless of whether these substances are legal or illegal; therefore it remains a major challenge for public policies across countries. As is true for all matters, there have been advances and setbacks. A good example of progress at a global level is tobacco, where prevalence and incidence indicators have been declining over recent years.

But besides the above, there are other issues that must be addressed within a comprehensive drug policy. In fact, when referring to illegal substances the consequences associated with an illicit market are to be taken into consideration; that is, all those activities related to production and marketing of those products including drug trafficking (which will be discussed later). Elements that make up the trade of an illegal product are obviously not present when it comes to legal substances. For example, the production and commercialization of tobacco or alcohol do not generate the same negative consequences as the production and commercialization of cocaine or marijuana, or in general any substance subject to control. This can be a central element that must be considered when discussing new strategies associated with drug policies.

There is still something else: an inherent health risk of the use of drugs obtained from the illegal market is the lack of quality control, when contents are unpredictable. This likely generates inequality in risks because “quality” can be associated with price and, therefore, with access opportunities. The adulteration of drugs, i.e., adding other substances besides the expected ones, is part of the illegal business. When someone buys an ecstasy pill, do they really know what that pill contains? Or when

they buy a dose of base paste? In practice, under the same name for an illegal substance, there are multiple options for that substance. For example, base paste without caffeine, base paste with low percentage of caffeine, base paste with high percentage of caffeine. But since caffeine is not the only adulterant used, we can imagine different combinations of drugs sold under one name - in this case, base paste - and these combinations can certainly be associated with different health risks for users, that are unknown to them. Adulterants are substances that have effects similar to the drug itself. Diluents are also added; these are mainly (but not exclusively) added to increase the volume. We will focus on adulterants here. There are several examples in the region: first and foremost we can mention a systematic review on this topic published by OI/CICAD in 2019: Drug Adulterants and Their Effects on the Health of Users: A Critical Review (CICAD 2019a). This publication provides information about main adulterants used in different illicit substances. For instance, cocaine (hydrochloride and base), ecstasy and heroin frequently contain caffeine, fenacetin and local anesthetics (such as benzocaine, lidocaine and procaine) as adulterants; levamisole is used as an adulterant in cocaine and heroin production; fentanyl and its derivatives are used as adulterants in cocaine, heroin and LSD. In Canada, a cross-sectional survey and urine analysis study found that among those who tested positive for fentanyl or analogues (in urine), 36% in British Columbia and over 90% in Montreal did not report having consumed fentanyl (in the survey), which suggests unintentional use or unknown exposure to this drug. As mentioned earlier, one of the main adulterants is caffeine and it is important to highlight studies by Galvalisi et al. (2016) and Schwarzkopf et al. (2018) that analyzed the effect of caffeine as an adulterant in cocaine base paste and its impact on the pulmonary inhalation route, which demonstrates its additive stimulating effect with the active ingredient; i.e., caffeine increases the stimulant and addictive effects of cocaine.

The above is just a brief summary associated with the problem of adulterants in illicit substance production. The adulteration of psychoactive substances is a fact; it exists and is inherent to the distribution and commercialization process of illicit substances, which can have very negative consequences for consumer health. Methodological and technical aspects are to be studied to analyze the characterization of substances circulating in the market - these should be standardized to produce systematic information so that users of illegal substances can be informed about their health risks. Transferring this information to consumers is essential so they are aware of (currently unknown) damage caused by these substances, allowing them to make an informed - or at least less arbitrary - decision on whether or not to consume a particular substance. However, it is also important to note that unfortunately, this aspect of illegal substances is rarely discussed. It is overlooked and discussions about drugs continue as if each one were a homogeneous substance with uniform and known

consequences. Reality proves otherwise and, therefore, if there was truly genuine concern about the health impacts associated with drug use, the adulteration of these substances must be a relevant variable in the equation which cannot continue to be ignored and left aside during discussions about illegal drugs.

Drugs and security

What has been presented so far is just one aspect of the drug phenomenon. Another relevant dimension is what has been called “drugs and security”; i.e., all the negative consequences associated with production and commercialization of drugs in an environment of illegality. In this context, it seems important to highlight what the report titled “The Drug Problem in the Americas” by the Organization of American States in 2013 states: “History is replete with examples illustrating that whenever there exist goods and services for which there is a demand in a given society, there will be incentives to develop economic activities satisfying that demand”. It further adds: “When associated with a prohibition, that economic activity automatically qualifies as illegal and, equally automatically, its practice is a crime and, at almost all stages, is classified as organized crime”.

Since the demand for illegal drugs has been increasing along with the growing diversity of available illegal drugs resulting in inevitable growth of illicit markets in most countries, these two statements from the OAS report are today more relevant than ever and force us to deeply reflect on what is happening on the illicit drug market and how countries have responded to these new realities.

Regarding this market, the same OAS report explains: “those markets are not governed by regulations or socially imposed standards, nor are they open to regular competitive processes. Consequently, the rules and regulations governing production and trade are those imposed by the criminals themselves and the only “competition” to ensure that the business prospers and expands is violence”.

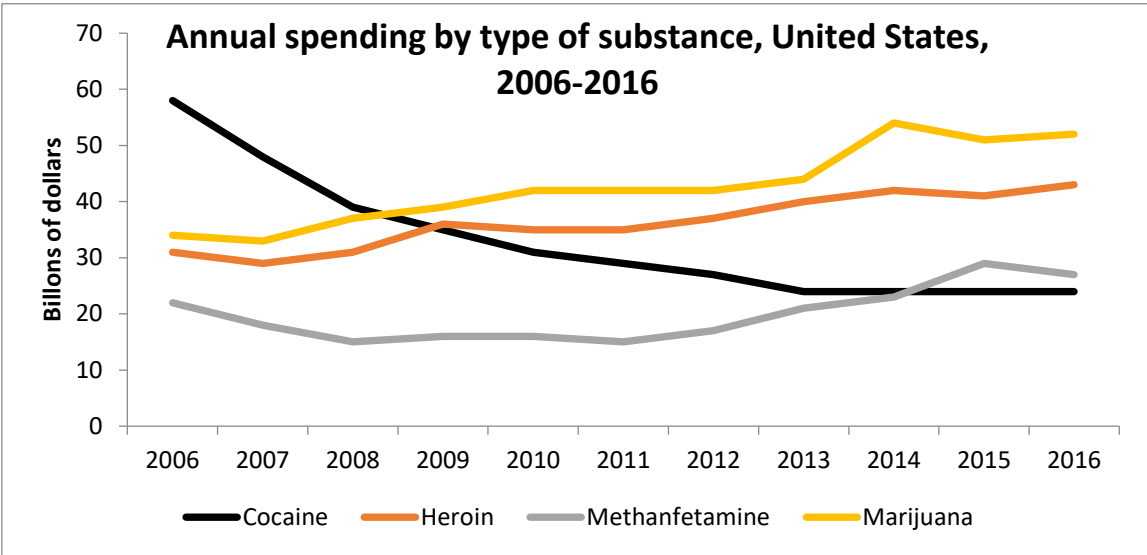
Hence, negative effects associated with illicit drug markets can vary greatly. For example, they give life to transnational organized crime groups while generating increased neighborhood violence at a significant cost in human lives. This includes those lost in the contexts of the ‘war on drugs’ as well as those that occur between rival gangs fighting over territories, along with innocent victims affected by these phenomena. Additionally, corruption must be added into consideration. According to the OAS report: “The evidence shows that the illicit drug problem had led, chiefly at the production and transit stages, to the corruption of government officials at

various levels.”. It further adds that “One finding that everybody agrees on, with respect to the illegal drugs economy, is that this and organized crime cannot survive without corruption.”.

Equally important are the costs that states must face in controlling the production and commercialization of illicit drugs. In many countries, these expenses detract from investments in other needs such as health and education. These amounts include those allocated to police activities, the justice system and penitentiary systems. For example, a recent publication by the Global Commission on Drug Policy states the following: “Drug control policy has an annual cost of 100 billion dollars concentrated in law enforcement and militarization of responses to drug trafficking. The illegal market has an estimated value of 500 billion dollars which is controlled by transnational organized crime outside any financial scrutiny.”.

In the United States, according to a report published in 2011 by the Department of Justice (National Drug Intelligence Center), in 2007, direct and indirect costs attributed to illicit drugs amounted to USD 193 billion, mainly within the Criminal Justice System (USD 56 billion) and incarceration (USD 48 billion). Furthermore, Midgette et al. provide estimates for user spending on four specific drugs in the United States from 2006 to 2016. Figure 3 summarizes the findings presented in their report where total spending for these four substances exceeds USD 140 billion for each of the last three years analyzed, but also shows significant changes over time such as a reduction in cocaine spending by less than half while marijuana and heroin spending increased between 2006-2016.

Figure 3: Annual Spending per Substance Type - United States - 2006-2016



Source: Own elaboration on the information available in the RAND report, in Midgette et al.

The information from a country (such as the United States, with high demand due to high prevalence and population) can illustrate the real magnitude the illicit drug market can have worldwide and, therefore, it is relevant to analyze this situation in order to better understand phenomena associated with drug trafficking, but mainly to discuss possible medium- and long-term solutions.

Everything described so far occurs within the context of current drug policies, which have prioritized the persecution of drugs and related crimes and leave an extremely lucrative business in the hands of transnational organized crime and numerous groups dedicated to drug trafficking at different scales in our countries, with the aforementioned consequences. This does not mean that a paradigm shift in drug policies will immediately and fundamentally solve organized crime, but States have the obligation to react in some way to address current problems. It is never too late for reflection, evaluation, proposing and rectifying, if necessary, by analyzing costs and benefits of different options but always based on the best available evidence.

New regulations on drug policies

There have been some changes, there is not a doubt about it; for example, changes in legislation regarding decriminalization of drug use in several countries as well as possession of doses for personal use; furthermore, therapeutic use of cannabis has been allowed in several countries along with scientific research into its potential benefits. The most recent development is marijuana legalization for recreational purposes, i.e., legally permitting its production and commercialization.

In this section we will analyze some effects resulting from these changes, particularly their impact on consumption. The first situation we review is Europe where, at some point, different countries made changes regarding penalties for offenses related to cannabis use, mainly crimes for possession of this substance. Some countries tightened penalties while others reduced them. In 2011, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) analyzed the impact of these changes and then, in 2018, Hughes et al. updated this information. The hypothesis was that tightening criminal sanctions should lead to decreased prevalence of cannabis use, whereas those countries that reduced penalties should experience an increase in consumption. In their publication, Hughes et al. analyzed a 10-year follow-up period for each country (mainly 5 years before and 5 years after the corresponding legislative change), as illustrated in Figure 4. The solid lines represent countries where penalties were reduced,

while the dashed lines represent countries where sanctions were increased. Simply put, visually there is no evidence of a change in the expected direction in either situation, which leads the authors to conclude that moderate changes in laws regarding cannabis use are not necessarily associated with changes in prevalence of cannabis use.

Figure 4: Trend in past-year prevalence of cannabis use among individuals aged 15-34 before and after penal change.

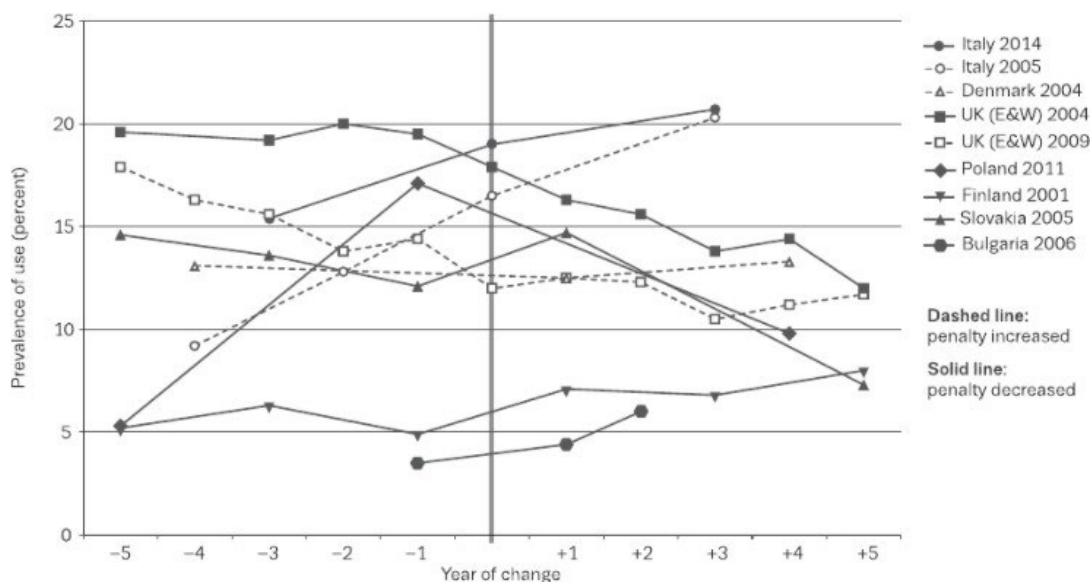


Figure 1 Trend in last-year prevalence of cannabis use, ages 15–34, pre–post penalty change

Source: Hughes, B., Matias, J. & Griffiths, P. (2018). Inconsistencies in the assumptions linking punitive sanctions and use of cannabis and new psychoactive substances in Europe. *Addiction*, 113(12), 2155-2157

A second legislative change is related to the approval of laws on use of cannabis for therapeutic purposes. This situation generated a hypothesis in the sense that the discussion and approval of laws on therapeutic use of cannabis would decrease the perception of risk and have an impact on increased consumption. To analyze this, we will look at the United States, where this legislation has been more widespread. The article by Devora S. Hasin et al., published in *The Lancet/Psychiatry* in 2015 (Hasin et al., 2015), analyzes this situation using past-month prevalence of marijuana use as an indicator, obtained from studies conducted under the Monitoring the Future (MTF) program (National Institutes of Health, 2021). This is an annual survey conducted since 1975 among students in grades 8th, 10th and 12th in the United States; i.e., ages ranging from 13 to 14, 15 to 16 and 17 to 18 years old (modal values for each grade level). The publication considered studies from 1991 to 2014 with a total accumulated sample size of 1,089,270 students.

At some point during this period, 21 states had passed a law allowing therapeutic use of cannabis. An analysis was carried out with a division into two groups: one group consisting of all studies conducted in states before passing the law on therapeutic use of cannabis and another group consisting of studies conducted after approval of the law. The results are presented in Table 3:

Tabla 3. Table 3: Adolescent marijuana use in 48 contiguous US states between 1991 and 2014.

	Adjusted Prevalence		Adjusted Odds Ratio	p-value
	Before Law	After Law		
All grades*	16.25%	15.45%	0.92 (0.82-1.04)	0.185
8th grade	8.14%	6.05%	0.73 (0.63-0.84)	< 0.0001
10th grade	17.94%	18.27%	1.02 (0.90-1.11)	0.738
12th grade	22.68%	22.02%	0.96 (0.84-1.10)	0.581

Source: Hasin, D. S., Wall, M., Keyes, K. M., Cerdá, M., Schulenberg, J., O'Malley, P. M., Galea, S., Pacula, R., Feng, T. (2015). Medical marijuana laws and adolescent marijuana use in the USA from 1991 to 2014: Results from annual, repeated cross-sectional surveys. *The Lancet Psychiatry*. [https://doi.org/10.1016/S2215-0366\(15\)00217-5](https://doi.org/10.1016/S2215-0366(15)00217-5).

As observed, the prevalence of marijuana use globally – combining all three grades – before approving the law was 16.25% and this decreased (not significantly) to 15.45%. However, a statistically significant decrease is observed among eighth-grade students (from 8.14% to 6.05%). There are no significant changes in the other two grades. In summary, legislative changes regarding therapeutic use of cannabis are not associated with an increase in recreational marijuana use among the studied population.

A third situation relates to new regulatory frameworks regarding the production and commercialization of marijuana for recreational use. Legalization in this direction has occurred only in two countries, Uruguay

in 2013 and Canada in 2018, but several states within the United States had already advanced with local legislation and others have approved them subsequently. So, by the end of 2021, a total of 17 states plus the District of Columbia have legalized recreational marijuana use (in more recent cases, the law has not yet been implemented). At a federal level, it remains an illicit substance.

The new regulatory frameworks in these territories share a fundamental aspect, namely, the legalization, but each one has particularities that can make them very different. For example, in Uruguay there is strong state regulation that controls the type of substance produced (two varieties with a maximum THC content of 9% and a minimum CBD content of 3%) and controls the sale price. In addition, users must be registered in one of the three available options (self-cultivation, club registration or pharmacy registration), the minimum age to access is 18 and a maximum of 40 grams per month can be acquired (10 grams per week). This does not occur in US states, where a much freer market generally operates – retail prices are set by the market – and people aged 21 or older can access marijuana without requiring registration. The 2021 UNODC report (UNODC, 2021b) (Booklet 3, pages 32 and onwards) provides a detailed comparative description of different aspects of laws in each territorial space. It can be observed that there is no single regulatory model, but rather a diversity of them.

These new regulations have not been exempt from controversy; they have supporters and detractors with varied arguments in each case. But the current regulatory model has also been under discussion for quite some time. While many arguments are rooted in ideological issues, below we will review some aspects observed as a result of implementing new approaches to recreational marijuana use. One argument against changes in current policy has focused on the fact that marijuana is harmful to health and that its legalization would create an opposite perception among the population, which would result in further decreased risk perception and therefore greater consumption. First, it is important to reiterate that drugs, all drugs, are harmful to health, not because they are legal or illegal, but because they are drugs according to the definition provided by the World Health Organization. For this reason, this argument is irrelevant when discussing drug legalization. Second, marijuana use has not necessarily gone up and even changes could be similar to those shown by countries where it has not been legalized.

What do the results show about marijuana consumption in territories where it has been legalized? In Canada, the law was implemented in October 2018 and to evaluate the impact of cannabis legalization and regulation, the Department of Health (Health Canada) implemented a cannabis survey system among individuals aged 16 and older (Canadian Cannabis Survey).

Since 2018, four studies have been conducted: 2018, 2019, 2020 and 2021. The main results (Government of Canada, 2021) show a significant increase in the past-year prevalence of cannabis use from 25% to 27% between 2019 and 2020, with a significant decrease to 25% in 2021. While there was a significant increase in the segment aged between 16 and 19 years old from 2018 to 2019 (36% to 44%), the study in 2021 showed a prevalence of 37% in this group (similar to 2018), with a significant decrease compared to 2020. Furthermore, in 2021, 26% of Canadians who used cannabis in the past year reported using it daily or almost daily, no change from previous studies. The average age of initiation of cannabis use increased from 18.9 in 2018 to 20.4 years old in 2021. Another interesting result is that for 53% of those who reported using marijuana in the past year in Canada, their usual source of access was a legal store, in contrast to 41% in 2020 and 24% in 2019. In addition, 11% (13% in 2020) indicated that their usual purchasing channel is a legal online source. Lastly, among past-year users, there has been a decrease in the proportion of those who reported driving a vehicle after using cannabis: from 27% in 2018 to 16% in 2021.

Uruguay approved the law in 2013 and in August 2014, registration for self-cultivation began (13,441 registered individuals as of December 31st, 2021). In October of that same year, registration for cannabis clubs started (7,032 registered individuals as of December 31st, 2021), and in May 2017, the registration for pharmacy sales began (47,515 registered individuals as of December 31st, 2021) (IRCCA, 2022). In terms of the magnitude of indicators on cannabis use, the report from the latest secondary school population study (Junta Nacional de Drogas, 2020b) shows an increasing trend in past-year prevalence of marijuana use between 2011 and 2014 from 12% to 15.5%. It then increased to 19.8% in 2016 and it remained at 19.7% in 2018. In the historical series from 2003 to 2016, the past-year prevalence of marijuana use among that population was higher in males than females, with a significant difference in 2011, with 14.8% among male students and 9.6% among female students. From that year on, the differences decrease and reach equal figures in the study of 2018 at 19.7%. At the same time, the report from the general population study aged 15 to 65 years in 2018 (Junta Nacional de Drogas, 2020a) shows that the past-year prevalence of marijuana use increased from 1.4% in 2001 to 8.3% in 2011, then rose to 9.3% in 2014 and to 14.6% in the last study in 2018. When comparing the results of 2018 with 2016 (Junta Nacional de Drogas, 2016) by age group, the smallest increase in past-year prevalence of marijuana use is observed in the 15 to 18-year-old group, from 14.8% to 19.1%, which represents a growth of 29%.

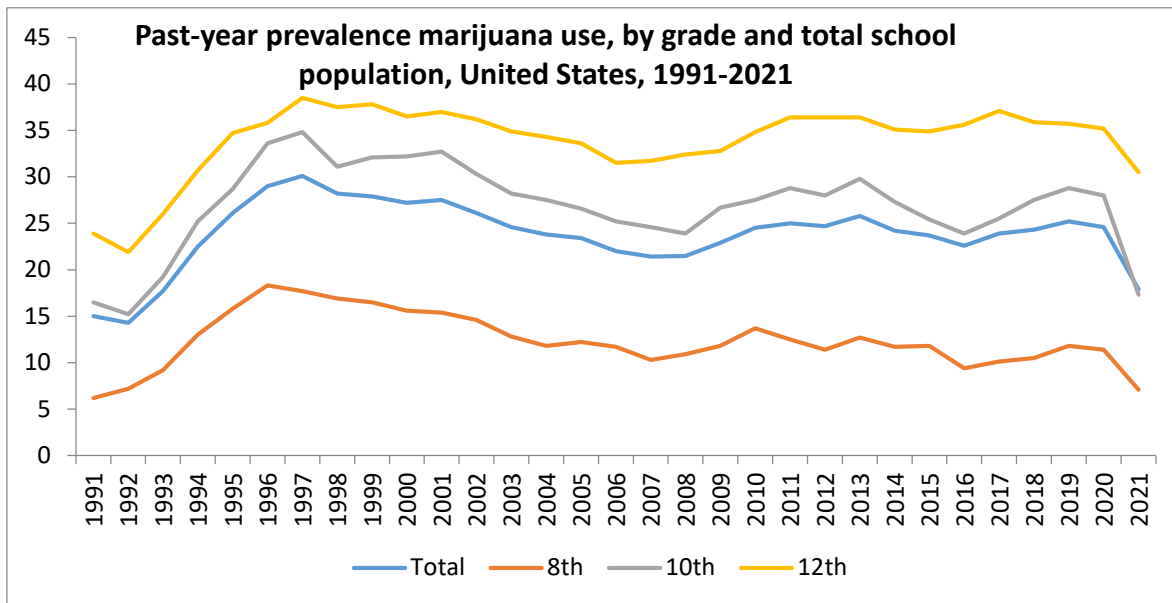
Another result of the general population study in 2018 is that among last-year marijuana users, legal access reached 27.3% of users, i.e., a significant number of users who at that time resorted to some form of

informal market. However, this market has different faces, not just drug trafficking. In fact, 35.7% declared that their most frequent access to cannabis was what is known as “national illegal access”, which includes “unregistered self-cultivators”, or those who “bought from someone who self-cultivates or is a member of a club” or “someone who bought for me from a self-cultivator or club member” and mainly those who reported having “shared unregistered homegrown buds”. The study conducted in 2014 demonstrated that classic drug trafficking (direct or indirect contact with drug trafficking) was the main source of access, estimated at 58.2% of users utilizing this source, which decreased to 11.6% in 2018 (Junta Nacional de Drogas & Observatorio Uruguayo de Drogas, 2019). The field work for this study was conducted between September and December 2018 and by then, according to the Institute for Regulation and Control of Cannabis (IRCCA, 2022), there were 43,694 people registered to legally access cannabis through any of the three alternatives provided by law. This figure increased to 67,998 by December 2021. This represented an increase of 56% over a three-year period.

This would imply that there is a dynamic process with still room for an increase in Uruguay’s regulated cannabis market.

Finally, trends on marijuana consumption are presented below for both national level and states where it has been legalized for recreational use in the United States. In the case of studies in school-aged population (eighth, tenth and twelfth grades), Figure 5 presents the trends in past-year marijuana use at national level and by grade from 1991 to 2021, based on information from the Monitoring The Future report. Both globally and for each grade, 2001 shows a statistically significant decrease in prevalence compared to 2020.

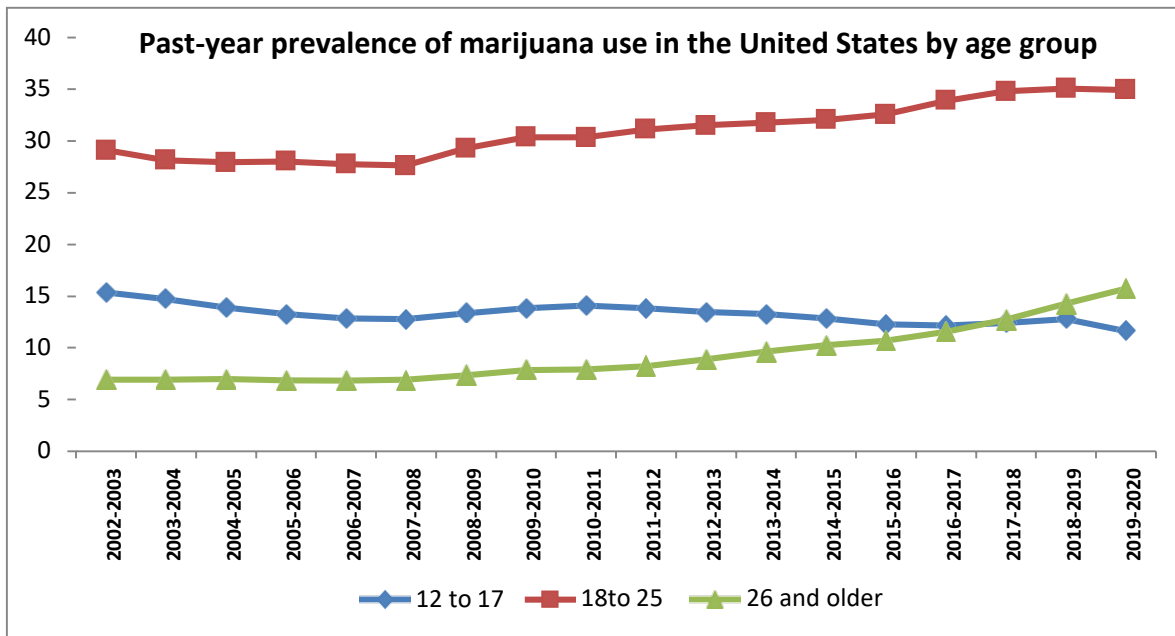
Figure 5. Past-year prevalence of marijuana use by grade and total. School-aged population, United States, 1991-2021.



Source: Own elaboration based on National Institutes of Health. (2021). Monitoring the Future. Trends & Statistics.

For studies in the general population aged 12 and older, Figure 6 shows the trend in the past-year marijuana use by age groups (Substance Abuse & Mental Health Data Archive, n.d.). Between 2002 and 2007, a stabilization is observed in the age groups of 18 to 25 and 26 and older, followed by a systematic increase. However, a stabilization and even a decrease are observed in the group aged 12 to 17 towards the last years of the series. Moreover, until the combined indicator for 2016-2017, the prevalence in this group was higher than the group of 26 years and older. Nonetheless, since then, the situation has reversed and in recent studies it is even lower than that age group.

Figure 6. Past-year prevalence of marijuana use in the United States by age group.



Source: Substance Abuse & Mental Health Data Archive. (n. d.). Interactive NSDUH State Estimates. Retrieved from <https://pdas.samhsa.gov/saes/state>.

It is important to look at national data before focusing on states where marijuana has been legalized for recreational purposes, since in many cases the national situation is replicated, as shown below. The states of Colorado and Washington were the first to legalize recreational marijuana use. In both cases, the corresponding laws were passed in 2012 and retail sales began around 2014. Figures 6 and 7 show the trends in past-year prevalence of marijuana use in Colorado and Washington. In both cases, no major changes can be observed in the trend among individuals aged 12 to 17 until the combined data for 2013-2014, followed by a slight decrease. In the higher consumption age group of 18 to 25, a mild but steady increase can be seen until 2016-2017 in Colorado, followed by a stabilization. In contrast, in Washington, a stabilization is observed until 2014-2015 and then an increase. Similarly, in the age group above 26, since 2015, the level of consumption has exceeded that of the 12 to 17-year-old population.

Figure 7. Past-year prevalence of marijuana use in Colorado by age group.

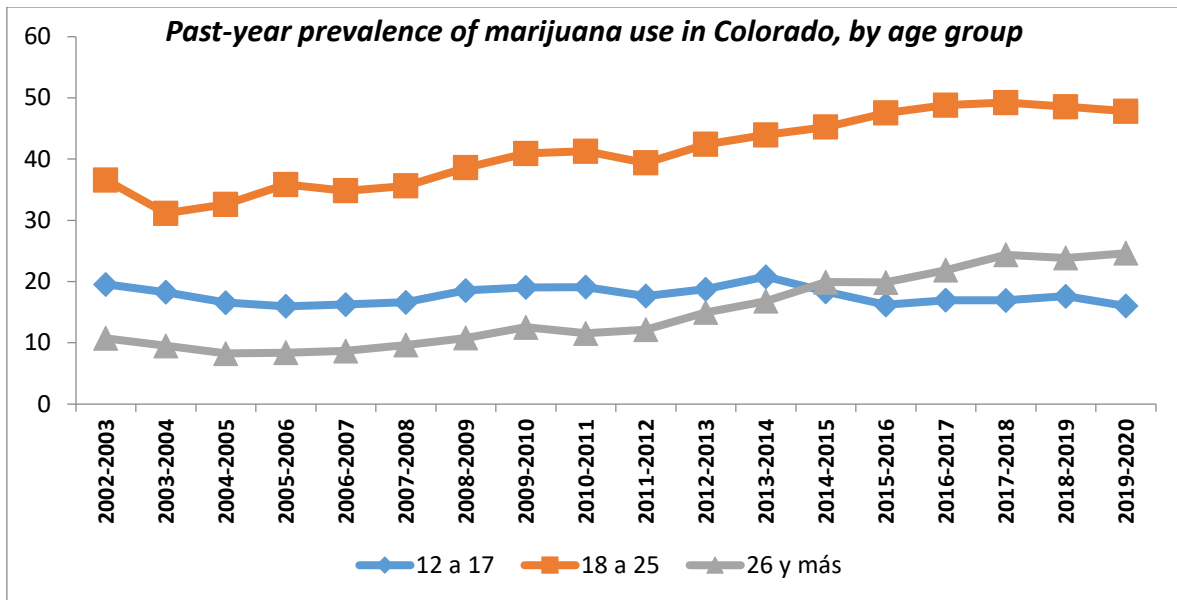
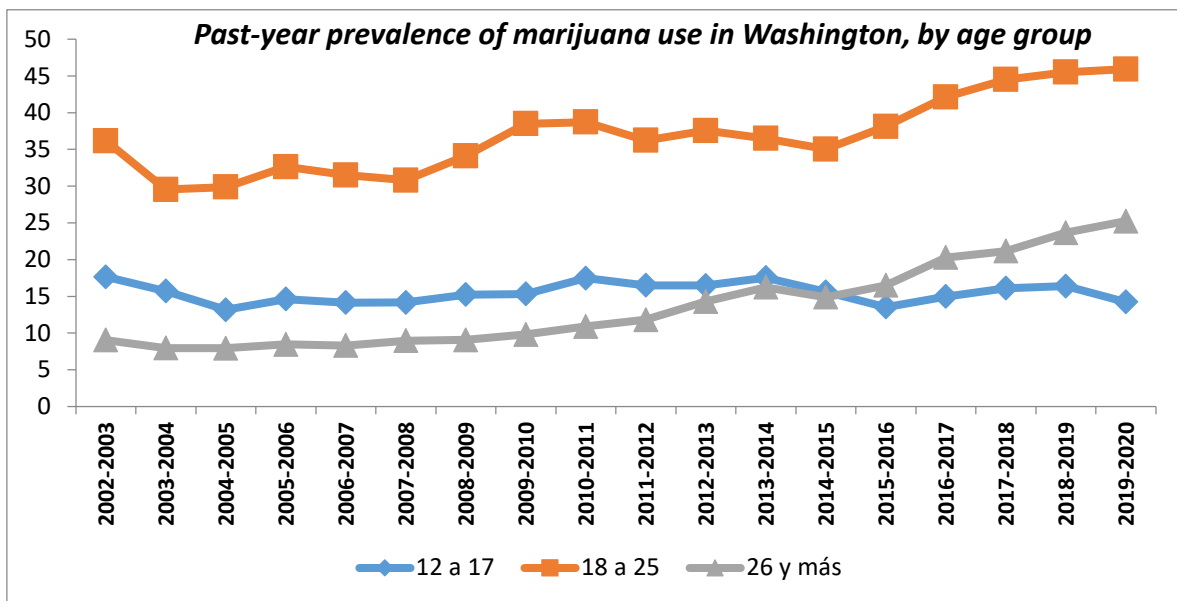


Figure 8. Past-year prevalence of marijuana use in Washington by age group.



Source: Substance Abuse & Mental Health Data Archive. (n. d.). Interactive NSDUH State Estimates. Retrieved from <https://pdas.samhsa.gov/saes/state>.

The organization responsible for national studies in the country (Substance Abuse & Mental Health Service Administration, SAMHSA) publishes interactive data (Substance Abuse & Mental Health Data Archive,

n. d.) on trends, both nationally and for all states, and it can be observed that the trends are very similar between states that have legalized marijuana and those that have not.

From this information, several elements of judgment can be deduced. First, it should be noted that there are no evident changes at the adolescent population level. Second, in those areas where an increase is detected after legalization, it can be observed that, in most cases, this increase occurs prior to the legislative change. Thirdly, there have also been increases in drug use, particularly marijuana use, in territorial spaces where the current model is maintained.

Information about marijuana consumption is just one aspect of the problem: the legalization or regulatory framework of marijuana also has other dimensions that must be observed and evaluated. For example, potential impacts on other areas of health, in security and drug trafficking and governance as well as in an economic and justice dimensions. But these impacts should concern us not only in places where a change has taken place but also where the current model is maintained. The dilemma we face is not legalization versus the non-existence of drugs, but rather a new regulatory framework versus the current model, in the context of a market that exists, whether we like it or not.

How do we move forward on these issues? Until a decade ago, no evidence existed as to what could happen if we abandoned the current prohibition model and moved in another direction. However, as mentioned earlier, there is not a single experience with legalization models. Each territory has made different decisions regarding various dimensions of the problem so each one must be evaluated based on its own reality. It is certainly still premature to draw categorical conclusions. However, it seems fair, and in the right direction, to monitor different aspects within each space, but not only in those territories. The same should be done in places where current legislation predominates.

This requires creating a rational and informed dialogue, where evidence prevails over prejudices, with the aim of generating the best public policies in this matter. In relation to this, it is interesting to recall a quote from Domingo Comas (Comas, 2014): “Professionals must know that at this historical moment we have a clear notion of scientific evidence and therefore they must assume that being guided by scientific evidence, especially when working with people, is an unavoidable ethical obligation.”.

Challenges

Likely it is here where we will find the great challenge in public drug policies (as well as in many other fields) soon: generate bridges that bring science and politics closer. Both are necessary, but they themselves are not sufficient for generating policies that address phenomena from their causes rather than focusing efforts solely on dealing with consequences. As mentioned before, these causes have different dimensions and work must be done on each one of them. And it is in this aspect where the public health approach plays a fundamental role.

We have seen with great concern that drug policies have been focused on “interventions” without a clear diagnosis for proper guidance of these policies or actions, and without a process of monitoring and evaluation. Clear diagnoses and evaluations have been absent in decisions that have been made on drug policies. It has been much more relevant to provide quick responses in the field of security rather than investigating the causes for drug use and, therefore, the demand for them. In the foreword of the 2012 report by the International Narcotics Control Board (INCB) (INCB, 2013), part of United Nations, an interesting reflection is made in this direction. It states: “To target the organized crime and violence associated with the illicit trade in drugs, the most effective tool is primary prevention of drug abuse, coupled with treatment and rehabilitation, and complemented by supply reduction measures, as provided for in the conventions.”. One may fully or partially agree with this proposal, but what is interesting about it is that it suggests that the “war on drugs” does not take place where supply occurs, but rather focuses on reducing substance demand. If this understanding does not exist in policymaking, then problems will only increase in the future: greater diversity of substances and more people using them.

In addition to this discussion, there is also a need to consider (and decide in some cases) expanding new regulatory frameworks for cannabis for recreational purposes from production to distribution and consumption across territories. A critical analysis of the impacts of these new policies in countries or geographic areas where they have been implemented is necessary. However, the same analysis must be conducted in places where the current prohibition regime is maintained. Once again, generating scientific evidence is crucial, as well as using it without bias. This discussion is still pending.

Regardless, the future will also be dominated by the crossroads posed by both new psychoactive substances and indiscriminate use of analgesics (particularly fentanyl), which, as mentioned before, account for an unexpected number of deaths from overdose in the northern hemisphere. The rest of the countries are not exempt from facing similar situations in the future.

Final reflections

Public policies are interventions that, although they should be based on scientific foundations, generally yield long-term results. This is the first major problem because the time required in that direction clashes with political timelines, which are usually short-term. It is much more visible and demonstrative of concrete actions to send the police to intervene in a population for drug and weapon seizures than to analyze the causes of the phenomenon and act based on those findings. Therefore, it becomes urgent and necessary to move from discourse about “evidence-based public policies” to making that intention a reality. The development and implementation of public policies are not abstract or innocuous issues since ultimately they are interventions that impact people’s lives, so it is our duty to make every effort to reduce risks associated with such policies.

It is this field that shows a great need that must be addressed by academia and particularly by Public Health institutions in countries. These needs can be channeled through different means, from forums and seminars to postgraduate programs. The concepts of scientific evidence and public health approach (closely linked indeed) must transcend administrative management as well as politics and become a matrix of thought, both conceptual and operational, for addressing social phenomena like these. Generating that much-needed bridge for both dimensions – politics and science – to have a space for sincere dialogue is urgent. Those who oversee decision-making processes must understand that using scientific evidence is the best way to reduce uncertainty about their actions. By following this path, we can be sure that we will have better responses beneficial to people.

Politics and science must be allies and work together. This is the great challenge.

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14. Sexual and Reproductive Rights: Keys to Equality and Full Citizenship

Pamela Eguiguren Bravo

Sexual and reproductive rights (SRR) are frequently approached from a public health and healthcare services perspective. While acknowledging their significant role in this domain, it is crucial to recognize that exercising these rights goes beyond improving health indicators. It also empowers individuals, particularly women, to realize their civil and political rights. The normalization of rights violations related to SRR often revolves around violence and influences social, political and identity-related spheres. These rights are essential not only for individual fulfillment but also for shaping the subject as political actor.

Chile recently experienced a crucial political moment regarding citizenship and its demands, with a focus on sexual and reproductive rights (SRR), which was put on the agenda by the diverse feminist movements. Despite the rejection of the constitutional convention in 2022, feminism's growing influence has continued to break barriers and shape the ongoing social movement by advocating for constitutional reform in the country. Now it is time to expand our understanding of SRR beyond solely sexual and reproductive health perspectives. This is both an example and an opportunity to deepen public health discussions on the right to health for various reasons. Overcoming disciplinary boundaries and limitations requires addressing social determinants and their intersectionality through social and political organization. Transforming social structures to mitigate health inequities must begin by depatriarchalizing our constitution, an essential step to depatriarchalize the State. The constitutional processes in our region point towards changes needed in our own context.

Gender Recognition and Sexual and Reproductive Rights

Sex categorizes human beings based on biological attributes while separating specific male/female reproduction functions binarily. Alongside this categorization process, human beings experiencing these functions have been and continue to be influenced by culture. The gender system operates in interaction with social structures and institutions through the socialization of rigid binary and hierarchical gender attributes (Guzmán, 2003). Sexuality and reproduction undoubtedly transcend biology as they are also social and political matters that involve decision-making. They are crucial aspects of people's lives for the realization of their individual and collective projects. Feminism, from its various spaces, has identified the injustices experienced by women and men in their diversity in processes

related to these matters and recognizes them as central to achieving equal rights (Seminario Prigepp Democracias, 2021). From there, sexual and reproductive rights have gradually gained greater strength within human rights discourse.

From a global health perspective, the earliest references to reproductive rights in international instruments date back to the late 1960s and early 1970s, highlighted by events such as the International Conference on Human Rights in Tehran (1968) and the World Population Conference in Bucharest (1974). They were primarily understood as couples' rights to freely decide on family planning methods including timing, number of children desired or spacing between births while establishing guarantees for information provision and education on reproductive health issues. It was at conferences such as The International Conference on Population Development held in Cairo (1994) and The World Conference on Women held in Beijing (1995) that previous conceptions were surpassed by a clearer understanding that moved decisively towards a broader sexual and reproductive sphere encompassing personal guarantees linked to freedom over one's body. These achievements undoubtedly reflected women's political action driven by feminism both within international organizations as well as women's organizations.

The SRR, as human rights, are interdependent with other rights; they are part of a framework that nourishes and enables the exercise of civil, political, economic, social and cultural rights. Rights like self-determination, autonomy, life and health are fundamental rights closely interconnected with free and informed decisions about sexuality and reproduction that take place in the first and most legitimate territory: the body. These are sovereignties and freedoms that must be recognized and protected by the State. This constitutes a crucial step to undo a patriarchal order that continues to impose itself in these spheres with high levels of discrimination, violence and coercion against the feminine spirit or any other subordinated otherness.

The feminist perspective has contributed to understanding in a situated manner the complexity and intersectionality through which restrictions on SRHR (Sexual and Reproductive Health Rights) are experienced along with their consequences. Restrictions become highly discriminatory when sexuality and reproduction focus solely on biological processes that take place within the body without considering that social and cultural contexts also influence biology. Astelarra (2005) reveals with great clarity what gender bias implies in the political sphere. The hegemonic readings and interpretations of women's participation hinder the full understanding of the limitations imposed by social order. They do so, by trivializing or relegating women participation to a secondary role. It is essential to focus on sexuality and reproduction because this field

undoubtedly requires intersectoral public policies but also faces difficulties in gaining ground in political discussions. Gender bias gravitates towards considering SRHR as a private issue and gives limited importance to female voices. Traditional power structures within politics often portray subordinations in this manner. This becomes very clear in Chile when reviewing legislative discussions that grant legitimacy to some voices over others; it is part of how patriarchy allocates value based on its worldview (Palma 2015). Significant obstacles remain represented by women's absence from political discussions and the unquestioned control that the State assumes it can have over women's bodies and their decisions. This leads us to think about the idea of a patriarchal state, as commented by Bareiro (Seminario Prigepp Democracias 2021) who visualizes and locates this axis of domination and reveals, in her analysis, the discriminations reproduced in our societies from its structure. The State and its agencies are the main actors in what it is defined as institutional violence, recognized by various legislations on gender-based violence in the region. Countless rulings from the Inter-American Court of Human Rights (IACHR) precisely demonstrate violations of SRHR with evident participation of the State through action or omission. In 2017, IACHR called on States to "adopt comprehensive and immediate measures to respect and guarantee women's sexual and reproductive rights"²¹.

The dominance of biological factors over social and cultural aspects is evident in this discussion. Prioritizing sex over gender helps to sideline the political dimension of this conversation. It may seem obvious, but as in any other aspect of social and human life, not everything related to sexuality and reproduction can be controlled. In patriarchy, ambivalently, women are punished for not taking control over their fertility while also being restricted access to tools that would allow them greater autonomy in keeping that control. Technology has allowed women to regulate their fertility, space out pregnancies, terminate unwanted pregnancies and undergo assisted fertilization. Excluding violence and accidents - unfortunately both so frequent - parenthood increasingly becomes a matter of decision-making faced with daily dilemmas. We know these decisions are crucial in life, especially in societies where reproductive consequences disproportionately rely on female resources, starting with their own bodies. However, despite abundant declarations supporting sexual and reproductive health rights, it is precisely gender order, based on political power or religion, that weighs most. In our country, and throughout the region, new barriers are erected against access to education and information and to ensuring that human and technological resources are devoted to greater autonomy of women in these areas.

²¹ <https://www.oas.org/es/cidh/prensa/comunicados/2017/165.asp>.

Restrictions on the exercise of sexual and reproductive health rights (SRHR) impact women as active political participants.

Limitations on the exercise of sexual and reproductive health rights (SRHR) impede women's full participation as political subjects. From a general perspective, Marshall (1950) presents a widely accepted conception of citizenship that encompasses a set of civil, political and social rights. Without exploring the concept of sexual citizenship, as coined by feminism, sexual and reproductive rights constitute a distinct and complex category of rights (Bareiro 2021). Exercising these rights directly and indirectly influences civil, social, economic and political rights; bodily integrity, self-determination and autonomy are crucial for achieving full citizenship. These restrictions exist within a complex social and cultural framework that extends beyond national borders and operates intersectionally. Therefore, according to Bareiro in reference to the Regional Conference on Women's Integration in Economic and Social Development in Latin America and the Caribbean, embracing full citizenship requires a regional and global perspective. The "Green tide" represents this transnational recognition and identification of demands for de-patriarchalization as well as the conquest of these rights by the feminist movement.

Understanding the link between SRHR and the exercise of citizenship requires an examination of sexual and reproductive rights and their violations. Among the most immediate ones, we find that girls, adolescents and adult women are victims of multiple forms of violence, in which sexual violence occupies a very relevant place. The figures of sexual abuse, sexual harassment and rape are sky-high in the country and the region, despite recognized underreporting²². Unwanted motherhood and a wide range of physical and mental health problems are among the consequences that impact women autonomy in all areas of social functioning. It is important to highlight that women experience this violence often within the family context. These violences are a major obstacle to women's citizenship construction since they limit a broad set of rights. Morris (2016) points out that for those who survive such violence active recovery of citizenship becomes unattainable without reliable networks or possibilities for justice and reparation. In addition, Segato highlights that access to quality justice systems for survivors of gender violence is also influenced by patriarchal logics (Segato 2003).

In relation to SRR and exercise of citizenship, unwanted motherhood is an important issue. Unplanned or early pregnancy takes place within sociopolitical contexts where women face significant limitations in avoiding

²² In 2023, nationwide, the National Institute of Statistic in Chile informed a total of 52693 victims of sexual crimes. Of this universe, the most frequent crime was perpetrated against girls under 14 years of age (32702).

or reversing it. Without accessible contraception services or voluntary termination options, pregnancy will have great consequences on women's life plans especially in situations of social vulnerability. As it often takes place within violent relationships, motherhood reinforces dependency that can lead them irreversibly away from personal development projects. It forces women into domestic care responsibilities and potentially exacerbates other vulnerabilities²³.

Some notes on SRHR and their approach in constitutions to advance citizenship

Countries' constitutions worldwide play a crucial role at advancing SRR and should contribute to a regional approach in addressing these issues. Chile experienced a pivotal moment in the constitutional debate in 2022, which provided an opportunity to review the social contract between the State and citizenship and to identify patriarchal nodes needing to be addressed in the construction of a new social pact. When reviewing the contents of Constitutions born within constitutional conventions in the region, like Brazil (1988), Colombia (1991), Paraguay (1992), Argentina (1994), Autonomous City of Buenos Aires (1996), Venezuela (2009), Ecuador (2008), Bolivia (2008) and Mexico City (2017), interesting results arise. The constitutions of two autonomous cities belonging to nations with federal states have also been included.

As this analysis focuses on gender equality and its relationship to sexual and reproductive rights, it is worth noting that all constitutions dedicate an article to equality of rights and opportunities of men and women. However, only a few explicitly mention gender equality or non-discrimination and only one includes "LGBTTTI" rights (Mexico City 2017, p. 51).

Sexual and reproductive rights

Within constitutions that recognize women and men equality as a basis, it should be highlighted that only the constitutions of Buenos Aires and Mexico City incorporate the gender perspective as such. The former dedicates an article specifically indicating the obligation of its application in the city's public policy design processes.

While nearly all texts acknowledge sexual and reproductive rights to some extent, few address them explicitly. As a general framework, the Argentine Constitution gives superior hierarchy to international treaties

²³ In Chile, according to figures from the National Institute of Statistics, around 472 girls under the age of 14 fulfilled a pregnancy in 2017. In most of these cases, Chilean regulation itself recognizes these cases as sexual abuse. (Instituto Nacional de la Juventud [Injuv] 2020).

signed by the nation over national laws regarding human rights. All constitutions recognize and adopt those signed frameworks, although with varying levels of hierarchy.

The Constitution of Mexico City (2017) exhibits a notable commitment to human rights, particularly in its comprehensive approach to SRR and addresses both types of rights in detail and separately. It provides a very comprehensive description of sexual rights and, in the case of reproductive rights, it mentions not only the right to decide whether to have children but also emphasizes the right not to have them: “The right to freely, voluntarily and informedly decide whether or not to have children, with whom, how many and when, without coercion or violence; as well as receiving comprehensive services for accessing the highest possible level of reproductive health and access to information on assisted reproduction” (p. 25). The Constitution of Buenos Aires (1996) also recognizes both types of rights, while Bolivia (2008), albeit briefly but clearly, states that it “guarantees women’s and men’s sexual rights and reproductive rights” (p. 16).

In the rest of the constitutions, except Ecuador (2008), which mentions people’s right “to make free and responsible decisions about their sexual life” (Chapter 2, Article 23 No. 25), approaches are more limited. They generally focus on reproductive aspects from a family planning perspective by guaranteeing the right to decide freely and responsibly on the number and frequency of children. It should be noted that there are differences when this right is explicitly stated as individual (Ecuador and Paraguay) compared to other cases that refer to couple’s rights (Brazil, Colombia and Venezuela).

It is also important that few constitutions explicitly recognize the interdependence, indivisibility and progressive nature of human rights (Bolivia, Mexico City).

Family

A significant portion of reviewed constitutions highlight family as a basic unit in society while explicitly declaring its formation based on a heteronormative marital regime. They recognize equality of rights between both spouses and members and, in all cases, explicit protection is granted to families where only one spouse is the head, especially in the case of female-headed households, which reveals recognition of gender inequities in society.

Only Bolivia and Mexico City refer to “families” and acknowledge diversity explicitly. The Mexico City constitution states: “All structures, manifestations and forms of family community are recognized with equal rights; they are fully protected by law and supported in their care tasks.” (Mexico City 2017, p.25). Alongside this statement, said constitution

explicitly declares “equal rights for families formed by couples of LGBTTTI people with or without children under civil marriage or any other civil union” (Political Constitution of Mexico City 2017, p.51). While roles are recognized and comprehensive protection for families is established in the Buenos Aires constitution as well as Bolivia’s (2008), neither declare family as a basic unit of society.

Although it may seem counterintuitive, family undoubtedly needs to be revisited as a basic nucleus of a constitutionally proposed social organization. Family is an entity that emphasizes and enables the division of public and private spaces and work between women and men. This space is linked to the reproductive sphere and is an important point of analysis for this discussion. It is not just about expanding the rigidity of its interpretation; it is important, of course, to make the diversity of family formation visible and overcome heteronormative approaches. However, along with this, it is imperative to recognize that a family is a form of organization that responds to a deeply patriarchal-model society functional to capitalist production forms. Concern for life care, values of solidarity and protection for others in society are mobilizers of social organization that exceed the limited boundaries of a nuclear family. In addition, another reality that cannot be ignored is that for a significant percentage of children, cis women and trans women consanguineous families could be dangerous places, that could even lead to their death. From an intersectional perspective, referring to the family as a univocal category of organization and social protection also hides and obscures heterogenous realities that often undermine the realization of all rights that constitute citizenship.

The family serves as a foundational unit for recognizing individuals in society, which emphasizes the necessity for legal status or acknowledgment of cohabitation among adults within marital unions to establish what is acknowledged as the fundamental nucleus in society. It raises the question as to how the Constitution ensures citizenship protection and social resources for those who opt out of traditional family structures; individuals who neither seek marital unions nor parenthood. In all constitutions, consistently, a triad – family, marriage, maternity – receives special protection, while other forms of societal existence are overlooked. This highlights a notable gap in safeguarding autonomy and self-determination rights.

Right to autonomy

Once again, the Constitution of Mexico City stands out in this recognition, far ahead of other constitutions that only use this concept of the right to autonomy for institutions and not within the scope of human rights. With multiple references, the Constitution of Mexico City highlights its transversality in application, which includes respect and protection of individuals’ autonomy by health care services regarding sexual and

reproductive rights:

Every person has the right to sexuality; to decide about it and with whom to share it; to exercise it freely, responsibly and informedly, without discrimination, with respect for sexual preference, sexual orientation, gender identity, gender expression and sexual characteristics, without coercion or violence; as well as the right to comprehensive sexuality education and health services with complete information that is scientific, non-stereotypical, diverse and secular. The progressive autonomy of girls, boys and adolescents will be respected (Political Constitution of Mexico City 2017, p.25).

The Constituent Process in Chile

The Constituent Process in Chile was marked by a significant focus on sexual and reproductive rights and echoes the comprehensive approach and specific guarantees set by the Constitution of Mexico City. This resonance underscores the fundamental role these rights play in ongoing constituent processes worldwide. Particularly in Chile, this emphasis gains paramount importance within the context of its current Constitution, imposed during the civic-military dictatorship, which reduced the State's role in social protection and reversed decades of progress in acknowledging and achieving collective social rights for the Chilean population. The long-standing debate regarding the need for a new Constitution gained significant traction thanks to the social outbreak in October 2019, which unified social forces to ensure the representation of all demands and perspectives. Spearheaded by the courageous actions of students and their rebellion, this movement aimed to address the deficiencies of the inherited constitution, notably its lack of provisions concerning social rights. The constituent process, characterized by both progress and setbacks and informed by a gender-balanced and feminist perspective, prioritized the SRR rights since its inception.

Based on the analysis of texts and their evolution over time, it is now more crucial than ever to recognize that ensuring sexual and reproductive rights is paramount in establishing substantive equality and full citizenship. To achieve this goal, a framework is to be established to safeguard individuals' rights in all their diversity to enable them to make autonomous decisions based on informed choices. Dimensions such as identity, sexualities, maternity and pregnancy termination require protection of their self-determination.

Another essential aspect was the centrality of gender as a foundational element in a new constitution. Through this lens rights must be upheld. Dismantling patriarchy requires recognizing its existence and addressing its consequences. Therefore, effecting significant social changes entails transforming an inherently unequal and subordinated structure that

hinders women's political participation and lacks guarantees concerning SRR matters.

Protection against gender violence should cover all forms of violence, including when SRR are violated by the State or its institutions. Ensuring quality access to public health services is crucial within policies aimed at equitably protecting SRR and promoting equality within a broader societal framework. Constitutions play a pivotal role in establishing fundamental principles and agreements for societies, and those revised through participatory constituent processes demonstrate an evolution over time. In terms of guaranteeing and addressing these rights, the Constitution of Mexico City stands out as a model in this field by showcasing a high level of understanding. An essential consideration is granting superior status to international human rights treaties over domestic laws.

Other important topics persist, such as addressing the delineation between public and private spheres, especially concerning the family dynamic. As highlighted by Guzmán (2003), achieving gender equality extends beyond providing equal opportunities. It requires women's active participation in redefining foundational norms and structures. This was reflected in the attempt to keep a gender balance among the members of the convention who drafted the new Chilean Constitution. Bareiro (2021) has astutely observed that while feminism has made undeniable strides in conceptualizing and advocating for women's rights, a crucial area remains that demands more attention: the structural framework of the State. This perspective gains significant relevance in the context of depatriarchalizing both the Constitution and the State apparatus, paving the way for the development of public policies that align with the principles of substantive equality and full citizenship.

As mentioned before, autonomy finds its first territory within one's own body. In 2017, the Mexico City's Constitution recognized the right not to become a mother. On March 15th, 2022, during the drafting phase of Chile's constitutional text subject to plebiscite by a constituent convention, a significant article was included:

Article 16 - All individuals are holders of sexual and reproductive rights. These include, among others, the right to decide freely, autonomously and informedly about one's own body, the exercise of sexuality, reproduction, pleasure and contraception. The State guarantees the exercise of sexual and reproductive rights without discrimination, with a gender perspective, inclusion and cultural relevance. It also ensures access to information, education, health services and benefits required for this purpose while ensuring that all women and people with gestational capacity have conditions for pregnancy as well as voluntary interruption of pregnancy, protected childbirth and voluntary motherhood. Likewise, it guarantees their exercise free from violence or interference by third parties whether individuals

or institutions²⁴.

This article was originally written closely before the 2022 plebiscite when hopes of closing gaps and addressing women's rights seemed within reach. However, on September 4th, 2022, the will of the citizens fell short of solidifying a new social pact. Despite Chile's proximity to advancing sexual and reproductive rights, recent events confirm that progress in this area remains challenging, with setbacks that extend beyond our borders. The subsequent constitutional proposal (2023), which was also rejected by the citizens, went too far in terms of restrictions and conservatism. The polarization of forces will have to find a meeting point, but without giving up what at this stage of development is non-negotiable.

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15. Unveiling the Longevity Revolution: Key Elements for a Comprehensive Understanding of the Phenomenon

Rafael A. Estévez Valencia, Jorge Ramírez Flores

We are currently experiencing what has been called the “Longevity Revolution“ (Kalache, 2013), with individuals now living approximately 30 years longer than their parents’ generation. This shift requires the creation of a more age-friendly society, particularly for those aged 65 and above. Urgent recognition is needed for the significant number of older individuals who possess the skills, motivation and health to remain socially and economically active well beyond the traditional retirement age.

While traditional societies have developed welfare programs for older adults, there is a growing population of healthy and highly competent seniors seeking to maintain their social and economic engagement. It is imperative to acknowledge their right to age well and actively contribute to societal advancement.

Rethinking our societal structures involves more than just healthcare considerations, although these are crucial in extending lifespan. Embracing active aging requires a holistic approach which encompasses aspects such as participation and security (International Longevity Centre Brazil, 2015). Research in health, physical fitness and social sciences plays a pivotal role in redesigning an aging society, fostering collaboration and coexistence among genders and generations and ensuring fulfilling lives for both current and future long-lived generations.

Some Biological and Epidemiological Data

A few years ago, a significant demographic milestone was reached when individuals over 65 years old outnumbered those under 5 years old for the first time in history (United Nations, 2010). Projections indicate that by 2060, older adults will represent 30% of the population (CEPAL, 2017). Against this backdrop, Chile is poised to become the longest-lived country in Latin America in the near future. With a current life expectancy of 80.3 years, Chile ranks among the countries in Latin America with the highest life expectancy (World Bank, 2020). Furthermore, Chile is experiencing a steady decline in its proportion of young people under 15 years old, which stood at only 19.7% in 2020.

Despite these trends, Chile lags behind in implementing necessary changes to ensure the social and economic engagement of older individuals, which is crucial for their physical and mental well-being.

Women tend to live longer than men. For instance, in South Australia, there are 126 women for every 100 men over the age of 65; and for every 100 men over the age of 80, there are 160 women (Australian Bureau of Statistics, 2012). Data and projections for Chile are consistent with these trends. When looking at population forecasts for 2050, women are expected to represent 54.4% of individuals over 60 years old in the country (Pontificia Universidad Católica de Chile, 2020).

Human life increasingly resembles a marathon rather than a hundred-meter race, which requires us to adjust our pace for the long distance ahead. The longevity revolution grants thirty or more years of life, often with the ability to remain self-sufficient. This suggests that a career choice made at 16-18 years old may not be the most suitable or fulfilling for a work life spanning several decades.

It is crucial to recognize that current policies and practices are rooted in a traditional assumption of a typical life course that requires updating. Policy decisions still presume that individuals over 65 form a homogeneous category. However, the health of older people is not static; it is influenced by decisions and circumstances that lead to increased diversity due to the cumulative effects of various instances and processes involved in biological aging (Campisi et al., 2019).

Nearly one-fifth of gains in life expectancy are attributed to years lived with illness (Jagger et al., 2008), a proportion that is even higher for women and individuals with fewer resources. Yet, lifestyle interventions such as exercise and diet have been shown to help maintain health in old age (Partridge et al., 2018). Many people experience long lives with fewer disease burdens (Andersen et al., 2012; Christensen et al., 2008), supported by numerous animal models demonstrating healthy aging processes (López-Otín et al., 2013).

Moreover, neurons in the human brain regenerate throughout life by renewing themselves and becoming activated by new challenges. This ongoing neurogenesis is one of the most intriguing research topics, with evidence suggesting that humans can regenerate neurons and potentially live up to 150 years. Neurons may be the longest-lived cells in the human body which highlights the challenge of investigating them to extend healthy life to such an age.

Recent discoveries highlight the longevity-promoting effects of ongoing neurogenesis in the human brain. Research indicates that our brain can generate thousands of neurons daily and we can maintain our cognitive capacity as we age. This regeneration happens in the amygdala, hypothalamus, olfactory bulb and cerebral cortex. Early findings suggest that neuron renewal occurs in other areas of the brain as well. For instance, Maura Boldrini and her team at Columbia University discovered that many older individuals retain cognitive and emotional capacities with neurons as healthy as those of young people, particularly in the hippocampus, which is crucial for emotions and cognition (Boldrini et al., 2018).

In conclusion, the potential for healthy and active aging exists, and the challenge is to extend this opportunity equitably to the entire population.

The Baby Boomers and Gerontolescence

The generation known as baby boomers is currently reaching the age at which retirement was customary. This generation was and continues to be revolutionary, having fought for social and sexual freedom in the 1960s and redefined the role of women in society. They were at the forefront of movements against racism, pro feminism and against homophobia. Never has a generation reached the age of 65 so well-informed, with better incomes, in good health condition and with a robust activism background. With this legacy, it cannot be assumed that they will approach old age the same way previous generations did.

The baby boomer generation transformed their youth into a period of experimentation, creativity and rebellion and redefined the role and impact of young people in society. They are currently redefining what it means to be an older adult. Their influence was decisive in the emergence of “gerontolescence“, a completely new transition period in human history. Given the number of older adults, it is unlikely that they will tolerate being ignored or not considered in their expectations.

It is noteworthy that while typical adolescence lasts five or six years, gerontolescence will last between 20 and 30 years. This extended period provides ample time to develop and define a completely new societal pattern. While it is essential to provide an appropriate place and network

for those who are vulnerable, the reality is that more elderly people insist on actively participating in their communities and the political arena.

Today, very few older individuals settle for passive roles, both in their own lives and within their communities. This active engagement should be valued and facilitated whenever possible. The current older population represents a great reserve of knowledge, memory, intuition and experience that must be effectively harnessed. In all policy development processes, these voices contribute to developing an approach that synchronizes from its foundation with any top-down initiative.

Many historical changes also have implications for family dynamics. Modern families look very different from those in 1970, with differences including smaller family sizes, more childless families and increased separations. There are also more same-sex families and people living alone. Modern families have diverse relationships between their members, such as adoptive parents, half-siblings and stepsiblings.

The increasing mobility of people around the world is another factor to consider. Many people have relatives who were born in other countries or who have emigrated to other countries. All these factors contribute to less certainty about who will care for individuals in old age. In Australia and Europe, for example, the most frequent caregivers are 70-year-old women who take on this role with their older husbands or parents. It is more common to have fewer children and more individuals live alone. People also have different partners throughout their lives and there is a significant presence of women in the workforce.

A new vision of the aging process

Health and well-being are influenced by a variety of factors, including social, economic, environmental and cultural contexts. Therefore, it is crucial to involve these sectors in developing policies that promote health and well-being while reducing the number of older adults living with disability and illness. While individuals can control much of their health, many health inequalities stem from social factors, which underlines the need for policies that address these social determinants of health.

The longevity revolution affects all countries. Both developed and developing nations face challenges related to pension programs and ensuring that older adults can lead valued and fulfilling lives. Countries

must adapt to this new reality of longevity to avoid social upheaval and generational conflicts.

Language plays a central role in advocating for the rights of older people. Expressions that classify older adults as “others“ or imply inferiority can be harmful and affect self-esteem, memory and longevity. It is essential to be aware of the impact of language on older adults and to use respectful and inclusive language.

Many local governments and community organizations address old age with a care-focused approach, but this can be detrimental to older adults who are not disabled. Isolating them in conditions of dependence can promote overall deterioration. It is urgent to create diverse options for the elderly population, including educational opportunities that keep them motivated and active.

In today’s world, it is crucial for older individuals to remain active users of information technology. Educational institutions and organizations catering to older adults will experience an increase in demand for a range of services, including evening classes, special interest learning and certification upon course completion.

Changes in fields such as occupational employment and volunteer activities offer opportunities to positively impact the well-being of older adults and contribute to the economic development of societies. A diverse elderly population and a changing workforce require broad and imaginative options.

The concept of retirement is evolving and the retirement age is being redefined or even discarded as an option. Retirement may offer opportunities for more selective activities and new professional specialties, rather than withdrawal into privacy or seclusion. It is important to recognize that older adults who continue working beyond the expected retirement age contribute to economic productivity and, thus, create vacancies for younger workers, which challenges the belief that they are a burden.

Preparing for a new extended old age

It is important for people of all ages to consider their own time as they age. There is a tendency to deny the reality of aging and see older adults as a

distant category unrelated to our own experience. This reluctance to confront age is an example of the defense mechanism Freud called “denial“, which distorts reality and hinders us from facing and resolving challenges. It is crucial for individuals to recognize the reality of aging and plan for their extended longevity. Quality of life, family coexistence and the health of older adults can significantly improve when we acknowledge that living 80 or 90 productive and healthy years depends largely on how we motivate, value and provide opportunities for them to update and train themselves, stay active and live integrated and valued lives in their old age.

As individuals age, they may experience a loss of independence due to illness, injuries or chronic conditions. Despite these physical limitations, individuals can keep autonomy in decision-making. Even if someone needs assistance to get dressed, they can still make decisions about what they want to wear. Maintaining relationships and social communication is as important as physical capacity. People who retain their autonomy have the right to make decisions related to their health, care and daily life.

It is essential to focus on the rights, rather than just the needs, of older adults. This is not only logical but also an ethical duty. While it is important to address their needs, it is vital to prioritize their human rights. In many societies, youth is highly valued while old age is often seen as burdensome, which leads to discrimination and disadvantage for older adults. This discrimination manifests itself in various ways, including limited access to services, education and job opportunities as well as abuse, neglect and societal exclusion.

These violations of older adults’ rights are common and place them among the most vulnerable groups in society. It is important to recognize and address discrimination, which often stems from insecurity, fear or ignorance. Access to rights can be limited for older adults who face frailty, disease, inability or isolation and see their capacity to exercise their rights and make decisions reduced. For instance, if information is only available online and an older adult cannot access a computer or lacks the necessary skills, their rights may be compromised. Older adults need to be able to develop basic digital skills to avoid social marginalization, and interventions using information technologies can help reduce this isolation (Chen & Schulz, 2016).

The perspective and course of active aging

As individuals age, they often aspire to maintain good health, reside in familiar surroundings and cherish meaningful connections with loved ones to celebrate life's milestones. This vision of aging involves a desire for health, happiness and fulfillment.

The concept of "active aging", developed by the World Health Organization (WHO), is a guiding principle. It embodies a notion of aging that is healthy, successful and positive and encompasses a wide array of experiences, contributions and societal engagements across various domains, including social, economic, spiritual and civic aspects. It emphasizes not only physical and occupational activity but also the maintenance of a high quality of life and continued contributions to society.

The pillars of "active aging" – health, participation and security – are considered essential. To ensure a lengthy and high-quality life, individuals believe in maintaining a healthy diet, engaging in socially enriching interactions that allow for community involvement and regularly participating in physical activity. Consistency in these practices is deemed essential, as taking preventive measures is often easier than dealing with health issues after they arise.

Participation in societal activities is also seen as crucial. It helps maintain self-esteem and a sense of value. The belief in continuing to contribute actively and productively to society at all ages is prevalent, as this can be particularly challenging after retirement. Maintaining relevance and building new relationships, especially for men, is deemed important to prevent feelings of social exclusion and introversion.

Comprehensive protection for older adults, including access to adequate housing, healthcare and pension coverage, is another fundamental need. This becomes even more critical in cases of illness or physical limitations.

The emergence of gerontescence as a new stage in human development offers an opportunity for visionary leadership. Societies that recognize and embrace the impact of the baby boomer generation on longevity stand to benefit greatly. The current and future gerontescents are aging with unprecedented levels of health, wealth, talents and skills, along with a collective history that enables them to respond effectively to the challenges of population aging.

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PART V.

ROLE OF DIFFERENT ACTORS IN A GLOBAL HEALTH SYSTEM

16. Health systems and their challenges in a world of increasing complexity

Óscar Arteaga Herrera

The field of health policies is related to areas that involve decisions, plans and actions at different levels of society with the purpose of achieving specific health objectives. More specifically, it can be stated that health policies are expressed in courses of action (or inaction) that affect health institutions and organizations, as well as the services provided and the financing modalities of the health system (Buse et al., 2012).

Converging within the broad field of public health, in its disciplinary development, health policies are oriented towards both population health problems and the factors that determine them, as well as efforts to improve responses to these problems through the organization of healthcare systems and services.

The commitment of United Nations Member States expressed in the Sustainable Development Goals, as part of Agenda 2030, has at its core the will to end poverty, protect the planet and ensure peace and well-being for all people (UN, 2015). Universal health coverage must be understood as a fundamental component in this global effort based on principles such as leaving no one behind and ensuring human rights for all (UN, 2015).

Conceptually, universal health coverage implies that everyone can access quality healthcare without suffering economic difficulties associated with payment for care (WHO, 2013). This is the foundation underlying WHO's Director-General's statement to the World Health Assembly in May 2012 when she affirmed that universal health coverage "is perhaps the most powerful concept public health has to offer" (Chan, 2012). Previously, the WHO had dedicated its World Health Report in 2010 to the topic of health system financing as the pathway to universal over age (WHO, 2010).

In the horizon established by Agenda 2030, in January 2020, the SARS-CoV-2 virus was officially identified by the Chinese Center for Disease Control and Prevention (China CDC) as the causative agent of the outbreak that began in Wuhan in November 2019 (Mizumoto et al., 2020) and three months later, on March 11th, 2020, the WHO declared Covid-19 a pandemic (WHO, 2020a). Thus, Covid-19, defined as the most serious global health threat since the Spanish influenza of 1918-1919 (Ferguson et al., 2020), is becoming a major obstacle on the path to sustainable development goals and universal health coverage.

Since its emergence, Covid-19 has had a significant health impact,

both in terms of people who have become ill or died from this disease and the impacts resulting from the suspension or postponement of care for other health problems, mainly chronic diseases, because healthcare resources were directed to addressing the pandemic emergency.

Beyond its health dimension, the Covid-19 pandemic has had dramatic social consequences. In fact, it has been estimated that there would be a global increase of 176 million and 177 million people living below international poverty lines of USD 3.20/day and USD 5.50/day per person, respectively (World Bank, 2020).

In this global panorama, Latin America and the Caribbean region are most affected by the crisis. It is estimated that in 2020 GDP shrank by 9.1%, with 2.7 million businesses closing down, which resulted in 44.1 million unemployed people and 231 million people living in poverty, out of whom 96 million would be people in situations of extreme poverty (ECLAC, 2020).

In the context described, the segmentation and fragmentation, equity issues in access and inefficiencies in care that characterize Latin American health systems (Vásquez et al., 2009) have been additional obstacles to facing the extraordinary challenge of Covid-19.

In this article, we will review some basic conceptual aspects of health systems and then address the challenges that are emerging so that these systems can contribute to reducing access inequities and strengthening the continuity of healthcare, thus guaranteeing the right to health from the perspective of universal health coverage.

Health systems and social security

The definition of health systems has important variations, especially regarding their boundaries (Figueras and McKee, 2012). However, the most widely accepted definition is the one proposed by the WHO in its World Health Report of 2000, indicating that a health system corresponds to “the set of organizations, institutions and resources that have the objective of generating health actions” (WHO, 2000:151). Some years later, the WHO expanded the definition by stating that a health system is composed of all organizations, individuals and actions whose main intention is to promote, restore or maintain health as well as compensate for permanent disabilities. This includes public, governmental, nongovernmental or private healthcare agents (WHO, 2007).

Health systems are part of larger social security systems, i.e., institutional modalities through which society organizes responses to

provide protection to individuals facing different states of need. Therefore, the values that prevail in a society are reflected in health systems and expressed in legal and institutional frameworks for formulating and implementing health policies and developing healthcare organizations. In this way, countries organize their health systems according to national values and principles to achieve their proposed health objectives.

Within this conceptual framework, a health system, besides its ultimate objective of contributing to the global improvement of health level, would also have two intermediate objectives. First, to respond to user expectations which are not technical expectations but rather related to dignity, confidentiality, autonomy, timely care, social support, basic amenities and choice of providers (WHO, 2000). Second, to aim for fair financial contribution, i.e., every individual contributes financially based on their financial capacity and uses the system based on their needs (WHO, 2000). This objective rests on the concepts of fairness and solidarity which are at the heart of any social security arrangement.

To achieve these objectives, within the conceptual framework proposed in its 2000 report focused on health system performance assessment, the WHO identified four basic functions of a health system: service delivery or provision, resource generation or creation, financing (resource mobilization and allocation) and stewardship (WHO, 2000). Among these functions, the first three can be carried out by public or private agents, but stewardship is an irremovable function of the State. Subsequently, WHO itself shifts focus from functions to components of a health system, in which it identifies six components: service delivery or provision, human resources for health, information, medicines and technology, financing and governance and stewardship (WHO, 2007). This new approach, which practically disaggregates the function of resource generation from the previous conceptual framework into human resources for health, information and medicines and technology, beyond its limitations, has generated a common language and provided a useful tool for planning processes, financing decisions and priority setting (Sacks et al., 2019).

In a broad perspective regarding the contribution that a health system makes to the society's well-being in which it is embedded, some authors (Figueras and McKee, 2012) recognize three areas: i) by producing health itself, which is a component of well-being; ii) as the health system is an important actor in economy, this means that the health system has a direct impact on economic growth; iii) by directly contributing to the society's well-being, since the existence of a health system and people's ability to access this contributes directly to satisfaction, whether or not they are effective or used by the population.

According to the social determinants of health approach, health

systems are considered an intermediate determinant of health (WHO, 2008). This means that while health systems alone cannot explain social inequalities in health, they can modulate differential vulnerability and exposure to factors that can harm people's health through their actions (WHO, 2008).

Challenges for Health Systems before Covid-19

Prior to the outbreak of the Covid-19 pandemic, challenges identified for health systems in transitioning towards universal health coverage were concentrated in three areas: availability of resources, high reliance on out-of-pocket payments at the time of seeking healthcare services, leading to financial burden, and inefficient and inequitable use of resources (WHO, 2010). In fact, in its 2010 report on financing health systems for universal coverage, the WHO states that countries closest to achieving this goal have chosen a path based on risk pooling within the population and adopting prepayment models. When policies enable access to these mechanisms for the population, achieving universal health coverage becomes more realistic (WHO, 2010).

Based on reviewing country experiences, WHO itself presents three lessons that should be considered when formulating aforementioned policies: i) in all countries a proportion of the population is too poor to contribute financially through taxes or insurance premiums (e.g., contributions to social security) and require subsidies funded directly by the State or premium subsidies; ii) contributions must be mandatory as otherwise wealthy individuals and healthy people will opt out of the system, which would result in insufficient financial resources to meet the needs of those who are poor or sick; iii) pooled funds protecting healthcare needs for a small group are not viable long-term as they are vulnerable to high-cost disease episodes and segregate populations. Wealthier individuals end up with better benefits from these funds and are not willing to subsidize poorer populations (WHO, 2010).

For some regions of the world, these challenges have been more specifically identified. Thus, for the health systems of Asian countries, ensuring coverage for the informal sector population has been posed as a challenge to achieve universal health coverage, to designing benefit plans that can effectively respond to current health challenges while being fiscally sustainable, and to ensuring preparedness of the provider response system, specifically availability and quality of services (Bredenkamp et al., 2015). In China's health insurance system, limited financial protection, inequities in healthcare delivery, poor portability and ineffective fund supervision and administration have been estimated as challenges (Shan et al., 2017).

In Latin American health systems, which, in terms of financing, represent arrangements with different financial sources including specific contributions for health (payroll taxes) as well as general taxes and out-of-pocket payments, the challenges that have been raised are focused on strengthening equity. This would mean increasing public spending on health which would translate into reducing the proportion of out-of-pocket expenditure within total healthcare spending and increasing fiscal expenditure (Titelman et al., 2015). Additionally, addressing these challenges would require developing a financing model that effectively integrates different sources of healthcare financing, namely fiscal contribution from social security and private spending (Titelman et al., 2015). Health expenditure as a percentage of GDP ranges between 5% to just over 9% in Latin American countries but, in most cases, public spending on health is less than 6% of GDP with out-of-pocket expenses reaching up to 43%. While several countries rely on general taxation for funding their systems there are high levels of informal economy, which makes revenue collection difficult (Kanavos et al., 2019).

Lessons learned about Covid-19

To be able to address the huge sanitary economic and social impact that Covid-19 has had worldwide the WHO indicated that response strategies should involve early decision-making at national level on public health actions as well as involvement of all sectors (WHO, 2020b). This is in line with the Health in All Policies approach established by the European Union under Finland's presidency in 2006 (Euro Obs Health Syst Pol, 2006) and later adopted by the WHO (WHO, 2014).

This would imply a comprehensive national response that should include public health interventions aimed at breaking the chain of virus transmission among people, identifying cases with their respective isolation, testing and clinical care for those who require it and contact tracing and isolation (quarantine). Additionally, to address different affected areas various sectors and actors should be included in this response (individuals, institutions, communities and local and national governments), each contributing from their specificities to the objective of controlling or stopping community spread of Covid-19 (WHO, 2020c). For example, if sufficient economic subsidies are not provided to vulnerable families so they can have resources to comply with quarantine measures then compliance is lower because family members continue going out to seek daily sustenance (MOVID-19, 2020).

In this context, the demand on healthcare systems, especially

intensive-care units (ICUs), from a large number of people falling ill simultaneously has stressed healthcare systems beyond limits that may have seemed unimaginable before. This has also required an unprecedented mobilization of healthcare systems (WHO, 2020c).

The threat of Covid-19 depends on the number of new cases that occur simultaneously at any given time and the capacity of the country's healthcare system to respond to the growing demand for healthcare (WHO, 2020c). Therefore, the ability of the health system to effectively respond to this demand depends on available resources, particularly hospital beds, intensive care unit (ICU) capacity and specialized human resources (WHO, 2020a), as well as a strong and responsive primary level of care that works in coordination with the populations it serves (Arteaga & Fuentes García, 2020).

Countries and their health systems have had different capacities to respond to Covid-19, which has brought forth the concept of resilience. While resilience has been central in the field of risk reduction, its application to health systems is relatively new (Haldane et al., 2021).

In this case, resilience has been defined as the ability of a health system to prepare for, manage (absorb, adapt and transform) and learn from shocks, i.e. sudden and extreme disruptions such as epidemics, natural disasters and financial crises (Sagan et al., 2020). More recently, Haldane et al., building upon this conceptual framework by focusing on institutional capacities and healthcare agents' preparedness for recovery while maintaining essential functions and addressing acute needs within their communities, expanded the concept of resilience to include dimensions such as governance and financing, personnel, sanitary products and medical technologies, public health functions, health service delivery and community participation in preventing and mitigating the spread of Covid-19 (Haldane et al., 2021).

Thus, the countries whose health systems have been more resilient are those that activate comprehensive responses by considering health and well-being as intertwined elements with economic and social considerations. They adapt capacities within and outside of the health system to meet the needs of communities, maintain functions and resources within and beyond the health system. This aims to continue providing healthcare related to the pandemic as well as routine and acute care unrelated to the pandemic and to reduce vulnerability to catastrophic losses in terms of health and well-being and financial aspects for individuals and households (Haldane et al., 2021).

Undoubtedly, the sanitary, social, economic and political crisis generated by Covid-19 is of great magnitude and has made the enormous

inequalities that persist in our societies more evident, especially in Latin American countries. Moreover, in terms of governance, the outbreak of the pandemic caught many Latin American countries amidst extremely complex and precarious political situations, characterized by citizens' distrust in government capabilities and very low levels of support for them. This further complicates managing the response to the health, social and economic crisis caused by Covid-19 due to reduced legitimacy of these governments.

However, the increased visibility of inequities has also provided opportunities for taking action and generating urgently needed changes. In the specific field of health systems, the response to the pandemic has also highlighted the importance of integrated and coordinated health systems, particularly public systems. This is reflected in public acknowledgments made by prominent political figures such as the Prime Minister of the United Kingdom and the President of France regarding their respective health systems (Macron, 2020).

An interesting experience to analyze is the response of Chile's health system to Covid-19, in which the sanitary authority, enacted through a constitutional state-of-emergency decree issued by the government, had established from the start a centralized management of total hospital beds availability from both public and private providers under an integrated health system concept (Minsal, 2020). This enabled patients requiring care to be derived regardless of their social security system to available ICU beds at both public and private hospitals. In practice, this meant integrating the functioning of public and private provider sectors into a single health system with a shared objective. Additionally, this generated a significant sign of equity, because in a situation where the hospital system's capacity was fully occupied, a high-income individual who had always easily accessed healthcare due to their high income might not find an available ICU bed because it would be occupied by someone who had been assigned the bed earlier by the health authority. The distress that this high-income person would likely experience in being unable to access healthcare is an everyday reality for the poorest and most vulnerable segments of the population and perhaps it can increase social awareness regarding the need to ensure access to healthcare for all individuals, regardless of their income levels, strengthen the principle of solidarity and facilitate the required changes in the health system.

To improve equity of access and strengthen the continuity of healthcare, it is essential to fortify integrated networks of health services (PAHO, 2010). In this perspective, two areas that require special mention are human resources for health and information systems. Human resources need to be appropriate in terms of quantity and quality. This will require state policies reflected in stable long-term agreements between governments and training centers, based on country objectives that transcend the

temporality of current governments. As for information systems, the greatest challenge is to integrate public health information with care-provider systems so that timely decisions can be made based on reliable information.

At international level, the challenges are not different from those at national level because inequities are reproduced among countries too. For example, while some higher-income nations discuss implementing booster doses for their populations, in most developing countries their populations, including healthcare workers, have not even received the first dose. Furthermore, in low-income countries less than 1% of the population has received vaccines (World Bank, 2021). The response to these realities has mobilized initiatives to strengthen solidarity among countries. For vaccine access, this is expressed in calls such as those made by the International Monetary Fund to ensure their application to 40% of the population in all countries by the end of 2021 and 60% by the end of 2022 (Agarwal & Gopinath, 2021) and the global access vaccine program (COVAX) from the WHO (WHO, n. d.), whose distribution agency in the region of Americas is the Pan American Health Organization's Rotary Fund for Vaccines (PAHO, 2021).

In another dimension, the experience with Covid-19 has also exposed the fragilities of the international system to generate alerts that could have enabled an early response and avoided the pandemic. The independent expert panel appointed by the WHO to examine the origin and development of Covid-19 not only established that the pandemic could have been avoided, but also that, if a new infectious virus were to emerge, the world would still not be prepared (UN, 2021). Based on this diagnosis, it has been proposed to establish a new global surveillance system based on total transparency that authorizes the WHO to report immediately on potentially pandemic outbreaks without approval and send experts to investigate if necessary (UN, 2021).

In a context of greater appreciation for public health, despite the adverse circumstances of recent times, progress can continue to be made in strengthening the right to health in line with the commitment to universal health coverage adopted by the World Health Assembly.

Conclusions

In the context of commitments derived from Agenda 2030 and the goal of universal health coverage, while guaranteeing human rights for all people and leaving no one behind, healthcare systems face significant challenges.

The Covid-19 pandemic, with its huge health, economic and social

impacts, has increased difficulties for healthcare systems to advance towards sustainable development goals and universal health coverage. However, beyond these impacts there are also lessons learned in healthcare system responses to the pandemic.

Midst strategies for responding to Covid-19 with national-level decision-making processes regarding early public health actions involving all sectors, in an approach known as “health in all policies”, countries and their healthcare systems have had different capacities for response, which is related to the resilience of these systems.

The Covid-19 pandemic has made the dramatic inequalities and inequities within countries, especially in Latin America, much more evident. However, the pandemic has also facilitated visualization and appreciation of the importance of integrated and coordinated health systems, particularly public systems, as well as increased awareness of existing inequalities and the need to develop policies aimed at reducing inequities.

The experience of Covid-19 has only strengthened the urgency to develop policies to increase the availability of financial resources for health, reduce out-of-pocket spending as a percentage of total financing, improve efficient and equitable use of resources and strengthen the development of integrated and coordinated health systems from a rights-based approach that puts individuals and populations at the center to respond to their needs.

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17. Impact of Regional Cooperation and Free Trade Agreements on Access to Medicines

Tatiana Tobar Aravena

Introduction and a National Historical Perspective

This article reviews various aspects of intellectual property that have impacted access to medicines, by analyzing some of the trade agreements that Chile has signed, as well as regional integration and collaboration initiatives in which it has participated in order to advance towards fair pricing. The analysis is based on the premise that medicines play a socially important role, as they are an integral part of achieving a fundamental human right: the right to health. Therefore, they are classified as essential goods and it is emphasized that they should be accessible to all individuals (WHO, 2001), a topic currently under discussion in the proposed Law on Pharmaceuticals 2 (Gobierno de Chile, 2015).

A significant development in this field was the creation in Chile of the National Drug Formulary (NF) in 1969, making the country a pioneer in the Americas region for developing a public health policy based on access to generic drugs (Gobierno de Chile, 1968a). This initiative preceded the publication of the World Health Organization's List of Essential Medicines.

According to the Sanitary Code, this NF shall contain a list of indispensable pharmaceutical products in the country for efficient therapy: a basic arsenal that should be available at every healthcare facility to respond and treat society's most common diseases (Gobierno de Chile, 1968b).

To understand its importance, analyzing it just from the perspective of physical access to medicines is not enough. We must also consider that it is a list of "generic products". These are medications distributed without any brand association or ties to pharmaceutical companies or potential loyalty from prescribing professionals. They correspond only to products identified by their official health nomenclature defined by the WHO, known as International Nonproprietary Names or INN.

The INN nomenclature was established in 1950 to provide unique names exclusively for public use and non-appropriable to active ingredients, which are the ones that exert therapeutic action within a pharmaceutical product. Thus doctors, pharmacists, scientists and patients can easily recognize and identify them worldwide (WHO, 2018). It is a useful tool for

identifying chemical molecules as it assigns simplified names to active ingredients based on their chemical or IUPAC nomenclature. For example, the antihistamine drug whose INN is Chlorphenamine Maleate has the chemical name of 3-(4-chlorophenyl)-N, N-dimethyl-3-pyridin-2-yl-propan-1-amine, an impossible name to learn or include in a prescription for an allergic patient.

In addition to developing the National Formulary list in the 1960s, Chile invited the entire pharmaceutical industry to join in producing these medicines (Vergara, 1997). However, only Laboratorio Chile accepted this invitation. Established as a joint-stock company with state contributions from the Social Security Service, Private Employees Fund, National Health Fund and Carabineros' Pension Fund, the laboratory supplied both public and private sectors. The objective of this measure was to promote access to essential medicines for all population groups at fair prices while allowing pharmacies a profit margin of up to 30% above cost price.

The issue of price differences between generic drugs with INNs and branded drugs has existed since those times. In February 1972, the Undersecretary of Health Dr. Carlos Molina stated: "There is no drug or active ingredient that is not accessible for popular consumption through either NHS²⁵ [National Health System] or pharmacies. Epamin is said to be missing; it is just a brand name for a product whose active ingredient is phenytoin. This medication is normally manufactured by Laboratorio Chile under the National Formulary at one-fourth of the price of Epamin and can be found in all pharmacies across the country" (Vergara, 1997).

In line with this, in 1974, the nationwide newspaper *El Mercurio* stated: "Thus, a comparison between prices listed in the National Formulary and those of drugs not included indicates that the former can be up to 80% lower than competing laboratory products. In summary, it can be said that at this stage, the National Formulary plays an effective regulatory role within a healthy economic freedom" (Vergara, 1997).

This generic drug policy was so successful that the production of Laboratorio Chile increased by 600% between 1969 and 1972. Even though it ended in 1987, the image on those products' labels with the words "Formulario Nacional" or the acronym "FN" on white containers with red and

²⁵ In 1952, Law No. 10,383 was enacted that established the National Health System (NHS?), an organization responsible for the protection of the entire population's health and the promotion and recovery of the health of workers, their spouses and children up to 15 years old. Its creation involved merging the General Directorate of Charity and Social Assistance, the Medical Service of the Workers' Insurance Fund, the National Health Service, the General Directorate for Child and Adolescent Protection, the technical section on Hygiene and Industrial Safety of the General Directorate of Labor, municipal medical and health services and Chile's Bacteriological Institute.

blue inscriptions is still remembered by Chileans and they associate it with low prices. Laboratorio Chile is currently a private transnational company with Israeli capital belonging to the TEVA group and has maintained similar graphics on its labels to the ones the National Formulary used to have.

During the military dictatorship (1973-1990), many of the achievements that had been made in terms of access to medicines were undone. So were the generic drug production system and price regulation. The Pharmacy Circuit Law, which defined a minimum distance of 400 meters between pharmacies in order to facilitate access and expand territorial availability of medications (Gobierno de Chile, 1942), was repealed. It should be noted that these establishments were generally owned by pharmaceutical chemists (Colegio Químico Farmacéutico y Bioquímico de Chile A.G., 2003).

Thus, this place where people used to seek pharmaceutical guidance and health advice, gradually transformed into a commercial entity whose main objective became to maximize profits at the expense of people's health goals. This was facilitated by vertical integration, where a company owns both a chain of pharmacies and a pharmaceutical production laboratory. Employees, whether pharmaceutical chemists or specialized assistants, were required to recommend products from the pharmacy's affiliated laboratory while receiving additional commissions based on how convincing and influential they were with customers. There was also an incentive system called "canela" (which means "cinnamon") that provided commission for selling certain branded products at high prices. In summary, it was a detrimental set of incentives.

The situation has changed since modifications were made to the Sanitary Code in 2014 which prohibited practices that incentivized or favored certain products over others (Gobierno de Chile, 2014), thanks to the work of pharmaceutical chemist professionals and the exposure and denouncement by pharmacy assistants who opposed receiving their salaries through these mechanisms. Another important and decisive factor was the collusion scandal involving the three main pharmacy chains: Ahumada, Salcobrand and Cruz Verde. They were accused by the National Economic Prosecutor's Office (FNE) of colluding to increase prices of more than 200 products between November 2007 and April 2008 (Cruz, n. d.). Although this process ended with sanctions much lower than expected, which was favorable to business interests (Sernac, 2019), it exposed improper commercial practices.

Undoubtedly, this illegal practice influenced widespread support from citizens for the initiative of "Farmacias Populares" (popular pharmacies) launched by Recoleta's Mayor Daniel Jadue in October 2015. As he stated, it was a measure to improve access and challenge the economic model

(García, 2015). This initiative establishes pharmacies for selling medications directly to the public obtained from the Central Supply of the National Health Services System (CENABAST) at cost price; in other words, it is an intermediation rather than a commercial activity. This not only reduces out-of-pocket expenses but also creates a grassroots-based public policy that has been well received and replicated by other municipalities. In 2021 there were over 150 establishments throughout the country.

In terms of medications, globally speaking, vaccines deserve special mention as they are biopharmaceutical products regulated similarly but, because of their strategic nature in health matters including aspects related to autonomy and health sovereignty, they are treated separately. The development of Covid-19 pandemic has brought vaccines into focus in market discussions.

The production of vaccines and serums by the Chilean State between 1887 and 2005 encompasses the transition from a developmental State where national industry produced vaccines, to a neoliberal State. It was institutionalized with the 1980 Constitution, in which, due to political decision and disinvestment in vaccine production at the Institute of Public Health (ISP) (Ibarra & Parada., 2020), its plant was closed, and Chile became completely dependent on the private market for these essential products in public health. For further information on this topic, we recommend a comprehensive and recently published article by Cecilia Ibarra and Mirtha Parada, which outlines the production of vaccines and serums by the State of Chile during the aforementioned period (Ibarra & Parada, 2020).

Pharmaceutical patents and medicines in Global Health

Through pharmaceutical invention, patents and data protection, the world of Intellectual Property is related to the Health Rights of individuals, both established in the Political Constitution of Chile of 1980. Intellectual Property has to do with creations of the mind; inventions, literary and artistic works, symbols, names, images and designs used in trade⁴⁹ which, according to the most accepted classification, are divided into two categories: Industrial Property, including inventions, patents, trademarks, designs, industrial drawings and models and geographical indications; and Copyrights covering literary and artistic works, art works and architectural designs.

As stated in the history of the UN when World War II was about to end, nations were in ruins and peace was desired. Worldwide representatives from 50 countries met in June 1945 at the United Nations Conference on International Organization to draft and sign the Charter of

the United Nations to create a new international organization with bodies and institutions such as the World Intellectual Property Organization (WIPO)²⁶ and the World Health Organization (UN, n. d.).

In that same decade, besides rebuilding international institutions, some countries considered it necessary to organize a system for trading goods, services and products, so they gathered around an agreement known by its English acronym GATT (1948-1994), i.e., the General Agreement on Tariffs Trade one²⁷. Its goal was to create an international trade organization which materialized in 1994 during the last round, the GATT Uruguay Round, which gave rise to the World Trade Organization (WTO) to liberalize international trade.

WTO agreements bind governments through legal norms governing international trade favoring importers, exporters and producers of goods and services from developed countries (WTO, 2017) by establishing common standards for all members, regardless of their level of development or progress. At most it differentiates the implementation period of the subscribed obligations.

During the Uruguay Round, besides the creation of the WTO and the regulation of goods and services, also trade knowledge and ideas were regulated through the Agreement on Trade-Related Aspects of Intellectual Property Rights²⁸ (TRIPS), which incorporated intellectual property as another activity within the commercial flow between countries. According to Joseph Stiglitz²⁹, signing TRIPs meant signing a death sentence for the poorest countries, abruptly ending the gradual health development process of each country and forcing standardization on intellectual property legislation in all member states, including pharmaceutical product protection (Rengifo 2021). According to Marco Arellano, TRIPS is perhaps the most powerful expression of political and commercial pressure causing almost a global obligation to protect pharmaceutical products, while overlooking ethical reproach that could mean linking human health with the establishment of a system of dispute settlement, subject purely to commercial issues (Arellano & Tobar 2012).

TRIPS requires patenting pharmaceutical molecules or active

²⁶ World Intellectual Property Organization (WIPO). Organization's website: <http://www.wipo.int/portal/index.html.es>.

²⁷ General Agreement on Tariffs and Trade.

²⁸ The TRIPS Agreement was signed in Marrakech, Morocco, on April 15th, 1994. Available at: https://www.wto.org/spanish/tratop_s/trips_s/trips_s.htm.

²⁹ Joseph Stiglitz, economist, public policy analyst and American professor. He received the Nobel Prize in Economics in 2001.

principles for a minimum period of 20 years. This not only granted exclusive marketing rights to pharmaceutical companies but, also during that period, obliged countries without price regulation systems to pay the value imposed by the industry until other alternatives could enter the market and generate price reduction through competition.

Despite its mainly commercial nature, TRIPS includes certain exceptions or limitations for public health issues regarding patented medicines urgently required in situations of health emergencies. These state that members, when formulating or modifying their laws and regulations, may adopt necessary measures to protect the public health and the nutrition of the population, including use by government or third parties authorized by government (WTO 2017). In an emergency, in order for a patented medicine to be used by the population, a government can make use of compulsory licensing which is the permission granted/issued by said entity to produce a patented product without consent from the patent holder when, after negotiations, no voluntary license is granted (WTO 2017).

In 1996, the WHO, based on Iran's proposals, discussed the consequences of globalization and trade agreements on access to medicines at its World Assembly and adopted the Revised Drug Strategy Resolution (WHO, 1996) which highlighted the need to establish a link and joint work between the WHO and the WTO. While the WHO provides technical support to countries based on recommendations that governments can incorporate into their national regulations, many of the initiatives of the WHO have been driven not by countries but by civil society organizations. For example, the document "Globalization and Access to Medicines: Perspectives on TRIPS/WTO Agreement" (WHO, 1997), published by the WHO's Essential Drugs Action Program in 1997, identifies from a health perspective all safeguards contained in TRIPS that enable countries to protect health and promote access to medicines (Tobar, 2015).

In 1997, South Africa implemented the Medicines Act or Amendment Act on Control of Medicines and Related Substances, which regulated issues such as generic substitution and parallel imports in its National Drug Policy (Republic of South Africa, 1997). The United States strongly opposed this move with both its pharmaceutical industry and the Clinton administration, with Al Gore leading this litigation. Dylan Mohan Gray points out in his documentary "Fire in Blood" (2012) that it took Washington 40 years to threaten South Africa with sanctions over apartheid but less than three months to threaten Mandela's government over HIV/AIDS drugs after apartheid.

Although Mandela was not violating what was established in the TRIPS agreements, the pressure from US on the South African government for trying to provide HIV treatments resulted in an agreement during the

World Health Assembly in 1999. Here it was stated that the WHO should analyze and inform member states about public health problems related to international trade agreements as public health interests prevail when formulating pharmaceuticals policies and healthcare policies (WHO, 1999).

Finally, as a result of actions like the South African amendment followed by Brazil's threat to implement compulsory licenses for the delivery of antiretrovirals to HIV patients in 2001, the proposal by the African Group to include discussion on access to medicines in TRIPS Council Agenda and a specific request from Zimbabwe to WTO for issuing a special declaration on Public Health supported by WHO (WTO, 2001b) at the 4th WTO Ministerial Conference held in Doha, Qatar (2001), apart from main agreements (WTO, 2001a) a specific agreement was established for Public Health: The Declaration on the TRIPS Agreement and Public Health (WTO, n. d.). Although it did not incorporate new topics or flexibilities, it basically marked a before and after in terms of security given to States to use these flexibilities in health matters and it has served as a tool to curb pressures and accusations of illegality from industry without any foundation.

The declaration states that TRIPS should not prevent members from adopting measures to protect public health but that it should support the right of States to protect public health and particularly promote access to medicines for all people (WTO, 2001a). It recognizes the right of granting compulsory licenses and the freedom to determine conditions under which such licenses are granted. Each country has the right to determine what constitutes a national emergency or other circumstances of extreme urgency with the understanding that public health crises can represent national emergencies or other circumstances of extreme urgency (Correa, 2002).

This healthcare tool within international trade was developed with certain difficulties while public health needs still exist. A few successful examples of implementing compulsory licenses are Malaysia, Indonesia, Mozambique, Zimbabwe, Zambia, Eritrea and Thailand. In our region, we only have Brazil in 2007 and Ecuador in 2010. However, implementation has not been easy as we saw during the Canada-Rwanda process which lasted about five years (Correa, 2002).

Many factors can influence the success of implementing compulsory licensing such as political will, lack of knowledge, fear among responsible government officials, industry pressure, threats from developed countries, incorporation of the tool into national legislation, development of regulations and the functions and powers of different institutions in economic or health areas and their relationship with each other.

Patents and health registrations in Chile

Chile, as part of the WTO and in compliance with TRIPS, through the National Institute of Industrial Property (INAPI), grants patents for medicines; that is, exclusive marketing rights for a product or procedure for a period of 20 years from the date the patent is applied for. In terms of pharmaceutical products, a patent can be granted for a molecule or an active ingredient, for a process of preparing a pharmaceutical formulation or for a second use or new therapeutic indication of a compound, while meeting the requirements of inventive level, industrial application and novelty (Gobierno de Chile, 2006).

Companies holding a pharmaceutical patent can only exercise exclusive marketing rights over the pharmaceutical product once they have obtained health registration to allow distribution in the country. This registration is granted by the Public Health Institute in Chile (ISP) after thorough evaluation and compliance with safety, efficacy and quality parameters (Gobierno de Chile, 2011). Pharmaceutical products can be categorized as new or similar. New ones are those that may contain, among other novelties, a new molecule which is either a new active ingredient or chemical entity. Similar products are those that do not differ from an already registered one³⁰.

Preclinical and clinical studies must accompany health registration applications for new products. For similar product registrations, presentation of such studies cannot be required since their safety and efficacy have been proven and it would not be ethical to experiment on people again without any benefit to humanity. This principle is stipulated in the Declaration of Helsinki (World Medical Association, 1964) because of atrocities committed against people during World War II.

From this we can conclude that a pharmaceutical product distributed in Chile with a new active ingredient must have health registration; however, it may or may not have patent protection. To access certain medications that are not registered in Chile yet but authorized by the ISP, provisionally sold or used without prior registration due to urgent medicinal use, scientific research, clinical trials and when unavailable in the country (Gobierno de Chile, 2011). This authorization is granted after evaluation and through a resolution that serves as a registration resolution.

This situation may arise for example when private entities decide not to register a medication in the country, such as the controversial case of the morning-after pill (emergency contraceptive). The pharmaceutical industry

³⁰ A similar medication has the same pharmaceutical form, concentration, active ingredient, route of administration, and therapeutic indication as one already registered (Editor's Note).

had ideological reasons not to register the medication in Chile. Therefore, CENABAST and APROFA³¹ had to make arrangements with the ISP to import it through this exceptional route and make it available to users. Thus, Levonorgestrel, in addition to being part of ministerial programs on sexual and reproductive health, was included in the National Formulary. This exceptional authorization process is also being used for distribution of vaccines for Covid-19 treatment since there are no health registrations granted by the ISP, only exceptional authorizations for distribution within the country.

International trade agreements and access to medicines in Chile

Surprisingly, Chile is the country with most agreements in the world: 30 agreements with 65 economies. These are commitments or trade obligations of different categories: Strategic Partnership Agreements (SPA), Free Trade Agreements (FTA), Economic Complementation Agreements (ECA) and Partial Scope Agreements (PSA).

The political chronology of Chile shows that, in 1949, the country signed trade agreements, not because they were visionaries but because the nitrate catastrophe forced them to integrate into international trade, according to history. Chile was a founding member of GATT and in 1995 became a founding member of the WTO. It established an ECA with MERCOSUR³², and agreements with Central America, the European Union, China and Japan among others. However, in terms of health, the most impactful agreement is the FTA signed in 2004 with the USA, since many obligations related to pharmaceuticals under TRIPS were incorporated into this text with more demanding clauses. Therefore, this agreement is called TRIPS Plus³³.

On another note, we have the Trans-Pacific Partnership (TPP), which is an agreement led by the US and has a high impact on health as it introduces strong measures for intellectual property protection. The TPP originated from the Trans-Pacific Strategic Economic Partnership Agreement, also known as P4 Agreement, and was created in the Asia-Pacific Economic Cooperation Forum (APEC). It is a free trade agreement that Chile signed in 2006 along with Brunei Darussalam, New Zealand and Singapore.

³¹ Chilean Association for Family Protection. Organization website: www.aprofa.cl.

³² Southern Common Market. Organization website: <https://www.mercosur.int/>.

³³ The Free Trade Agreement between Chile and the United States was signed on June 6th, 2003, and entered into force in Chile on January 1st, 2004. Available at: <https://www.subrei.gob.cl/acuerdos-comerciales/acuerdos-comerciales-vigentes/ee-uu>.

Later, the US joined this bloc during the Bush administration and transformed it into the Trans-Pacific Partnership Agreement and was also joined by Australia, Canada, Japan, Malaysia, Mexico, Peru and Vietnam.

As a result of TRIPS and FTA with the USA, our Industrial Property Law from 1991 was modified in 2005 and 2007 to increase the patent protection term from 15 to 20 years. Furthermore, an additional period for supplementary protection was added once the patent is granted by the INAPI or health registration by the ISP, due to unjustified administrative delays in granting patents or health registrations. This extra period can be requested at the Industrial Property Court (TDPI)³⁴. In case of patents, this benefit could be justified. However, delay in granting a health registration for a new active ingredient is justified if its safety and efficacy have not been demonstrated yet. Under no circumstances should the registration be granted until the health authority has all the necessary information to ensure it is safe for the population.

Another addition from the FTA with the US is the definition in the industrial property law of a new chemical entity which corresponds to a new active ingredient, including health protection measures for studies accompanying the health registration of pharmaceutical products with a new active ingredient, which grants exclusive marketing rights for 5 years once registered. This measure could favor those products containing new active ingredients that do not qualify for obtaining a patent due to the lack of an inventive step, e.g., the invention of Omeprazole could obtain a patent but its derivatives like Esomeprazole and Lansoprazole could not, as they correspond to minor modifications. Since it is a new product in the health field it can choose to obtain data exclusivity known as undisclosed information or data protection, a benefit granted by the ISP during which similar products cannot be registered even when the health authority has already formed the conviction that such active ingredient is effective and safe (WHO, 1997).

When there is a registered medicine with health protection, for 5 years the ISP cannot use the information it has to grant registration for similar products. If a company wanted to register a similar product within this period, it would have to present its own studies, thus forcing the repetition of human trials. This goes against what is stated in the Helsinki Declaration of the World Medical Association, as it forces experimentation on humans without any benefit to humanity, but only economic benefit for a private company. These forms of protection incorporated in the FTA with the US are included in the TPP and have been called red lines in terms of health due to their negative impact on access³⁵. The Ministry of Health issued a report on

³⁴ Institution website: www.tdpi.cl.

³⁵ Undersecretariat of International Economic Relations. Institution website: www.subrei.gob.cl.

the impact of the TPP and also requested Chile's withdrawal from this treaty³⁶.

One red line is *linkage*, which would administratively link the ISP and the INAPI, forcing the ISP not to grant health registrations in case of conflicts between companies over pharmaceutical patents. In Chile, health registrations are granted by the ISP and patents are granted by the INAPI; both institutions act independently from each other and are governed by different laws. The industry must resort to courts in case of conflicts arising from these matters.

Another red line under the TPP is second-use patents with lax criteria. This means granting a patent for a new indication of an already known product, which does not meet the novelty requirement since such indication was always an action of an already patented product described in its monograph.

Red lines related to a health agency include extending health protection granted by the ISP from 5 to 8 years for new biologic pharmaceutical products. This was one of the most discussed topics during negotiation rounds. The TPP also establishes the creation of 3-year health protection for new therapeutic indications – a quite complex situation as it would prevent using or prescribing a product for second indication – a restriction difficult to control in practice.

Lastly, reference registration was established as a red line to grant health registration solely based on registration with another health agency to a product without it undergoing an evaluation process but receiving all health protection benefits possessed by that agency, which turns us into a mailbox country. It is worth noting that changes in health regulations have already incorporated this mechanism.

Another topic discussed under the TPP but not commented here is the potential patenting of plant species, issues related to internet service providers and the existence of special tribunals that would hinder the implementation of regulatory improvements or public policies which could be subject to demands from international companies.

After years of intense negotiations, the TPP was closed in October 2015 in Atlanta, USA. In 2017, the Trump administration announced the withdrawal of the US from the treaty and the remaining eleven countries

³⁶ “The Fourth Attachment is an instance that the Subrei has established to inform, either the start of a trade negotiation or to communicate its progress during the process, in order to generate a dialogue with interested parties.” Subrei (2021) “What is the Fourth Attachment?”. Available at: <https://www.subrei.gob.cl/participacion-ciudadana/cuarto-adjunto>.

continued negotiating the treaty now known as TPP-11 with some measures “suspended” but not eliminated. Michelle Bachelet, President of Chile signed it in 2018 and only parliamentary ratification is pending. The process has been ongoing since then.

Regional initiatives for health collaboration on access to medicines

Medicines are considered an essential social good and main therapeutic support to maintain health. As for their availability, they pose a great challenge for the region. Therefore various strategies or technical collaboration initiatives have been implemented between countries to access quality medicines at fair prices. Emblematic cases of collaboration, cooperation, negotiations and joint purchases include Oras Conhu’s³⁷ initiative and Mercosur’s initiative where Health Ministers, supported by the Pan American Health Organization (PAHO), using Strategic Fund³⁸, have gained access to medicines at much lower prices than market prices to provide healthcare coverage for their populations.

In 2003, Oras Conhu accompanied by the PAHO managed a negotiation process and joint purchases of antiretroviral drugs and reagents in the Andean Subregion for HIV treatment. This was successful initiative during its first two versions as it achieved discounts up to 93% on prices for first-line triple therapy regimens. However, the pharmaceutical industry holding the monopoly over treatments and patents did not participate in the third negotiation and thus stalled progress; nevertheless, it remains an example of successful organization for access to medicines.

In 2015, during meetings of technical experts on medicines in Mercosur, the possibility of negotiations and joint purchases among member countries and associated states began to take shape again with support from Unasur³⁹ and the PAHO. In the negotiation led by Brazil, HIV and Hepatitis C drugs were included. Companies with registrations for these products were invited but some decided not to participate while others did not modify their prices as they held patents and considered that, since there were no alternatives to their drugs, countries were obliged to pay what they

³⁷ Andean Health Organizations (Oras) of the Hipólito Unanue Agreement (Conhu). Organization website: <https://www.orasconhu.org/>.

³⁸ The Strategic Fund PAHO is a regional supply fund for which pharmaceutical production companies apply at very low prices. Available at: <https://www.paho.org/es/fondo-estrategico-ops>.

³⁹ Union of South American Nations, a South American integration organization, created in 2011. In 2018, because of changes in the political trends of governments in the region, Chile and other countries withdrew. Available at: <https://parlamentomercosur.org/innovaportal/v/4503/1/parlasur/unasur.html>.

estimated. It was a captive market situation.

For the treatment of HIV, Darunavir was a product that was about to lose its patent in Chile and its acquisition price was USD 7⁴⁰ per tablet; but as a result of negotiations, the product ended up being priced at USD 1.2 per tablet and was obtained from a generic company in India that participates in the Strategic Fund mechanism of the PAHO mentioned above, which makes low-priced medications available for countries. This mechanism is similar to the PAHO's Revolving Fund where vaccines are provided for regional immunization programs. Thus begins the process for acquiring Darunavir at USD 1.2 through CENABAST, a situation following which the company holding the registration of Darunavir, whose patent has expired, filed a claim with the General Comptroller's Office requiring reports from the Ministry of Health, the ISP, Cenabast and even OPS Chile. Finally, the ruling establishes that there is no illegality in purchasing management through the OPS Strategic Fund (General Comptroller's Office, 2018).

In the negotiation for Hepatitis C treatment, Interferon and Ribavirin were included as procedures under GES⁴¹ (Explicit Guarantees on Healthcare) but did not yield good results. However, advanced generation treatments that completely cured the disease and prevented progression to cirrhosis or transplantation were already available worldwide. That is why they were chosen for negotiation. This new family of drugs called Direct-Acting Antivirals or DAAs are based on Sofosbuvir and are combined with other drugs from the same DAA family to exert their action. The initial market price for Sofosbuvir treatment was USD 84,000; during negotiations it could be obtained for USD 30,000. Nevertheless, it was an unaffordable price even for wealthy countries who found themselves facing unreachable access situations for the first time ever. Representatives from negotiating countries, accompanied by the PAHO, met with the companies and managed to obtain Sofosbuvir treatment for USD 7,800. Though a price reduction for other DAAs was not possible. This example shows the impact of patents on prices.

Compulsory licensing for Chile?

An important and historic health event originated in March 2017 when Innovarte Corporation⁴², along with some parliamentarians and patient

⁴⁰ The price is expressed in dollars to standardize values among all countries (Editor's note).

⁴¹ Explicit Health Guarantees. More information at: <http://www.supersalud.gob.cl/difusion/665/w3-propertyvalue-1962.html>.

⁴² Organization website: <https://www.corporacioninnovarte.org/>.

groups, requested that the Ministry of Health issue a Declaration of Public Health Need for certain medications, including the Sofosbuvir mentioned earlier. This declaration would establish the required conditions for issuing a compulsory license or patent break in case of a health emergency to access treatments for Hepatitis C, which was being discussed in many countries. The Ministry of Health, together with other ministries, had to address this request not only from a health perspective but also from legal and political standpoints. There were strong health arguments. However, authorities were indecisive due to the pressure exerted against them by private sector areas as well as some public sector areas.

The process was long and complex and lasted almost a year. It involved the formation of an interministerial working team, international coordination and a request that needed resolution before the new administration took office in the government change in March 2018. Thus, on March 9th, 2018, Resolution No. 399 of the Ministry of Health was enacted, declaring reasons related to public health to justify the pronouncement on granting non-voluntary licenses related to patent rights affecting Sofosbuvir and any associations it has with other Direct-Acting Antivirals (Gobierno de Chile, 2018). This process is still ongoing. There is a declaration of public health need but no progress has been made towards nullification of the said patents at the INAPI (National Institute Of Industrial Property). Nevertheless, a proposal has been generated amending Industrial Property Law on compulsory licenses under Drug Law 2.

The process of the Declaration of Public Health Need was a significant health milestone that was welcomed by countries in the region, and its media impact was crucial for initiating the update of the GES Decree incorporating DAAs for Hepatitis C treatment. Surprisingly, reactions came from the international pharmaceutical industry and several embassies where headquarters of these companies are located, as detailed in an investigation conducted by CIPER, a Chilean press outlet, in an article titled “Aggressive lobbying by laboratories against the resolution that lowers drug’s million-dollar price” (Sepúlveda, 2018).

This is how the GES decree was updated by incorporating Sofosbuvir as a base medication along with other DAAs for the treatment of Hepatitis C. Several alternatives depended on the different genotypes of patients, with some of the included medications with extremely high prices because companies withdrew from negotiations. Once the GES Decree (Gobierno de Chile, 2017) was issued in February 2018, the company with which Sofosbuvir was negotiated registered a pharmaceutical product in Chile consisting of a pan-genotypic association. This means that it could treat all types of patients with Hepatitis C without distinction.

Considering that the Decree included alternatives ranging from USD

7,800 to USD 26,000 and that the Declaration process was underway, the environment was suitable for a new price review. Therefore, companies holding these registrations were called upon to present new price offers. Some offered minimal discounts and the company that offered Sofosbuvir at USD 7,800 maintained that price and offered the new pan genotypic DAA combination at USD 5,100 per treatment, well below of the price that had been achieved in joint negotiations. The magnitude of this discount justified before authorities a rapid modification of the recently issued GES Decree (Gobierno de Chile, 2018a). We can say that this time success was achieved by both State and patients.

During the current pandemic period, discussion about health rights and access to patented medicines in case of health emergencies has resurfaced. In October 2020, India and South Africa submitted a petition to the WTO requesting flexibility on the TRIPS Agreement specifically regarding prevention, treatment and containment measures for Covid-19.

In Chile, the Innovarte Corporation along with other civil society organizations like the Drugs for Neglected Diseases Initiative (DNDI) and the College Of Pharmaceutical Chemists Of Chile presented a request to government urging them to take an active leadership role in the global fight against Covid-19 by expressing support for this proposal; however, the government has not yet made a statement. To the surprise of the world, in May 2021 the US President Joe Biden joined the proposal by expressing his support to relax the TRIPS Agreement. Part of the European Union and Russia have also expressed their support and Brazil is considering it, which has generated an international citizen movement called “Release The Patents” to pressure countries and companies.

When analyzing some real situations regarding the impact of patents on access to medicines, we reaffirm the quote that “the pharmaceutical industry has developed multiple ways to try to exploit the patent system and obtain greater benefits than its nature demands. The list of instruments used is vast and ranges from political pressure to design and imposition of laws, through extensive interpretation of traditional patentability requirements.” (Arellano & Tobar, 2012). We can then conclude that trade agreements have only favored the industry and developed countries, while regional integration agreements and health collaboration agreements have allowed States to negotiate jointly for better access to quality medicines for all people, regardless of their socioeconomic level.

Recently in Chile, actions related to access to medicines have been taken as local collaborative initiatives rather than coming from the central level, and defense of health as a right has mainly arisen from civil society organizations. Finally, it has been the citizen demonstrations that contributed towards generating constitutional change that could finally

enshrine health as a right.

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18. Health Diplomacy: Report of an Ongoing Research Project

Jorge Ramírez Flores

The definitions of various concepts, including Global Health Diplomacy, are continuously evolving due to the expanding nature of the areas covered under the global health perspective. The Covid-19 pandemic, which has spanned more than two years, has unexpectedly contributed to the development and study of diplomatic tools in health. This period has served as an accelerated natural experiment and has providing empirical tests of various theories that have emerged over recent decades on processes in Global Health Diplomacy (Solimano et al., 2021).

Elements such as surveillance and epidemiological alertness, the dynamics of medical device markets (e.g., ventilators), disruptions in cross-border flows, the development and financing of new vaccines as well as their global distribution, and the significant impact of the pandemic on national economies have all thrust health and international relations into the global spotlight with an intensity not seen since the world wars. While lessons are being learned on a weekly basis, many will require years to fully comprehend.

This article aims to provide a synthesis of the recent emergence of the Global Health Diplomacy concept in international discourse and literature. It will also discuss key findings from a multi-country project to better understand this field from perspectives rooted in the Global South. Lastly, the article will outline some challenges that our country faces, which we believe are relevant for medium-term consideration.

Essential Concepts in Global Health Diplomacy

Until recently, diplomatic texts largely overlooked health and often relegated it to the realm of humanitarian concerns (Drager & Fidler, 2007). However, the end of the first decade of the 21st century witnessed the emergence of the term “Global Health Diplomacy” (Kickbusch et al., 2007) that prompts a more systematic examination of the interactions between states, international organizations, non-governmental organizations and civil society in the realm of global health. This concept highlights a tension between addressing global health challenges directly and using health-related motivations or processes as means to achieve broader political, social, or economic objectives (Smith & Irwin, 2016).

Prior to the Covid-19 pandemic, several regional and global health crises, such as the Severe Acute Respiratory Syndrome (SARS) outbreak in

2003, the Ebola epidemic in 2014, the Zika virus outbreak in 2015, as well as ongoing challenges like the HIV/AIDS pandemic since the 1980s and the H1N1 influenza pandemic in 2009 underscored the potential threats posed by infectious diseases to national security, economic stability and political interests (Khazatzadeh-Mahani et al., 2020). The international community's response to these crises, including reforms to the International Health Regulations and initiatives for international cooperation, has been scrutinized by researchers due to the potential negative impacts of some of these measures (Fidler & Drager, 2006; Owen & Roberts, 2005; Ruckert et al., 2017).

The relationship between international politics and health can be understood through four general dynamics. First, foreign policy decisions can inadvertently harm population health, as evidenced by certain regional trade agreements that create access barriers for essential medicines in vulnerable countries in order to protect economic interests.

Second, health is often used as a tool in international politics, like in Development Assistance (DA), where wealthier countries use aid to advance their own strategic interests and values rather than solely promoting better health outcomes in developing countries.

Third, foreign policy can also be used to advance health objectives. While there is no consensus that health should be a singular objective of foreign policy, some countries have incorporated health considerations into their foreign policy decisions and recognize the interdependence of health outcomes between nations.

Fourth, health can be integrated into a comprehensive international policy framework. The increasing focus on aid, the negative impact of unfair trade agreements on health indicators and concerns over sanitary issues related to national security (e.g., migration policies) reflect a paradigm shift towards including health considerations in foreign policy.

The complexity of Global Health Diplomacy is further exemplified by the networked structure of international organizations currently addressing the Covid-19 pandemic. A detailed examination of the organizational landscape within these institutions can be found in a recent publication highlighting the intricate nature of this field (Haring, 2021).

Understanding the implicit and explicit motivations behind Global Health Diplomacy, as well as analyzing the discourses and actions of different governments in this context, is crucial. An innovative study in which we participated sheds light on these questions from the perspective of a South American country.

Key Findings from a Multi-Country Study: The Chilean Perspective on Global Health Diplomacy

To address these inquiries, a study was initiated in 2016 with technical guidance and funding from the University of Ottawa⁴³ with participation of researchers from Chile, Canada, Brazil and Mexico. By employing a qualitative methodology that encompassed document analysis and interviews with key stakeholders, each country aimed to delineate the prevailing dynamics of Global Health Diplomacy by encompassing explicit discourse and implicit elements from official documents and diplomats' interpretations. While some scientific publications have already emerged at both individual country levels (Guerra et al., 2021; Proulx et al., 2017; Ramírez et al., 2018) and collectively (Ruckert et al., 2021), others are still in progress. Data collection and initial analyses were conducted before the onset of the Covid-19 pandemic.

In Chile, a narrative literature review (Ramírez et al., 2018) concluded, albeit in a broad sense due to the limited number of articles on the topic, that health actions in international relations are “primarily motivated by more traditional foreign policy interests rather than a desire to meet health needs per se”. Nevertheless, there are indications that solidarity and consideration for health have gained greater prominence within diplomatic objectives, particularly in relation to South-South cooperation initiatives in which Chile has been involved.

These initial insights were further explored through an analysis of related grey literature⁴⁴, affirming the tendency to frame health issues within international politics as part of the national security sphere, especially in the analysis of international trade agreements involving Chile. Moreover, the prevalence of neoliberal economic aspects throughout foreign policy, specifically in health matters, is notable and likely serves as the primary motivation behind diplomatic actions in health.

However, certain specific elements hint at the abandonment of traditional modes of operation in international health relations. Regional integration (or South-South collaboration), interaction with international institutions from a human rights perspective and efforts to prioritize health considerations over commercial interests are notable in this regard.

⁴³ Grant number 136927 “Canadian Institutes of Health Research”.

⁴⁴ Some of these findings are incorporated in the Preliminary Work Report from the Chilean team's review of grey literature. Together with the analysis of interviews, they will contribute to future academic publications.

Regional integration has been prioritized, with Chile's participation in subregional initiatives like Unasur over neocolonial economic relations with countries like the United States. Unasur seeks to amplify the representation of regional countries in global health diplomacy processes involving commercial aspects. Similarly, Chile has bolstered its regional influence by collaborating with other countries to address public health threats and provide financial support for emergency response and disaster relief.

Within this context of regional integration, Chile has received assistance from international actors, primarily the World Health Organization (WHO), to address significant public health issues such as non-communicable diseases like tobacco consumption or mental health. The International Organization for Migration and other United Nations system organizations have also provided technical support for policy formulation and implementation regarding the growing migration phenomenon within the country.

It is intriguing that these instances of interaction with regional countries are largely grounded on human rights principles, an approach that has garnered public support since Chile's return to democracy in 1990. Unasur views health as essentially a human rights issue, focused on improving access to medicines, population safety measures and poverty eradication. International guidelines and WHO advisory capacity when collaborating with the Chilean government are also framed as issues related to these fundamental rights. Likewise, the migration issue in Chile has been considered as a human rights matter, since the lack of comprehensive policies has hindered immigrants' access to healthcare. The need for immigration reform that considers immigrant rights has been supported by various international treaties signed by Chile, which has it a political priority for several years.

Establishing the full right to health in Chile has been challenging due to previous political structures⁴⁵, however, there is a tradition of policies focused on public health, though traditionally subject to economic or commercial considerations. Governments have endeavored to reduce the incidence of cardiovascular diseases, for example, through food labeling laws. This initiative faced significant criticism from other countries through the World Trade Organization but has also been internationally praised as a legislative achievement in the fight against obesity. Despite the expected opposition from the food and beverage industry in Chile, the law was ultimately implemented⁴⁶.

⁴⁵ This situation may have evolved during the recent failed constitutional process, initiated in response to the social unrest and subsequent bipartisan political agreement in late 2019. The proposed draft was rejected by the Chilean population in September 2022, thus signaling a potential shift in circumstances.

⁴⁶ The reception of the law in terms of health assessment has been largely positive. This is evidenced by

Another example along these lines is the effort to reduce high tobacco consumption. Recent legislative restrictions have been based on the Framework Convention on Tobacco Control (FCTC), where the WHO and the PAHO have played a significant role in advocating for tobacco control measures to reduce the associated disease burden, despite known obstacles posed by the international industry to influence local authorities.

A pertinent perspective is offered by actors involved in Chile's Global Health Diplomacy⁴⁷. While their interpretations inevitably carry a degree of subjectivity, they provide valuable depth to this evolving scientific field. In general, there are no major contradictions regarding conclusions drawn from written sources, particularly regarding the novelty at the intersection of diplomacy and health or the evident tension between commercial and health aspects. However, new elements emerge that are worth highlighting.

Chile's participation in the international arena regarding health-related matters is viewed as an area of frank development and expansion. For example, involvement in the United Nations' Sustainable Development Goals initiative is frequently cited. Although Chile participates in multilateral development initiatives (PAHO, OECD, UNAIDS, APEC, Pacific Alliance, Mercosur, Celac, etc.), there seems to be a consensus that the country does not take a leadership role by presenting new ideas for such efforts.

Regarding the implementation of Global Health initiatives, it is noteworthy that no formal or systematic processes have been identified for placing health issues on the Chilean agenda. These issues can be driven by international organizations like the WHO/PAHO, countries referenced by Chile or a real national need. Many diplomatic processes associated with Global Health have risen, as expected, in emergency contexts (SARS, H1N1 Influenza, and Ebola)⁴⁸. When analyzing the long list of circumstances

several studies and reports that highlight its benefits. For instance:

- Reyes, M., Smith Taillie, L., Popkin, B., Kanter, R., Vandevijvere, S. & Corvalán, C. (2020). Changes in the amount of nutrient of packaged foods and beverages after the initial implementation of the Chilean Law of Food Labelling and Advertising: A nonexperimental prospective study. *PLoS Medicine*, 17(7), e1003220.
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⁴⁷ Part of these findings are included in the preliminary report of the analysis of interviews with key informants and will be part of future academic publications.

⁴⁸ Undoubtedly, the work related to the current Covid-19 pandemic in the last two years has significantly influenced the landscape of Global Health Diplomacy

declared as barriers to implementing Global Health Diplomacy in the country, the absence of real coordination between the Ministry of Health and the Ministry of Foreign Affairs is striking.

It is essential to highlight that, due to various methodological and feasibility reasons, most key actors interviewed belonged to the public or state sector. While diplomatic activity is essentially a State task and health priorities should also emanate from this sector, a notable narrative finding was the observation of power struggles among institutions and stakeholders with influence on these issues, like the industry and civil society, to impose agendas on various health topics.

Future scenario

The results of the discussed study provide an empirical foundation for an initial approach to the concept of Health Diplomacy. The perspective from a high-income country, situated in a region that experiences many of the typical challenges of the Global South or “underdevelopment”, can offer valuable lessons to the global community. As Chile navigates through an ongoing constituent process and a significant shift in the political landscape, its Global Health Diplomacy is poised to gain greater relevance in an uncertain scenario.

Epidemiological surveillance, vaccine management and addressing the economic impact of Covid-19 in the context of significant migratory flows are examples where international health-focused activity will become a crucial pillar of Chilean foreign policy. While there has been a perception of competitive eagerness among Latin American countries in managing the pandemic, the emergence of recurring variants underscores the need for collaborative efforts, particularly in ensuring equitable access to immunization across regions and countries.

The failed drafting of a potential new constitution in Chile raises key issues such as the Right to Health and retrospective respect for international treaties signed by the country, including trade agreements. This places diplomacy as a highly relevant tool in navigating definitions regarding access to healthcare for migrant populations, sustainable development and production models, while respecting environmental and cultural aspects in dealing with foreign investments.

In South America, the influence of conservative governments in recent years has resulted in a hiatus in one of the region’s integrative efforts, Unasur, with attempts to replace it with another structure called Prosur. However, despite ideological affinity among its members, Prosur has not

achieved significant traction. This regional instability, coupled with the linking of important institutions in each country to the evolution of the contingent political cycle at national level, undermines efforts towards South-South cooperation, and is a recipe for permanent failure. The new government in Chile (2022), at least in its discourse, has openly declared itself Latin Americanist and it remains to be seen how this aspect of international relations will enable the prioritization of urgent health issues.

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19. Public Health and Civil Protection in the face of risks of global potential

Alberto Maturana Palacios

Introduction

When dealing with such a challenging and interesting topic as global emergencies and disasters, the last century was undeniably the most catastrophic humanity has ever known. A century that witnessed world wars, nuclear emergencies, a fierce population increase, the first signs of climate change and the rapid development of artificial intelligence (AI) (Bostrom, 2016) could only leave us with an enormous set of challenges for the 21st century. Unfortunately, the first twenty years of this century have not been particularly generous in providing signals or indications that allow us to be optimistic. On the contrary, doubts about the future of humankind loom. As renowned historian Eric Hobsbawm stated at the end of his “The Age Of Extremes: The Short Twentieth Century”: “What I have written so far cannot tell us whether humanity is capable of solving its problems at this millennium’s end or how it can do so” (p. 493) (Hobsbawm, 2014).

This previous judgment is quite discouraging indeed. However, it does not prevent us from recognizing and valuing some commendable efforts that have been made to establish international instances that allow countries around the globe to face certain emergencies in a coordinated and effective manner, emergencies that concern all inhabitants as members of one single global community.

One such early effort can be traced back to European cities coming together to assist Lisbon after its devastating earthquake in 1755 (Revet, 2011:541). Similar initiatives took place following Caracas’ earthquake in 1812 (Revet, 2011). However, these types of aid originated from occasional good judgment and sense of community exhibited by some countries. It was not until the twentieth century when catastrophes led these responses to crystallize within supranational multilateral institutions. Events such as the Messina earthquake (1908), World War I (1914-1918), World War II (1939-1945), the Cold War and the constant threat of “mutually assured destruction” (MAD) due to atomic bombs, floods and cyclones in East Pakistan (1970), the First Gulf War (1990-1991) (Revet, 2011), among many other natural, war-related and social disasters, accelerated the creation of international networks for risk management, humanitarian aid, NGOs and citizen organizations that “clearly saw what many rulers wanted to deny”, as stated by Raúl Sohr (Sohr, 2001:48).

For example, in 1984, Dr. Frank Press⁴⁹, a notable American seismologist urged the global scientific community to make a collective effort to create a worldwide seismic network. Along with 25 other experts, Press was invited by the United Nations for preparing a report that would detail the project called “International Decade for Natural Disaster Reduction” (IDNDR) (Revet, 2011:542). This report served as the direct precedent for formulating the Tokyo Declaration in 1989 (Revet ,2011), followed by a resolution⁵⁰ signed by 156 countries at the United Nations decreeing that this decade would begin on the last decade of the millennium (Revet, 2011:542). As mentioned before, these attempts to institutionalize global risk management represent sparks of hope within an extremely uncertain scenario which has recently been further strained by the SARS-CoV-2 pandemic.

What has motivated institutional responses like Dr. Press’? What have these responses been? What objectives have they set and what level of achievement do they show? And perhaps the most unsettling question of all: Can we consider these instances sufficient to face anthropogenic or naturally occurring disasters? These questions will be addressed throughout this work. To do so, (1) we will examine some events that can be classified as disasters, (2) we will refer to the impact and damage they caused, (3) we will delve into the international response these disasters prompted and, finally, (4) we will outline a conclusion regarding the sufficiency or insufficiency of these responses in light of the global challenge they pose.

Disasters: A preamble

The literature on disasters is very extensive, as is the list of emergencies and catastrophes that have taken place throughout history. Seismologist Lucy Jones, in a suggestive book, has traced the history of disasters from the eruption of Mount Vesuvius in Pompeii (79 AD) to the present day, showing how each of these disasters shaped our world and civilizational progress⁵¹. In other words, disasters have accompanied us since the dawn of humanity.

Another point worth noting is that, year after year, phenomena

⁴⁹ Frank Press was a notable American geophysicist, scientific advisor to Presidents Kennedy, Johnson, Nixon, and Carter, and three-time president of the United States National Academy of Sciences.

⁵⁰ Resolution 44/236 of December 1989.

⁵¹ For an insightful historical study of the disasters that have changed the world, I recommend Lucy Jones’ book: “Desastres. Cómo las grandes catástrofes moldean nuestra historia” (2021, Editorial Capitán Swing).

classified as disasters are increasing. While technological development has greatly contributed to human control over nature, in many cases it has been precisely these advances in technology that have not only caused disasters to occur but also made them more destructive and detrimental to a greater number of people. An eloquent example is the construction and development of megalopolises with a huge population (a phenomenon that renowned art historian Ernst Gombrich referred to as the main catastrophe of the 20th century). There are qualitative differences between a disaster affecting a small rural community and one affecting Tokyo (with 30 million inhabitants), which impact factors such as severity, number of victims, geographical extent, collapse of health and emergency services, as well as damage both tangible and intangible. According to estimates by Swiss Re Institute, natural disasters that occurred in 2020 resulted in costs amounting to USD 83 billion, making it one of the most expensive years for industry since 1970⁵².

Thus, as pointed out by eminent American political scientist Patrick Deneen, “we have become accustomed to arguing that we must follow science on issues such as climate change while ignoring that our crisis is the result of a long chain of scientific-technical triumphs where following science meant progressing civilization.” Philosopher Michael Sandel seems to agree with this view. He harshly criticizes American elites for approaching challenges like climate change strictly from a technocratic perspective while evading the problems that technology itself has introduced, as well as its ethical and moral implications.

In summary, our analysis can be approached from numerous angles and perspectives. However, given the limited length of our work, we have chosen to analyze five events: 1) Bhopal Disaster, 2) Seveso Disaster, 3) Kobe Earthquake, 4) Indian Ocean Earthquake and Tsunami and, finally, 5) Hurricane Mitch.

All these cases started as local emergencies but soon surpassed the capacities of local authorities. This led to progressive disaster scenarios, catastrophes and sometimes cataclysms. Before going into our case studies, we need to briefly define each of these different scenarios to better understand the phenomena under study.

An emergency is defined as a severe disruption or interruption of normal conditions in a human community. It is caused by a (current or imminent) event that requires immediate response from state institutions, local authorities and media (Maturana, 2011: 549).

⁵² See the following link: <https://www.swissre.com/media/news-releases/nr-20201215-sigma-full-year-2020-preliminary-natcat-loss-estimates.html>.

A disaster is an emergency that exceeds the response capacity of a community and requires assistance from higher levels of the emergency legal-administrative framework (Maturana, 2011).

A catastrophe occurs when disasters cause the collapse of essential services or institutions for the quality of life of a community. Examples include the Mexico City earthquake (1985), the Kobe earthquake (1995) and the Eje Cafetero earthquake in Armenia Colombia (1999) (Maturana, 2011).

A cataclysm refers to the destruction of a large part of a specific biotope extending to ecological systems. A recent example is the earthquake in Chile on February 27th, 2010 that showed characteristics of cataclysm along its coastal areas due to the tsunami that devastated lives, homes, vessels and vulnerable structures in high-impact zones (Maturana, 2011).

Lastly, the events and emergencies with disastrous characteristics were selected based on various criteria such as number of fatalities, socioeconomic impact and geographical extent. However, the most relevant common criterion for their selection was the global responses these events provoked, which manifested in the form of multilateral actions, specialized agencies, special funds for mitigation and prevention, worldwide conferences and high-level academic research centers among others.

Case Analysis

Bhopal Disaster

On the night of December 2-3, 1984, in the region of Bhopal (India), a leak of methyl isocyanate occurred in a pesticide industry owned by Union Carbide (USA) and the Indian government. The toxic cloud (composed of various highly lethal gases such as phosgene, methylamine, caustic soda and hydrogen cyanide) ran downhill at ground level and suffocated thousands of residents as well as local flora and fauna. It was a true nightmare: suffocation, fainting spells and hemorrhages without the affected individuals knowing what was happening or why. The death toll exceeded 25,000 victims and over 500,000 people suffered from skin and eye injuries (Varma & Varma, 2005).

Numerous investigations and reports (Eckerman, 2005) established that the accident occurred due to a lack of preventive maintenance at the industrial plant: the cooling system and gas catalyst were deactivated for operational savings during holidays. Even three decades after the incident occurred the contaminating effects still persist. But what can we say about its effects on global emergency progress?

First, on December 3rd, the World Day for NO Use of Pesticides was declared. Its establishment has contributed to generating greater international awareness about indiscriminate use of these substances. Moreover, the tragedy led to the creation of institutions for healing and assisting victims and their descendants. Many present malformations and genetic damage. For example, “The Bhopal Medical Appeal” makes various donations to organizations such as the Chingari Rehabilitation Center (which provides medical assistance to affected Indian children) or the Sambhavna clinic.

Finally, more globally, the fateful disaster served, according to some authors, as a catalyst for improving international legislation on safety management and prevention of chemical accidents (Kahn, 2007). Even international labor legislation could be improved as International Labor Organization Convention No. 174 configured a new typology of disaster, the so-called “Major Accident”, in order to provide greater protection for workers and vulnerable populations working or residing near industrial plants (Uriel, 2019).

Seveso Disaster

In July 1976, at a small chemical plant in the municipality of Seveso (Italy), located 25 km from the city of Milan, a fire broke out that caused the release of significant volumes of TCDD dioxin. This is considered by experts as one of the most lethal substances known and is one of the components of “Agent Orange”, widely used in the Vietnam War by the US army (Kletz, 2001:103-109). It was also used as an inhibitor in massive forest fires and has only recently ceased to be used in Chile and many other countries.

The fire, attributable to human error, resulted in a toxic cloud over 5 kilometers in diameter, but the collective panic it generated was likely the most difficult factor to manage. The uncontrolled reaction of the population rendered existing safety procedures completely irrelevant since they were not designed to deal with an event like this (Kletz, 1998).

What consequences did this disaster have in terms of damage? First, no direct human mortality was associated with the toxic event. The most common injuries were chloracne caused by dioxin. The community had to sacrifice over 80,000 birds and poultry to prevent dioxin from entering the food chain. Finally, scientific publications up until 2009 show increases in cancer incidence rates in the province (Bertazzi et al., 2001; Eskenazi et al., 2004).

Now then, what were its effects on global health? As we mentioned earlier, the uncontrollable collective panic was the most difficult component to manage and made it clear that there is a need to improve protocols for communicational management of emergencies and disasters. As a result, the most important globalizing effect was the response of the European Union, which developed the Seveso Directives⁵³, widely used in the industrial world. These regulations, especially the so-called “Directive III,” aim to have European countries identify potentially hazardous industrial areas and develop relevant procedures to mitigate and prevent harm to people and the environment. In summary, their objective is to establish a high standard of protection within the European Union.

Today, these safety standards are universally applied.

Kobe Earthquake

The Kobe earthquake (Japan) reached a magnitude of 6.9 on the moment magnitude scale. It happened on January 17th, 1995, in the southern part of the Hyōgo Prefecture and lasted for 20 seconds. The epicenter was located just 16 km below the surface, at the northern end of Awaji Island, 20 km away from the city of Kobe, which has a population of one and a half million inhabitants. This area is crossed by the Nojima fault, responsible for causing this earthquake (Kitamura et al., 1998).

Around 6,434 people are estimated to have lost their lives as a result of this earthquake. Since Kobe was the closest city to the epicenter and fracture zone, it experienced stronger shock waves that reached an intensity of XI degrees on the Mercalli scale. It has been Japan’s worst earthquake since the Great Kanto Earthquake in 1923, which claimed 140,000 lives (UNCRD, 1995).

Though Japan is one of the most advanced countries in seismic resistance technologies, this earthquake caused significant damage to public infrastructure like bridges, highways, railways and essential services. This damage can be explained by both shallow depth (only 16 kilometers) and proximity to its epicenter (20 kilometers).

The numerous fires that broke out in different neighborhoods further hindered and slowed down authorities’ response efforts.

What global consequences can be identified from this earthquake? Since 1995, this earthquake has been a permanent source of study to the

⁵³ See: Original Seveso Directive 82/501/EEC; Directive Seveso II 96/82/CE; Directive Seveso III 2012/18/UE.

point that Kobe has been the venue for world meetings conferences and seminars which have contributed to enrich the discussion around global challenges in managing earthquakes. Examples of this are the Hyogo Framework for Action 2005-2015 agreed on during the World Conference on Disaster Reduction held in Kobe and the Sendai Framework for Disaster Risk Reduction 2015-2030.

The latter international instrument aims to increase the resilience of nations through the adoption of seven global objectives, like each state being responsible for preventing and reducing disaster risk, the need for shared responsibility between central governments and authorities, disaster management requiring the commitment of society as a whole and, most importantly, the urgency of an effective and meaningful global alliance and greater strengthening of international cooperation (United Nations, 2015: 13-14).

Thus, it is very clear how the Kobe earthquake contributed to crystallizing, internationally, efforts aimed at prevention and management of natural disasters.

Indian Ocean earthquake and tsunami

The Indian Ocean earthquake in 2004, known by the scientific community as the Sumatra-Andaman earthquake, was a devastating underwater event that occurred in late December 2004 with its epicenter off the coast of Banda Aceh. It is estimated that more than 227 thousand people died.

The earthquake originated in the Indian Ocean north of Simeulue Island on the western coast of northern Sumatra. The tsunami that was originated by this earthquake devastated coasts in Indonesia, Sri Lanka, India, Thailand and other countries with waves reaching up to 30m. It caused deaths and serious damage to the east coast of Africa as well. In total, eight people in South Africa died due to high sea levels. At the time, the Indian Ocean lacked a tsunami alert and warning system.

The earthquake triggered numerous tsunamis along the coasts of the Indian Ocean (Tsuchiya & Nobuo, 1995).

What were its global consequences? The World Conference on Disaster Reduction held in Kobe in January 2005 just one month after this devastating earthquake and tsunami agreed, among its multiple advances, to establish a center composed by the Pacific Tsunami Warning Center (US Geological Survey) and Japan's Tsunami Warning Center for monitoring and surveillance purposes regarding these phenomena occurring within the Indian Ocean (Tsuchiya & Nobuo, 1995).

Hurricane Mitch

Like many hurricanes, Hurricane Mitch originated in Africa as a tropical wave and entered the Atlantic Ocean on October 10th, 1998. Upon entering the Caribbean, it quickly developed into a tropical storm. To understand the catastrophe it caused, one only needs to read one of the headlines commemorating its occurrence after 20 years: “The hurricane that wiped out Central America” (Olmos,2018).

Hurricane Mitch has been one of the most powerful and deadly tropical cyclones seen in modern times. It reached speeds of up to 290 km/h and quickly reached the most destructive category on the Saffir-Simpson hurricane scale. The result? 15,000 deaths, 8,000 missing persons and 2 million refugees. Material damages amounted to 5 billion dollars (IDB, 2004). Furthermore, disease outbreaks occurred after its passage throughout Central America, including diseases like cholera, leptospirosis and dengue (IDB, 2004).

Now then, from an international perspective, Hurricane Mitch forced the Inter-American Development Bank to redefine its policies on extreme emergencies and global disasters: no less than 11 countries had fallen into default. On that occasion, the author of these pages was invited to propose a Disaster Network for the Bank, which quickly became a call addressed to all member countries. Thus, at the end of 2000, Chile presided over the Disaster Network, where global issues for disaster reduction were examined such as climate change, education, marginality and poverty (as well as other issues related to the bank’s credit policy, emergency funds and investment in prevention) (IDB, n.d.).

Final conclusions

This brief review shows countless examples of innovative efforts made by many individuals and expressed through new institutions, international collaboration, technological innovations, new standards and laws, transnational solutions and so on. All this aims to seek global approaches to solve health, environmental, technological and socioeconomic problems in a world that offers a range of extreme situations with varied causes and diverse scenarios.

Global health and disaster risk management share common strategies and challenges. Globalization is not an unattainable utopia. The current Covid-19 pandemic has demonstrated an unprecedented willingness and readiness of countries, regions and communities around the world to face this threat together and create the necessary vaccines to control and possibly eradicate the virus. Every day we are surprised by good and bad news that show contradictory aspects of a humanity that does not realize

that global threats can jeopardize human existence and sustainability of its only habitat: Earth.

Could this be our last chance and we still have not realized it?

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20. When data is not enough: Challenges and lessons for post-pandemic health communications

Mariela Ravanal Ponce, Claudia Lagos Lira, Ximena Póo Figueroa

Introduction

The pandemic is a warning of what may come (such as other pandemics or the destruction of the planet) if we do not respond with profound transformations; if, in the Anthropocene era, those of us with high responsibilities over our communities do not change our lifestyles.

Dr. Rosa Devés, rector of the University of Chile⁵⁴

Communicating science is much more than publishing an article in a journal.
(León et al., 2022: 18).

For several years now, various studies have documented a sustained drop in trust among audiences and citizens towards the media in general and journalism in particular (Newman et al., 2022). This can have various reasons which depend on the context or specific crises. For example, in Chile, the social uprising in October 2019 increased social criticism towards media outlets, particularly television (Lagos, 2020). Trust in media and journalism only partially recovered during the early months of the pandemic. As an example, by May 2020, Chileans were watching about seven hours of television per day (CNTV, 2020a).

One significant element of this lack of trust is that media and journalists are perceived as part of local and/or global elites⁵⁵ who themselves face discredit, particularly political and economic elites. With local colors and flavors, the traditional institutions of liberal democracies have seen their prestige eroded. In Chile, different surveys show approval ratings for institutions like Congress or political parties barely reaching 10 points and in steady decline since democracy was restored in Chile in 1990. Trust in television only reaches 16 percent and radio stations do not exceed 50 percent of mentions (CEP, 2022).

Globally, some level of distrust and even contempt toward “technical knowledge” or “experts” is also evident (Kakutani, 2019; Waisbord, 2021). In

⁵⁴ Award ceremony “Recognition for the communication of scientific evidence during the pandemic”. Public Health Institute (ISP) and Millennium Institute in Immunology and Immunotherapy (IMI), August 4th, 2022. Available at: <https://www.youtube.com/watch?v=1Fp1Ab64jP0> (Retrieved on August 5th, 2022).

⁵⁵ News anchors have been part of big advertising campaigns for big retailers and other corporations. News anchors are hired, also, under more privileged contracts than the rest of the media workforce (Carmona, 2016; Contreras, 2021; Ramos & Guzmán, 2013)

science, different phenomena or events (historical or conjunctural) have undermined its power. For example, manipulation and even abuse towards marginalized populations and the collective memory of such abuses kept them distant or suspicious of mass public health policies, including vaccination campaigns. Experiments like the Tuskegee study on African Americans in the United States (Breed, 2022; CDC, 2021), academic extractivism and its contribution to suspicion about the role of science, the fear of undocumented migrants being deported due to stricter immigration policies over the past decade worldwide and structural inequalities and discrimination based on race, ethnicity, gender and class undermine trust in authorities in general and health and scientific systems and policies in particular.

These phenomena are compounded by growing movements such as anti-vaccination groups (Deer, 2020) or climate change denial (Samantray & Pin, 2019; Schraer & Devlin, 2021), which shape an ecosystem that affects communication strategies in health. The proliferation and circulation of misinformation or misleading information amplified by the speed and reach of social media further makes it even more complicated to address the intersections between communications and global health, as well as designing effective strategies aimed at ensuring comprehensive health for individuals.

What we present here is not an exhaustive state-of-the-art analysis of the elements that play a significant role in shaping a communication landscape from which we can think and weave communication strategies in health. It depicts the context in which the pandemic Covid-19 unfolded and the communication challenges that arose from it, with a particular focus on the Chilean context.

This article reviews some key dimensions in the field of communications in general, and health communications in particular. It critically explores the challenges we identified during specific conjunctures of communication and its main players: professional production (particularly from media outlets and journalism) and their relationship with audiences (with an emphasis on those who faced the crisis while being more vulnerable).

Reporting on the pandemic

Demanding definitive answers from scientists and science journalists is to not understand science.

Sven Stockrahm, Science Editor at Zeit Online
(Blau, 2021).

One of the first reporters, if not the first, who referred to Covid-19 in Chile, Alejandra Matus (2020), in March 2020 published an article in *The Clinic* calling for attention to the advance of Covid-19, whose first cases had been reported in China and Italy⁵⁶ since January 2020. The reporter said not to minimize its severity and to get prepared based on the evidence that was gradually accumulating, especially in Asia and Europe (Kupferschmidt & Cohen, 2020; Sheahan & Frieman, 2020). The article was published on March 2nd, 2020, before the first case was reported in the country⁵⁷, before Chilean authorities declared a health alert, and a severe lockdown and suspension of classes, and weeks before the first death was reported⁵⁸. Matus called for vigilance before the World Health Organization (WHO) declared Covid-19 a global pandemic on March 11th.

It is not that the journalist or *The Clinic* knew something that other relevant actors did not know; but they paid attention to signs that were appearing in those early months when the crisis seemed distant in time and geography. The front pages of national newspapers give a glimpse into what was on their agenda those early days of March 2020 and what was relatively secondary or at least not newsworthy by then regarding a virus that seemed confined to China or Europe. *Las Últimas Noticias* (LUN) featured “How isolation at home will be for Chilean patients with coronavirus” on its front page on March 4th, followed by “Chilean scientist designs candidate vaccine against coronavirus” on March 5th. Only on March 11th, LUN had another front-page story reporting on quarantines for travelers entering Chile from countries under a health emergency, such as Italy or Spain, and where the first infected individuals had arrived. *El Mercurio*, in turn, included some international news about the new virus on its front page on March 3rd, like the quarantine of passengers on a cruise ship in Asia⁵⁹, the possible cancellation of that year’s Olympic Games, measures taken by the European Union to “face the crisis”, and timid controls at Santiago International Airport⁶⁰. During those days, and with the declaration of a health emergency by the government⁶¹, media coverage began shyly overlapping with politics and crisis management.

⁵⁶ Unexplained cases of pneumonia were reported in Wuhan, China, associated with a seafood market, which was closed on January 1st, 2020 (WHO-China, 2021).

⁵⁷ The next day, March 3rd, 2020. “Ministry of Health confirms the first case of coronavirus in Chile”. Available at: <https://www.minsal.cl/ministerio-de-salud-confirma-primer-caso-de-coronavirus-en-chile/> (Retrieved on August 6th, 2022).

⁵⁸ “Fallece la primera persona por coronavirus en Chile”, *La Tercera*, March 21st, 2022.

⁵⁹ “Coronavirus: The evacuation of the Diamond Princess cruise ship, the ‘dangerous’ place with the most infection cases outside of China”, *BBC Mundo*, February 17th, 2020.

⁶⁰ By mid-March 2020, there were already two cruises in Chile or that had passed through the country declared under quarantine due to positive cases among their passengers. *France 24*, March 14th, 2020.

⁶¹ Resolution No. 325, Ministry of Health, Chile, March 7th, 2020.

The informative reports during those first weeks were cautious and still confusing. Journalists and media workers acknowledged certain caution when covering a pandemic. “We did not even agree on how to write the name of the virus. In some media outlets they referred to it as ‘the Chinese virus’⁶²” and disregarded recommendations not to associate viral diseases with specific nationalities as this triggers discrimination and xenophobia, as experience and history have shown (Holt et al., 2022).

Caution or sometimes confusion in delivering and producing information from different players was a characteristic feature of those early weeks. The dissimilar or even opposed nature between scientific research and news production conspired to generate more fluid information processes. As Daniel Silva, a Chilean journalist specializing in science and technology, rightly says⁶³: “The time frame for science differs greatly from that of the media”⁶⁴. Indeed, while the press deals with a 24/7 news cycle that requires accurate urgent responses, the scientific community can take years to establish the origin and initial infection paths for a new disease⁶⁵. As journalist Francisco Aravena highlights⁶⁶, “Something that became evident during this pandemic is how scientific knowledge is always under construction. How we start knowing very little or nothing at all before gradually deciphering it day by day.”⁶⁷.

Indeed, *Spillover* (Quammen, 2012) seems like a chronicle of what was to come. The book shows how difficult it is to determine how, when and why a virus from non-human living beings infects humans, what the vector is, what the pattern of contagion or its rate of reproduction is and, above all, how much - which is a lot - remains unknown about viruses. Quammen extensively reports on cases such as hendra, Ebola, SARS and AIDS, but doubts (which outnumber certainties) also apply to Covid-19 and the viruses that came and will come. Thus, the need to face this health crisis has led society to demand accurate information from science “despite the fact that often there is only uncertainty” (León et al., 2022: 6).

⁶² Foreign correspondent based in Santiago de Chile. Personal communication, August 7th, 2022.

⁶³ Host of “Planeta Futuro” on Mega TV channel and “La ciencia del futuro” podcast on online radio TXS+ (<https://txsplus.com/ciencia-del-futuro/>).

⁶⁴ Ceremony “Recognition for Communication...”, ISP and IMII, August 4th, 2022.

⁶⁵ “From Wuhan to Paris to Milan, the search for ‘patient zero’”, The Washington Post, July 7th, 2021.

⁶⁶ Aravena hosts the radio show “Aire Fresco” (<https://www.duna.cl/programas/aire-fresco/>) in radio station Duna in which scientists are interviewed. During the pandemic, the radio show maintained the podcast “Coronavirus al día”, covering data on infections, measures for resuming school, progress and improvement in development, production and distribution of vaccines.

⁶⁷ Ceremony “Recognition for Communication...”, ISP and IMII, August 4th, 2022.

An uncertain scenario like the one generated by a pandemic is fertile ground in the field of communications to activate phenomena like misinformation or disinformation, information fatigue, ethical challenges in covering phenomena and processes that involve both health and life or death of people, as well as the need to deploy narrative strategies that contribute to a better understanding of the crisis considering all its dimensions (health, political and social, economic or intimate).

Infodemic

Even if we say something in good faith, there is a machinery that extracts small pieces in communication to craft falsehoods. We must be aware of the ecosystem where we navigate.

Francisco Aravena, editor and producer, Copesa⁶⁸

At the beginning of 2020, the Director-General of the World Health Organization (WHO), Dr. Tedros Adhanom Ghebreyesus stated that “we are not just fighting an epidemic; we are fighting an infodemic. Fake news spreads faster and more easily than this virus and is equally dangerous.”. Ghebreyesus then assured that the WHO was working with major global telecommunications companies “to counteract rumors and misinformation”.⁶⁹

The WHO has defined infodemic as an overabundance of news - some accurate; some not so much - which makes it difficult for people to find reliable sources to make decisions about what to do in this health crisis context (PAHO & WHO, 2020; WHO, n. d.). However, it is important to mention that “infodemic” is not a concept developed or established in social sciences before 2020. Some press accounts mention terms such as “information epidemic” or “informative epidemic”, i.e., mixing a few facts with fear speculation and rumor amplified by communication technologies (Nielsen et al., 2020).

Literature refers to informational pathologies or informative disorders (Wardle & Derakhshan 2017 cited in León et al., 2022). There is consensus in distinguishing three categories depending on their intentionality: *misinformation* (false information published without the intention to harm others), *disinformation* (intentionally misleading and affecting institutions or

⁶⁸ Ceremony “Recognition for Communication...”, ISP and IMII, August 4th, 2022.

⁶⁹ Munich Security Conference, February 15th, 2020. Available at: <https://www.who.int/director-general/speeches/detail/munich-security-conference> (Retrieved on August 8th, 2022).

individuals) and *malinformation* (correct information that should not be disseminated for ethical reasons) (Ireton & Posetti 2018; Turcilo & Obrenovic 2020 cited by León et al., 2022).

Different authors have proposed typologies to specify the category of disinformation: satire or parody, confusing content, impostor content, fabricated content as well as three types of procedures to produce this type of content: establishing false connections, false context or manipulated context. Other authors distinguish between those seeking to generate traffic through exaggerated headlines or spectacular images (click baits), conspiracy theories, fake content, sources or contents that promote different forms of discrimination, junk science and rumors (Carrasco-Farré, 2022).

In its most harmful forms, disinformation has consequences. For example, in a less serious scenario, it can fuel skepticism towards any type of public message including reliable ones. In the worst cases, it can encourage behavior that may be dangerous for people and communities. False or misleading contents are usually easier to cognitively process (Carrasco-Farré, 2022) and emotions play a decisive role in whether people accept and incorporate false or misleading contents. Finally, the effectiveness of dismantling disinformation or falsehoods (cutting off their circuit) or countering them when they are already spread have dissimilar results (Ecker et al., 2022).

This scenario of informational disorder (or informative pathologies) did not originate with Covid-19. In scientific fields subjects such as tobacco use, global warming or the impact of heavy metals on human health have been influenced by propaganda, manipulative information and disinformation even from players within the scientific and technological community. Electoral campaigns and social crises have also been fertile grounds for producing and spreading false and deceptive contents aimed at deliberately misinforming.

Likewise, fact-checking is a practice that did not originate with journalistic coverage on science or the virus. Ideally, it is understood as a constitutive part of journalistic practices (“if your mother says she loves you, fact-check it”). In terms of its application different US media outlets (like *Rolling Stone* or *The New Yorker*) developed fact-checking processes and created specialized teams dedicated to fact-checking since the 1960s. In the 1990s, such practice spread to some Latin American magazines like *Gatopardo* (Mexico), *Etiqueta Negra* (Peru) and *El Malpensante* (Colombia). The field of statements by political authorities is the most classic in which fact-checking has been developed in international and local media⁷⁰.

⁷⁰ One of the most influential models is the American PolitiFact.com, which was created in 2007 to specifically cover the elections of that year and it remains active today.

Amid a digital and multimedia ecology, this practice has extended to researching and verifying material circulating in digital environments. The Covid-19 pandemic triggered media outlets to reactivate, or create, fact-checking units for content related to the pandemic. In the Ibero-American context, the most critical areas described by previous research are the origin, spread and lethality of the virus, as well as the best practices on health-care, and how both local officials and international organizations managed the pandemic (Ramon-Vegas et al., 2020).

In the Chilean experience, the social uprising of October 2019 fostered an ecology of organizations dedicated to fact-checking (independent, university-based or media-based⁷¹). Although not all survived in the months after the uprising (Martínez, n. d.; Núñez-Mussa, 2019), some regained prominence during the pandemic. In fact, at the beginning of 2021, they founded the Association of Fact-Checkers in Chile (Varela, 2021).

Those who work on fact-checking do not have the capacity to verify every piece of disinformation or deceptive information that circulates on different platforms and mediums, including instant messaging applications. It is very difficult to dismantle or undo a false or misleading content once it has gone viral (Carrasco-Farré, 2022). Therefore, professional fact-checkers necessarily need to focus their resources and make decisions for editorial approaches on what to pay attention to and, therefore, which contents to check.

It has also been shown that the impact on the virality of malicious or false content depends on whether those who spread it are high-profile individuals or public figures. In other words, a false or out-of-context text/video/tweet generates more traffic if shared by an influencer or politician than if it comes from an unknown source (Simon et al., 2020). Global collaborative work has been crucial in identifying hoaxes/disinformation/malicious information in Covid-19 coverage and how these have evolved across different mediums⁷².

⁷¹ Some examples are #24Data by TVN, fact-checking by La Tercera, Fast Check, factchecking.cl, Mala Espina and Watchdog, among other initiatives that emerged and remained during the toughest months of news coverage on the pandemic. They addressed only issues related to Covid-19 or have a broader agenda. They publish with varying regularity and address statements made by public figures or check whether viral content is real or manipulated.

⁷² Like the International Fact-Checking Network (IFCN) that brings together over a hundred organizations of different sizes and located in different parts of the world and contributes to identifying and verifying the accuracy of content about Covid-19. Available at: <https://www.poynter.org/coronavirusfactsalliance/> (Retrieved on August 6th, 2022). In the Latin American case, it is possible to consult a database of checked content on this platform: <https://chequeado.com/latamcoronavirus/>. (Retrieved on August 6th, 2022). In Latin America, the platform <https://chequeado.com/latamcoronavirus/> is a database about fact-checked content (Retrieved on August 6th, 2022).

The majority of respondents in a study conducted in six countries stated that news media helped them understand the crisis and explain what they could do individually and collectively. However, one out of three also feels that media exaggerated about the pandemic. Additionally, respondents answered factual questions about coronavirus correctly overall. In four out of six countries surveyed people who used news media as sources answered correctly at higher rates than those who did not (Nielsen et al., 2020). Clearly, the variable of whether a person consumes news media or not does not fully explain their behavior or decisions regarding the pandemic; it depends on context, political attitudes, religious beliefs and years of formal education.

Recognizing that information disorder exists and developing and implementing strategies to counteract it are necessary actions, but insufficient. The experience during the pandemic indicates that these “information pathologies” are likely to repeat themselves in future crises. However, the journalistic and media fields and the scientific field have become more aware and have strengthened their ties in everyday work.

Publishing data is not the same as communicating

Scientists and journalists need to understand that a newspaper or media outlet is not a scientific journal. I do not have ten pages to publish about coronavirus.

Camila Figueroa, journalist at *Las Últimas Noticias*⁷³.

One positive aspect of the pandemic is that there has been a significant volume of scientific information in the media. Concepts such as virus, antibodies, vaccines and immunity became headlines. There has also been an important effort to popularize complex scientific concepts in a way that is accessible to massive audiences. However, this seems like the tip of an iceberg and, with over 7,000 scientific articles published daily, most of them will go unnoticed (León et al., 2022).

Through the experience of reporting on science in general and covering the pandemic in particular we learn about various strategies that brought information and data about the pandemic closer to people. The pandemic posed a challenge not only for journalists, but especially for those who were not part of specialized science and technology sections. “With the

⁷³ Ceremony “Recognition for Communication...”, ISP and IMII, August 4th, 2022.

pandemic, scientists learned how to communicate”, says Camila Figueroa. “Scientists have become much more open towards talking to journalists who may not necessarily be part of their fields; they have realized how important communication is”, Daniel Silva highlights.

One strategy was building narratives that contributed to public trust in science. “Writing about genetics or the structure of the coronavirus is very different. But if you put a face to the Oxford vaccine volunteers who were part of phase 3 of the clinical studies, it is very important for building trust in vaccines”. For example (Figueroa, 2020), featuring on the front page the first healthcare worker receiving their first dose of the vaccine (LUN, December 25th, 2020) or a close-up of an elderly man smiling on LUN’s front page under the headline “Full of Life” (February 4th, 2021). “Putting a face to vaccination”, Figueroa emphasizes, “brings science closer to people.”

By May 2020, data, figures and infection and death curves were not enough to sensitize and humanize the crisis. Some media outlets dedicated their covers to those who had died until then by printing lists with full names (*The New York Times* and *O’Globo*, for instance) or their portraits (Sábado magazine from *El Mercurio*).

In the effort to humanize and tell the real-life stories of the virus, journalism also deployed reporting strategies and narratives where the reporter was also the one telling and starring in the story in first person, as a way to connecting to their audiences: whether it was volunteering in vaccine studies (Greco, 2021) or their testimony as a hospitalized patient in a critical unit due to Covid-19 complications (Salaberry, 2021).

The effort to find the human side of the news that triggers empathy in audiences, the rush to be first but not necessarily better or more accurate and analyze more intimate and painful moments and places of the characters in news stories (like hospitals, private homes or funerals) implies challenges from an ethical perspective of journalistic practices. How much emotion, music and post-production features are necessary in a broadcasting report about the pandemic or whether false expectations will be generated from a study in its early stages of animal testing are some of the fundamental ethical questions that journalists must ask themselves before publishing.

“A cure is always found for something that has no cure”, says Francisco Aravena. “It suffices to think for a second before speaking or writing or publishing.” In a digital ecosystem that thrives on who has more traffic, there is a risk that “editors seek more clicks on the internet or higher ratings and then *somehow a cure for something appears or an asteroid will graze Earth*; content that plays on the edge”, explains Daniel Silva. Harassing patient zero can have concrete impacts on their private life and

privacy rights in terms of health information, employment status and integration (or isolation) within their community (Riquelme, 2021).

Another risk is over information or information fatigue. As María Pastora Sandoval, a reporter from Radio Meridional de Punta Arenas, says⁷⁴: “People no longer listen to that murmur (put your mask on).”⁷⁵ Fatigue has been reported among audiences due to massive coverage almost exclusively related to coronavirus issues. In other words, the pandemic took over all sections and different areas of content production and journalism: basic information about confinement measures, vaccination, infection rates, hospitalizations and deaths; as well as the direct or secondary impact on different dimensions of community life, from unemployment or care crisis to remote education or the impact on cultural production and consumption.

Lessons for communicating about and for vulnerable communities

The Covid-19 pandemic has been particularly devastating in Latin America in terms of health, but also in its social, economic, cultural and political dimensions. In this context we need to ask how to communicate when it comes to naming people in vulnerable situations, whether they are protagonists of scientific, health-related or political information or not or when defining them as audiences of mediated messages.

As to how we communicate about these populations and/or groups, it is essential to deeply think about how imaginaries are constructed around experiences like poverty, marginalized migration, LGBTQIA+ population and even subjects at various stages of the life cycle considered “non-productive” (childhood, youth and the elderly). This construction increases gaps of access, stigmas, discriminatory patterns and institutional prejudices anchored in everyday subjectivities when built without a human rights-based approach.

In other words, the intersectional perspective (Valdivia, 2022) contributes to sexism, racism and classism that violate human rights both within neighborhoods and within official apparatuses, with all their nuances, and produce individuals who embody the deepest fears of a population afraid of the unknown. The multiplicity of combinations resulting from these elements turns into messages fueled by media outlets and other institutions that rely on emotion (fear against hope) and make it fertile ground to link all those populations with the pandemic, i.e., meaning

⁷⁴ <https://meridionalradio.cl/>.

⁷⁵ Ceremony “Recognition for Communication...”, ISP and IMII, August 4th, 2022.

disease and death, as seen in Chile. Thus, the symbolic image of an infected *Other* was strongly established especially at the beginning of the pandemic cycle.

Regarding how to better communicate with diverse populations/groups, several organizations (especially the government in all its levels, including public universities) have deployed ambiguous messages, focusing on data or in a style of communicating that simplify informing, but at the same time neglecting the complexities of audiences that are diverse. Such confusing messages then circulate in local health clinics, schools and media and have been found to trigger confusion if scientific evidence does not consider different contexts to effectively communicate (Labrín et al., 2020). For example, to obtain information, the Haitian population has had to rely on grassroots organizations and communication efforts carried by the University of Chile and other institutions. Something similar has been experienced by individuals infected with HIV, children and teenagers. For communities like those, communication efforts have focused on educational communities and schools, but have weakly addressed other aspects related to quality of life. A similar approach we can see in aging and the pandemic.

In that sense, these two areas of the same problem should and are suggested to work on diversifying sources and permanently work with grassroots and social organizations in order to understand their actual needs and their specific ways of communicating, by articulating media networks that allow for direct messages based on a scientific perspective, but also anchored in a care-oriented approach (CNTV, 2020b; Posetti & Bontcheva, 2020). The human rights-based approach becomes essential, considering that it involves violated populations and/or collectives who require communicational support to overcome their situation by their own means, without patronizing them, but with timely, effective, efficient, contextual-appropriated information enabling them to make decisions and resist and respond to hate speech, stigmas, racism, sexism and classism. The *Other* is an “Us” and constructing it as *Otherness* only widens the gaps between communication and the community.

Final notes

What paths does communication follow in terms of what it is about (what), how it unfolds (how), when it occurs (when), who it reaches (whom) and why? These questions do not find simple answers in this chapter. On the contrary, in line with other dimensions of disciplinary scholar production, as well as inter- and transdisciplinary ones, the experiences in reporting on the pandemic and its consequences, the implementation of human rights-based communication strategies and campaigns from public institutions,

like the University of Chile, and the particular attention to diverse audiences and publics targeted by these messages show the challenges communication represents in the field of global health.

These dimensions are fundamental because, as discussed in this chapter, it does not suffice to share data or produce science-based information or evidence. Perception of risk, for instance, determines how people respond to crises (Glik, 2007). Therefore, it is crucial to deeply think about and learn from critical experiences, like those mentioned here and face the future in the fields of science, the environment, the use of technology and the role of communications within them.

As science and technology journalist Daniel Silva says, “new pandemics will come” and we also face “climate and water crises, which are challenges for scientific journalism”. The collaborative scenario opened by the Covid-19 pandemic has fostered a certain democratization of access to and circulation of science. In part, because access to information coverage and scientific dissemination about the course of the pandemic and the search undertaken to better understand the origin, development and impact of the virus was released⁷⁶ (Besançon et al., 2021). However, the right to access to health information is still lacking, as demonstrated by the fact that the Ministry of Health and its dependent offices are among those who most frequently apply information silence in response to requests for access to information⁷⁷.

Despite high-quality research about informational disorders, disinformation, misinformation and malinformation are in good health. As this chapter has shown, such phenomena fuel a strident media ecosystem that does not always contribute to human well-being.

Interdisciplinary and transdisciplinary collaboration is required, as demonstrated by the pandemic. We hope that this trend will be further deepened in the future. Practitioners and experts in science, technology, scholars, media, journalism and communications in their broadest and most diverse facets have begun to weave networks, to share knowledge and practices and to find common languages to address the crisis, but we think they need to go deeper and sophisticate their efforts.

Ethical challenges in sciences and communications are acute. Material with recommendations and suggestions on how to better cover the

⁷⁶ As in the cases of journals and magazines like *Science*, *Nature* or the *National Geographic*, as well as Chilean news outlets.

⁷⁷ “FOIA requested by CIPER: The delivery of emails from high-ranking officials of the Ministry of Health during the pandemic has begun.”, Nicolás Sepúlveda, CIPER, June 8th, 2022.

pandemic⁷⁸ was produced. Workshops and trainings were held for journalists and institutional media workers, as well as meetings with an emphasis on learning communities and valuation of good practices. Many of these approaches were normative; some were pragmatic as to which sources were more appropriate or what approaches should be avoided (sensationalist or alarmist) and which should be promoted (stories of improvement and overcoming), as well as emphasizing solutions in the stories told by journalism. The fact that journalists, communicators and media workers were considered critical workers and received their first doses of vaccination early in the process in Chile⁷⁹ and in other countries, symbolizes the relevance they have in building more and better connected discourses and communities.

Both good and not so good experiences derived from the fields of communication, health and science during the pandemic should be considered to rethink the intersections of these areas in relation to other pressing scientific and technological issues, such as climate change and artificial intelligence. As discussed in climate change studies, neither scientific actors nor the evidence produced by research are the factors that drive social consensus. Meaningful changes require political actors and communication strategies, to mention just two relevant aspects, to push for substantive changes (Holmes, 2020).

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⁷⁸ "How journalists can help stop the spread of the coronavirus outbreak", Eduardo Suárez, Reuters Institute, March 2020. Available at: <https://reutersinstitute.politics.ox.ac.uk/news/how-journalists-can-help-stop-spread-coronavirus-outbreak> (Retrieved on August 6th, 2022). The WHO itself has generated content aimed at improving communications in the field of health, taking also into account different audiences. "WHO compilation of innovative concepts to communicate science during the Covid-19 pandemic". Available at: <https://www.who.int/teams/epi-win/scicom-compilation> (Retrieved on August 6th, 2022). "Apuntes para las coberturas sobre la pandemia Covid-19", Defensoría del Público de Argentina, March 19th, 2020. Available at: <https://defensadelpublico.gob.ar/recomendaciones-para-la-cobertura-de-la-pandemia-covid-19/> (Retrieved on August 7th, 2022). In the Chilean case, the National Television Council also developed recommendations for developing a more careful media coverage of the pandemic (CNTV, 2020b).

⁷⁹ "The Guild of Journalists requested to the Ministry of Health Covid-19's vaccines and PCR tests for media workers.", January 2021. Available at: <https://www.colegiodeperiodistas.cl/2021/01/colegio-de-periodistas-solicito-al.html> (Retrieved on August 8th, 2022).

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Epilogue

The goal of this book is to update Global Health themes over the past 10 years, with a predominantly academic and Latin American perspective, in a current scenario dominated by the appearance of Covid-19 at the beginning of 2020.

The conceptualization and relevance of Global Health have been enriched in our region especially thanks to the work of a group of prestigious Public Health schools and institutes, successful Latin American congresses, participation in global events and a set of publications with limited global impact written in Spanish. Universities in the Latin American region have carried out joined efforts with national and international organization and civil society organizations and made valuable contributions to increase knowledge, monitoring and evaluation due to pandemic and non-pandemic diseases. They also have involved communities directly. In this context, the field of Global Health has acquired its own identity and broad recognition. However, what has been achieved does not seem sufficient, given the different responses from countries to their internal health crises or the lack of collective response during the pandemic period, which makes it necessary, more than ever, to identify existing challenges and ways to address them.

Currently and in the future, Global Health issues must be understood analytically within our new models for development. This understanding should encompass not only social, economic and cultural aspects but also innovation in Public Health itself. This implies profound structural changes across practically all dimensions of human activities. This means generating an understanding of diverse causes responsible for these problems globally, including health-related ones. Interdisciplinary approaches as well as inter-institutional collaboration at local, national and international levels constitute an imperative that needs to be strengthened. Undoubtedly academia has much to learn while processing such knowledge before transmitting it effectively among various stakeholders.

Global Health gained even greater relevance with the emergence and development of the Covid-19 pandemic. In this scenario significant scientific advancements made in recent years have contributed to reducing the pandemic's impact, and there is no doubt that we will witness new important achievements in this field in the future. Moreover, it has become evident that we were not prepared or responded too late, which should not happen again when facing potential threats of similar global impact.

Likewise, timely and efficient decision-making will continue to be a domain requiring analysis and changes to facilitate effective and prompt actions. This implies, among other things, updating different types and

systems of governance to address these new realities. It does not matter how crises are faced: doing so collaboratively will always be better than doing it alone.

The topics covered in this volume aim to provide updates and future perspectives, according to the views of authors specialized in the subjects discussed. Therefore, in this epilogue, it seems important and illustrative to highlight the central concepts and messages covered in this volume.

The first part of the book addresses general aspects of Global Health. From a Latin American perspective, a profound critique is presented regarding the hegemonic knowledge and practice concerning Global Health, illustrated with some examples. Furthermore, the process of globalization and the particular interests of central countries are discussed, making the governance of global health institutions relatively obsolete, particularly that of the WHO. Despite this, some collaborative efforts between countries and institutions are described, with emphasis on the Americas region. Similarly, the impact of inequality and limited socioeconomic development associated with Global Health is analyzed. It is also evident that education in this field is still incipient in Latin America as it adopts characteristics specific to practicing countries. This highlights a difference from historical stereotypes prevailing among universities in more developed countries, which establishes a marked distinction between global North and South regions. Finally, the relationship between economic development and health level is contextualized through different historical stages experienced in Latin America with special focus on Chile's healthcare system.

The second part focuses on environmental risk factors. Globalization, inequality and weak economic growth generate pressures on the environment. Six specific environmental problems affecting human health are analyzed with approaches that have yielded diverse results from a Global Health perspective. The definition of biodiversity is further explored along with attempts to understand it from theory while preserving it through concerted government action. Furthermore, the main definitions related to climate change and global warming are discussed alongside their key mechanisms as well as a historical perspective on global initiatives within Latin America and specifically Chile, aimed at addressing their causes and consequences.

A group of major health problems are examined in the third part. In terms of communicable diseases, it is confirmed that vulnerable populations are disproportionately affected, and epidemiological surveillance should have a more significant territorial component. In the prevention of non-communicable chronic diseases, the need to invest and intervene effectively in the population food environments is emphasized. Different models for

understanding mental health in the modern world are discussed, which criticize hegemonic practices and present medium-term challenges for diverse societies. This section concludes with an innovative global approach linking human health and animal health in order to address problems arising from zoonotic diseases, antimicrobial resistance, and food insecurity.

Health inequity is the central theme of the fourth section where selected issues are developed. Regarding migration and health, an interesting and differentiating perspective is presented as to essential public health functions and their relationship with the migratory process, prompting reflection on states' response to the current regional migration crisis as well as healthcare system adaptation to this new reality. In substance use, there is a need to shift from an outdated "war on drugs" approach towards a flexible public health perspective focused on individuals rather than substances. The development and obstacles in achieving sexual and reproductive rights throughout history provide elements for constructing effective rights in different countries with emphasis on Chile's ongoing constitutional process. Finally, in terms of social and cultural approaches toward the elderly, a paradigm shift at a global level is highlighted with particular focus on the concept of "active aging".

The last part of the book addresses organized societal responses to globalization-related problems. The pandemic has exposed weaknesses in healthcare systems, according to WHO parameters, but has also provided lessons for future health challenges. Regional or subregional initiatives concerning medicines and appropriate regulations are beneficial for public health. However, this is not always true for existing global intellectual property trade agreements. Additionally, the main findings of an international collaborative study on Global Health Diplomacy from a Chilean perspective are reported. This field remains relatively unexplored yet highly important. An analysis from a historical perspective explores how major disasters of various natures have contributed to shaping global initiatives aimed at improving their response. The section concludes with a review of the major problems and challenges that, particularly, the pandemic has posed in the vast field of health communication. This includes perspectives from multiple professional information producers as well as reception and adoption by diverse audiences, especially those who are more vulnerable.

Successfully addressing present and future challenges in our societies requires structural transformations across practically all areas of human endeavor. Consequently, new models of development are needed to directly and indirectly tackle numerous diverse health problems, including those of a global dimension.

We do not claim to be exhaustive, but our work at national, Latin American and global level should enable us to identify essential challenges

for inclusive and comprehensive improvement in population health and well-being. These challenges include maintaining and accelerating scientific and technological development, governance at both national and international levels, providing sufficient funding for healthcare systems, generating accurate and timely communications between institutions and the population, reducing territorial inequalities in health indicators and well-being and the indispensable role of individuals and citizenship today and as we look to the future.

There is no doubt that some important topics have remained unaddressed and that knowledge, approaches and governance in Global Health will continue to advance and improve. This book is understood to constitute a modest and valuable contribution to this ongoing progress.

The Editors

The School of Public Health 'Dr. Salvador Allende G.' at the University of Chile celebrates its 80th anniversary. Its Global Health Program was established in 2010 and has since engaged in growing academic activities both nationally and internationally. Currently, it comprises academics, former academics, and collaborators from different units of the University of Chile who teach, conduct research, and collaborate with national civil society organizations and various international institutions.

The Program is a founding member of the Latin American Alliance for Global Health (ALASAG) and is part of the World Federation of Academic Institutions for Global Health (WFAIGH), having held the presidency of both organizations in recent years.

Editing a book on global health is an ethical imperative given the current circumstances of contemporary society. The purpose of this publication is to communicate and expand knowledge in the field of global health to readers from both the health sector and other spheres of knowledge. It aims to provide a broad perspective that transcends disciplines.

The book is divided into sections covering the foundational theoretical aspects necessary for understanding the evolution of the concept of Global Health. It also analyzes organized social responses to global health issues. Topics include environmental health risks related to the globalization process, updates on diseases of special relevance in the global health landscape over recent decades, and specific socio-health issues that share significant inequities worldwide.

We hope this academic effort will be a valuable reference and enjoyable read for those involved in Global Health topics.

“In this field of ideological and scientific struggle, the present book on global health from the University of Chile introduces us to a new intellectual debate, reinforcing the concept of global health, more relevant than ever.”

ÁLVARO FRANCO

“...this new publication, which draws attention to the need for a transdisciplinary and critical understanding of the determinants of the political economy of global health, is a welcome addition to the fight for health.”

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