



Bridging the Gap in Global Health Education: Launching an Institute of Global Health Equity in Latin America

Citation

Carrasco, Héctor. 2020. Bridging the Gap in Global Health Education: Launching an Institute of Global Health Equity in Latin America. Doctoral dissertation, Harvard T.H. Chan School of Public Health.

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**BRIDGING THE GAP IN GLOBAL HEALTH EDUCATION:
LAUNCHING AN INSTITUTE OF GLOBAL HEALTH EQUITY
IN LATIN AMERICA**

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A Doctoral Thesis Submitted to the Faculty of
The Harvard T.H. Chan School of Public Health
in Partial Fulfillment of the Requirements
for the Degree of *Doctor of Public Health*
Harvard University
Boston, Massachusetts.

May 2020

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in Latin America**

ABSTRACT

Currently, there is a lack of global health education and research opportunities in low- and middle-income countries in comparison to high-income countries. There is a critical need to address this gap because of the current intractable health problems — like climate change, antibiotic resistance, noncommunicable diseases (NCDs) and infectious outbreaks — which disproportionately affect more poor people in any country, but especially those living in low- and middle-income countries (LMICs). These global health problems tend to be the result of complex and unprecedented global forces such as globalization, ageing populations, and capitalism that require creative, transdisciplinary, and trans-sectoral responses.

In response to these problems, “Global Health Education” (GHE) and “Global Health Research” (GHR) were developed as part of the global citizenship education movement. GHE and GHR aim to aid students in understanding global forces affecting their communities and encourage them to adopt a self-critical approach and use their agency to achieve equity and mitigate national and transnational risks through a health and research lens. However, while LMICs account for 84% of the world’s population, only 19% of the 195 affiliated global health institutions within the Consortium of Global Health Universities are located in LMICs. Likewise, only 10% of health-related research addresses problems faced by 90% of the world’s population – a phenomenon known as the 10/90 gap. Therefore, there is a need for more institutions promoting GHE and GHR in LMICs to equip local professionals with the tools they need to address global health challenges.

The purpose of this doctoral project was to address the gap in global health education and global health research in LMICs by generating the theoretical bases and momentum for launching an Institute of Global Health Equity (IESG in Spanish) in a well-renowned university in México, a middle-income country experiencing myriad global health challenges like NCDs, infectious outbreaks, and climate change effects and with only one formalized academic global health institution. The aims of this doctoral thesis were to:

1. Assess the internal and external conditions and forces that enable, restrict, or facilitate the creation of a global health institution in Latin America, with a focus on México.
2. Codify the strategy, structure, pedagogy, resources, and processes for the IESG.
3. Develop and implement a community organizing effort and strategic action plan for the IESG that resulted in a proof of concept.

To achieve these aims, I drew on a 10-month full-time immersion in my host institution as an academic professor, coordinator, and researcher. During my time there, I performed a critical analysis of the literature to assess the need and value of GHE and GHR, conducted qualitative research to explore and understand the perceptions of key stakeholders, interviewed and gathered advice from managers of other global health institutions, designed and taught global health courses, organized students and professors to convince the host institution leadership, and developed a summarized business plan for the IESG. This project is the first known in-depth application of research methods, full immersion and community organizing practices to create the basis to launch a global health institution in a LMIC. Furthermore, it provides a roadmap to advocates, students, professors or administrators interested in launching institutions to promote GHE and GHR in LMICs.

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ACKNOWLEDGMENTS

This work would not have been possible without the support and encouragement of my DELTA Committee Chair, Dean Erin Driver-Linn, whose commitment and support for my professional and personal development allowed me to reach greater heights and aspire even more boldly. Every time I set myself up for failure, your guidance was the ever-shining beacon of hope and counsel I needed throughout this journey to stay on track and achieve my seemingly lofty goals. To the DrPH Program Director Richard Siegrist, and Dr. Salmaan Keshavjee, your thoughtful and intentional advice as the other members of my DELTA Committee, were invaluable every step of the way. Richard, your accompaniment throughout all of the DELTA bureaucracy and procedures, as well as your continuous encouragement were critical to my completion of this project. Salmaan, your vast expertise that I so greatly admire and your ability to always bring me back to the bigger picture will always be treasured. To Beatrice Frain and Suchitra Narayan, who even in the busiest times always greeted me with patience and kindness keeping the train going and seamlessly coordinating all the necessary logistics, correspondence, and tasks necessary for me to reach my goals.

To my family, my parents Héctor Refugio Carrasco Uranga and Angelica Magallanes Hinostroza, and my sisters Alondra, Arilene, and Diana you are all crazy and inspiring in the best way possible. Thank you for always loving me unconditionally, for all your ridiculous jokes, your hard work, and for establishing in me the values I hold so dearly.

To the core team of Tec's Global Health Initiative. Daniel Bernal who envisioned the Institute of Global Health Equity more than two years ago and whose fierce commitment to global health equity and discipline for hard work never stops surprising me. To Alexia Rivera who welcomed me to Mexico City, and in the middle of hectic times at IMSS always found time to advance our projects. To Jeronimo Esquinca who tended to be the first one at the 7 am calls, always invested in new battles and offering new ideas to advance our goals. To Itzel Eguiluz whose enduring commitment for students'

development and gracious ability to multitask is admirable. To Sebastian Rodriguez who deliberate attention to the big picture and unique ability to add a chill touch to the most pressing times. To Valeria Macias whose unselfish and fierce battle for equity and justice defines solidarity. To Hugo Flores for embodying the values of global health and speaking with an unequivocal moral clarity what global health should be. To Dr. Guillermo Domínguez and Dr. Manuel Pérez who believed, encouraged and supported the Institute of Global Health Equity idea since its inception and mentored me on the field during my DELTA project making everything easier and more productive; your leadership, commitment to your mentees and friendship will be always highly regarded.

To the Tec's students: Fernando G, Rocio, Karen, Alejandro, Fernando C, Grecia, Adara, Ariel, Isabella, Mafer, Aracely, Marian, Carlos and many more who each day taught me the value of collaboration and hard work. In the middle of classes, exams, and clinical rotations, you always made time to lead and work on new projects. Your commitment to equity and justice is as inspiring as your desire for change. To Laura, whose unselfish commitment to students' growth and unmatched discipline for hard work will be always admired. To Alex, who always found a different angle to see day-to-day events, your capacity for introspection and always struck me. Those conversations during lunchtime will always be missed. To Israel and Sofía, Los del El Centro, whose commitment to global health equity and their incredible capacity to focus in detail was a true compliment to my efforts. To Steve Reifenberg, Joe Rhatigan, Daniel Palazuelos, Marshall Ganz, and Henry Perry, who always made time in their busy agendas to mentor me. Your fierce battle for equity and justice, and advice and guidance would be always highly regarded. To my peer coach Wen, who month to month encouraged me to keep going and offered me advice to sort things out. To Susan Madden and my dear friend Akshita Siddula, who served as my editors in chief, for their incredible support and honest feedback when my Spanglish shined sparingly.

To my dear friends Mercedes, Zulema, Enrique, Victor, Andrea, Casey, and all the CES team who have always been accompagnateurs in my ride for social change. Your support, trust, and encouragement, even in the hardest times, define friendship with spectacular clarity.

Finally, to the love of my life and partner of adventures, Stephanie Kang. Thank you for sharing this mission with me and for being the most incredible thought partner, my source of strength, and a continuous spring of joy in my life. You bring love, boldness, and intentionality to anything, and everything, I do.

KEY TERMS & DEFINITIONS

DELTA	Doctoral Engagement in Leadership and Translation for Action project
GCE	Global Citizenship Education
GHE	Global Health Education
GHR	Global Health Research
GHIs	Global Health Institutions
HICs	High Income Countries
IESG	Institute of Global Health Equity (acronym is for Spanish translation)
LMICs	Low- and Middle-Income Countries
NCDs	Noncommunicable Chronic Diseases
TGHI	Tec's Global Health Initiative

SECTION 1. INTRODUCTION

1. The Need for More Global Health Education and Research in Low- and Middle-Income Countries

Global health challenges, such as climate change, noncommunicable chronic diseases (NCDs), antibiotic resistance, rapid urbanization, and infectious outbreaks, disproportionately affect poor people in any country, especially the poor living in low- and middle-income countries (LMICs) given their limited capacity to prevent, respond, and recover (Madhav et al., 2017; Mccracken & Phillips, 2012). Often, these health challenges are the result of large-scale global forces such as globalization and neoliberalism and require comprehensive, multidisciplinary, and trans-sectoral responses. In an increasingly interconnected and interdependent world, there is a need for transformative pedagogy that enables students to resolve complex challenges that concern all humanity. Global Citizenship Education (GCE) has been proposed by The United Nations Educational, Scientific and Cultural Organization (UNESCO) — which is the specialized agency of the United Nations whose purpose is to promote international collaboration in education, sciences, and culture in order to increase universal respect for justice, the rule of law, and human rights — to create citizens in an interconnected and interdependent world (UNESCO, 2016). GCE provides students with critical thinking skills and a sense of belonging to a broader community and common humanity, promoting a “global gaze” that links the local to the global and the national to the international (UNESCO, 2016). By empowering learners to engage and assume active roles, both locally and globally, to face and resolve global challenges, GCE generates proactive contributors to a more healthy, peaceful, inclusive, secure, and sustainable world (Marshall, 2005).

Global Health Education (GHE) is part of the GCE movement with a particular focus on present and future health challenges. By bridging a broad range of academic disciplines to generate effective solutions and exposing health professionals in training to new pedagogies and models, such as

experiential learning and competencies-based education, GHE has reported many benefits over traditional training approaches such as better teamwork, better responsiveness to contextual factors that shape health, and better understanding of how health systems operate (Drain et al., 2007; Kraeker & Chandler, 2013). Similarly to GHE, Global Health Research (GHR) is concerned with producing meaningful knowledge to alleviate the health problems of underserved populations (Stephen & Daibes, 2010). A focus on global health equity — understanding the breadth of disparities of health outcomes in and between countries — is the core value of GHE and GHR (Farmer et al., 2004), and can serve as an influential tool in leveraging domestic and international resources to close the equity gaps everywhere, but especially in LMICs (Liu et al., 2015).

While global health challenges present a greater threat to LMICs than to upper-middle (UMCs) and high-income countries (HICs), due to their lower capacity and resources to prevent, respond and recover (World Economic Forum, 2019), of the 195 Global Health Institutions affiliated to the Consortium of Global Health Universities (CUGH), only 19% are located in LMICs. Although LMICs account for 84% of the world's population. The uneven distribution leaves many students without opportunities to receive GHE (Liu et al., 2015). Similarly, 80% of the global health publications (Zicker et al., 2019) and more than 90% of the global health textbooks published in Google books do not have authors from LMICs; both numbers suggest a lack of local capacity to perform GHR in these countries.

Latin America is a promising location for launching a global health institution that promotes GHE and GHR. While Latin America hosts 8.4% of the world population and is the most economically unequal region in the world (Hoffman & Centeno, 2003), it only has eleven Global Health Institutions (GHIs) that offer formal GHE and GHR academic programs. (Refer to Table 4 in the appendix so see a list of universities and programs they offer). Similar to the rest of the region, México is a country with vast resources, but also with high rates of poverty, disease, and low innovation in healthcare delivery (Levy, 2010; OECD, 2017). Considering México's unique geographical location that connects it with the

global north and its current role as a model for the rest of Latin America in areas such as democracy, economics and education, México has an unprecedented opportunity to lead the GHE and GHR movement in Latin America. Interest in launching a global health institution, has been expressed by leaders at the School of Medicine and Health Sciences at Tecnológico de Monterrey, one of the most reputable universities in Latin America and one of the largest in México.

2. Thesis Purpose and Sections

The purpose of my Doctoral project was to address the gap in global health education and global health research in LMICs by generating the theoretical and practical bases and momentum for launching an Institute of Global Health Equity (IESG in Spanish) at Tecnológico de Monterrey (Tec).

My DELTA Doctoral thesis examines the limitations of traditional health education, assesses the need for Global Health Education (GHE) and Global Health Research (GHR) in LMICs, and proposes a community organizing framework to create momentum to launch global health programs and global health institutions in universities in LMICs. Further, this paper examines the conditions necessary for establishing a global health institution in México and offers a business plan to do so. Lastly, it provides a pathway to launch similar institutions in other LMICs using community organizing practices.

The thesis contains two parts: an analytical platform and the results section. The analytical platform establishes the need for global health education in LMICs, highlights the benefits of global health education, calls attention to universities in LMICs to lead efforts in GHE and GHR, and sets the foundations for the DELTA project which consisted on a 10-month full immersion in my host institution as an academic professor, coordinator, and researcher. Based on a critical analysis of the literature, qualitative research, and my immersive experience, the results section presents the key conditions and enablers to the GHE and GHR movements and the best practices to launch global health institutions in

academic settings. Through this lens, I present an analysis of the institutional priorities and internal conditions at Tec to launch a Institute of Global Health Equity in Mexico and conclude by presenting the organizing practices followed during my DELTA project.

The discussion focuses on the lessons learned during my DELTA project, as well as the implications of the findings in this thesis for academic institutions and funders interested in advancing global health equity. Finally, it presents the first draft of a business plan for an Institute of Global Health Equity in México for the host organization (Tec de Monterrey).

Finally, the conclusion connects the findings with the central message of this thesis: there is an urgent need for expanding the GHE and GHR movements in LMICs to approach 21st-century health challenges successfully on a global scale.

SECTION 2. ANALYTICAL PLATFORM

The Analytical Platform describes the need for GHE and GHR programs in low- and middle-income countries (LMICs), particularly for health professionals, and describes the DELTA project in detail. It then describes the complexity of current health challenges and argues for the need of inter- and transdisciplinary approaches using México as an example. Next, it explores the issues with the current model of education for health professionals in terms of pedagogy and highlights the resulting narrow approaches to health. Then, it talks about the benefits of GHE and GHR and the capability of universities to expand these programs in LMICs. Finally, it describes the DELTA project design and methods.

1. The Need for More Global Health Education and Research in LMICs

In the past decades, the demand for GHE has grown dramatically in HICs due to three main factors: 1) a greater emphasis on internationalization in higher education; 2) heightened public visibility of the global health agenda such as the United Nations' Sustainable Development Goals or the World Health Organization's Universal Health Coverage by 2030 Project; and 3) the expansion of new resources and opportunities for universities and students (Drain et al., 2007; Merson & Chapman Page, Kimberly, 2009). Still, this growing demand is not being met, even in HICs. According to the American Association of Medical Colleges, while almost two-thirds of those entering the medical profession had planned to participate in a GHE experience, only one out of every three medical school graduates has participated in global health-related activities (Chase & Evert, 2011). Every year, thousands of students take global health courses and immersions that prepare them for an interdependent world and strengthen their commitment to global health equity. While the global health field emphasizes the need for global health practice in LMICs, the provision of global health education has historically been limited to HICs as these types of opportunities are not always available to students in LMICs.

Currently, the most active and notable alliance of Global Health Institutions (GHIs) around the globe is the Consortium of Universities for Global Health (CUGH). According to the CUGH website, the CUGH “supports academic institutions and partners to improve the wellbeing of people and the planet through education, research, service, and advocacy” (CUGH, 2020). Even though only 16% of the world population lives in HICs (WB, 2013), 80.5% of the CUGH’s 195-member institutions are located in HICs, while the remaining 19.5% are in LMICs (CUGH, 2020). The imbalance of geographical location for GHIs indicates that a significant portion of the world’s population does not have an institution promoting GHE in their own country. Subsequently, students in these countries might not receive the required training to effectively approach the effects of global health challenges. Some student-run organizations have highlighted this gap; for example, the International Federation of Medical Students, representing 1.2 million medical students from 123 countries, called for medical schools globally to ensure a comprehensive global health framework within their curriculum (IMFSA, 2010). It is important to note that the lack of representation of LMICs may not be entirely due to lack of GHIs in these countries, but that some institutions in LMICs might not be affiliated with CUGH. Yet, these differences are too significant to be explained by this possibility.

In addition to GHE, there is a need to strengthen the capacity to carry on Global Health Research (GHR) in LMICs. A significant amount of GHR focuses on the health of people living in LMICs and also on understanding systemic factors that shape health (Stephen & Daibes, 2010). Building capacity for GHR in LMICs would help to resolve the well-known 10/90 gap in the literature, which speaks to the fact that only 10% of health-related research addresses problems of 90% of the world’s population (CMAJ, 2004; Saxena et al., 2006). For example, examining the authorship of recent GHR publications suggests a significant imbalance between researchers from LMICs and HICs. From the 2,423 global health publications between 2008 and 2017, USA investigators co-authored 53.1% of publications, followed by the UK (18.0%), Canada (11.3%), Switzerland (5.8%) and Australia (5.0%).

Combined, authors from these five countries accounted for 88.2% of all publications indexed; while, LMIC authors were engaged in only 19.3% of the publications, representing 10.3% of first authors and 9.7% of the single author articles (Zicker et al., 2019). Similarly, of the 201 global health textbooks posted in Google books, 95.5% had the lead author affiliated with an institution located in a HIC. This suggests a lack of capacity for locally-driven research, and lack of a forum for discussion of global health issues outside of HICs.

An example of a university implementing a GHE and GHR centered program is the Duke Global Health Institute (DGHI). The DGHI utilizes an inter- and transdisciplinary global health education and research approach to respond to the global burden of disease, create a robust network of international partners, and provide academic opportunities for training undergraduates and health professionals (*Duke Global Health Institute, n.d.*). However, while they offer field research and immersion experiences in LMICs, this type of training is significantly different than a GHE and GHR curriculum being directly provided within an LMIC. For example, the master's program at BRAC James P Grant School of Public Health, in Bangladesh, attracts students from all over the world to be taught by a wide variety of faculty members from prestigious universities. The program is enriched by the many partnerships that the school has with local and global institutions in developed and developing countries, while providing direct community-based learning experiences and proximity to the health challenges and contextual factors that determine health outcome in LMICs. Still BRAC only has graduated slightly more than 300 MPH graduates since its program inception in 2005 (*BRAC James P Grant School of Public Health, n.d.*).

GHE and GHR require context-specific understanding and training given that manifestations of global health problems and their effects are culturally and geographically specific (Mukherjee, 2018; Withers et al., 2016). Increasing the number of local professionals with global health competencies is essential but the opportunity to do so is largely unavailable in LMICs, even as, according to CUGH,

collaborations between GHIs in LMICs and HICs are valuable given global interdependence and the need to exchange lessons and resources. Unfortunately, most of these partnerships are still quite unilateral in terms how they are established and utilized (Adams et al., 2016). These efforts cannot replace the need for a local cadre of people who are trained locally and able to contextually address the complex set of bio-social problems that shape public health and healthcare delivery in their own communities. Creating this local capacity for GHE and GHR will become critical for LMICS as global issues continue to grow.

1.1. Current global health challenges in LMICs

Current global health challenges like climate change, rapid urbanization, mental illness, disease outbreaks and many more disproportionately affect the poor in any country, and particularly for people living in LMICs (World Economic Forum, 2019).

Climate change now represents an existential threat to human civilization. For example, species abundance is down by 60% since 1970, and biodiversity loss is affecting health and socioeconomic development, with negative implications for well-being, productivity, and regional security (World Economic Forum, 2019). The evidence suggests that climate change tends to disproportionately affect people living in LMICs for three main reasons: 1) increased exposure to the adverse effects of climate change; 2) increased susceptibility to its effects; and 3) decreased ability to cope and recover from damage produced by climate change (Islam & Winkel, 2017).

Another threat is rapid urbanization which, along with globalization, has led to skyrocketing obesity rates in LMICs due to the westernization of diets and habits, including sedentary lifestyles, high-calorie diets, and less healthy foods (HSPH, 2012). In addition, rapid and inadequately planned urbanization in LMICs has contributed to poor air and water quality, excess mortality associated with the urban heat-island effect, increased motor vehicle and pedestrian injuries, and increased violent

crime (Campbell-Lendrum & Corvalán, 2007; McMichael & Beaglehole, 2000). This rapid urbanization is particularly damaging in the Latin American and Caribbean region, which is the most urbanized in the world, as reflected by the high number of megacities, large urban agglomerations of 10 million people or more (Ferreira et al., 2008; Jaitman, 2015). In addition, more than 70% of the burden of mental illnesses is located in LMICs, while the access gap — between those in need of treatment and those who have access to it — is almost 90% (Alloh et al., 2018).

Finally, the frequency of infectious disease outbreaks has been rising steadily. Between 1980 and 2013 there were 12,012 recorded outbreaks; however, fewer than 1,000 of these outbreaks occurred in 1980 compared with the more than 3,000 that occurred in 2010 (Smith et al., 2014). Proportionally speaking, most of these infectious disease outbreaks started in LMICs and had a greater impact on populations living in these countries (Madhav et al., 2017). All these challenges and many more – such as the expanding wealth gap, aging populations, and cyber-attacks — are the type of challenges new generations have to face.

Despite the significant amount of evidence on how to approach some of the challenges mentioned above, health systems — defined as all the organizations, institutions, and resources that are devoted to producing any effort whose primary purpose is to improve health (WHO, 2000) — are struggling to maintain and preserve health, and this is especially critical in LMICs (Jamison et al., 2013). México is an example of a health system struggling with new health challenges using antiquated approaches.

1.1.1 New Health Challenges, Old Approaches: The Mexican Case

México is a middle-income country, with 126 million inhabitants (INEGI, 2015), of which 42% live in poverty (Esquivel, 2015), and 70% suffer from food insecurity (INSP & INEGI, 2016). México has the second-highest prevalence of obesity in the world and the highest rates of diabetes, teenage

pregnancy, and children with chronic malnutrition among the Organization for Economic Co-operation and Development (OECD) countries (OECD, 2017). According to the OECD, 15.8% of the adult population in México suffers from diabetes mellitus, and 25.5% from high blood pressure (OECD, 2017). Additionally, out of the OECD countries, México invests the least in health, with only 6.7% of GDP spent on health expenditures (WB, 2016). Just over half (53%) of health expenditures are from public sources, while the other half is from private spending consisting largely of out-of-pocket expenditures (CIEP, 2018). Further, about 25% of the total health budget is used to treat complications of only two diseases: hypertension and diabetes mellitus (FUNSALUD, 2013). This panorama of poverty, food insecurity, chronic illnesses, and low investment in health with a consequent low performance of the health system are significant challenges for which México has not rendered relevant improvements in the past decades. And for many — if not all — of these pressing issues, México's health system is continuously attempting to tackle these challenges with approaches that tend to be fragmented, narrow, and poorly articulated (OECD, 2016).

México's health system stands as a notable example of an archaic, siloed structure trying to tackle contemporary health issues. In 1943, the Mexican health system was established with a segmented structure determined by job status (Dantés et al., 2011). Through these classifications, the two most important health institutions were created: the Mexican Institute of Social Security (IMSS in Spanish) and the Ministry of Health (SSA in Spanish). IMSS provides care to salaried workers and their families, while the SSA provides care to the unemployed, self-employed or people working in the informal economy (Dantés et al., 2011). These two programs still exist today, along with two new additions: the Mexican Civil Service Social Security and Services Institute (ISSSTE in Spanish), which provides care to federal workers, and the Mexican state-owned petroleum company, PEMEX, which provides care to its own employees. Each of these institutions have its own mechanisms of stewardship, financing, and provision of services which creates duplication of functions, waste

resources and generates poor accountability (Lozano & Garrido, 2015). The fragmentation of the Mexican health system has made it challenging to tackle domestic health issues due to the mass duplication of efforts, waste, inefficiencies, lack of coordinated care, and inability to provide a preventive healthcare system (Lozano & Garrido, 2015). However, these issues are not confined within the national borders; they are intertwined with global forces that lessen the success of any organized response. For instance, the rapid increase in the incidence rate of obesity in México is directly correlated with urbanization and the local manifestations of unregulated economic growth (Giuntella et al., 2018; HSPH, 2012). Therefore, health systems cannot continue tackling issues from narrow, provincial, and siloed perspectives. It is imperative that any approach for the training and education of health professionals, which includes physicians, nurses, midwives, and public health professionals, to be focused not only on narrow approaches to health, but also on broader contextual forces that influence health and healthcare delivery — health professionals' education needs an upgrade.

2. The Field of Global Health

The field of global health was born in response to the growing gap and complexity in health disparities across and within countries with the promise that every single person—no matter who they are or where they come from — should have the ability to lead a healthy and productive life (Packard, 2016). According to the CUGH, “global health is an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. Global health emphasizes transnational health issues, determinants, and solutions; involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration; and is a synthesis of population-based prevention with individual-level clinical care” (Koplan et al., 2009). The cornerstone of global health is equity, which is intentionally focused on structural change, and concentrates on social factors that prevent some individuals, groups or populations from attaining their greatest potential (Braveman & Gruskin, 2003). Addressing health with an explicit equity agenda is driven by a

recognition that minor reductions in mortality are insufficient to break the link between poverty and disease, and that transdisciplinary and multilevel changes are required.

Moreover, the concept of global health also emphasizes that healthcare delivery systems cannot be divorced from public health needs, and should be designed, structured and staffed adequately in order to preserve health and fulfill the needs of the people whom they intend to serve (Mukherjee, 2018). The global health definition also highlights that global health — as a collection of problems that require multi-faceted thinking — is a natural connector for disciplines and actors working inside and outside the health sector. Good health outcomes cannot be delivered by health systems or health professionals alone; integration and collaboration across all levels and disciplines are critical for the complexity of global health issues. In Appendix A can be found a brief summary of the history of global health and in Table 3, a comparison between tropical medicine, international health and global health.

2.1 The Benefits Of GHE In Approaching 21st Century Challenges

The Global Citizenship Education (GCE) movement is a form of civic learning that involves active participation by students in projects that address global issues of a social, political, economic, and environmental nature. The two main elements of GCE are “global consciousness,” which is the moral or ethical aspect of global issues, and “global competencies,” which are skills meant to enable students, and ultimately, graduates, to participate in changing and developing the world (Monaghan & Spreen, 2017). Moreover, GCE helps students to recognize and use their political agency toward effecting change and promoting social and environmental justice (Pashby, 2018). In addition to helping people understand their role and to mitigate global risks, GCE can support the institutions that allow for global governance in addressing those risks. For example, the Universal Declaration of Human Rights (UDHR) — which states that we must ensure that the universal rights of every man, woman,

and child are protected, including “the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, and medical care” (UN, 1948) — requires global citizens to act on its behalf. Likewise, in September 2015, the Sustainable Development Goals advocated for “ensuring healthy lives and promote well-being for all at all ages” (UN, 2015). Achieving the SDGs or fulfilling the promises of the UDHR requires the hard work, expert knowledge, and collaboration of global and transdisciplinary groups of individuals from all nations.

As part of the GCE movement, Global Health Education (GHE) is an area of training that focuses on training future generations to deal with complex health issues caused directly or indirectly by transnational factors (Battat et al., 2010; Kerry et al., 2011). In training future professionals, GHE bridges a broad range of academic disciplines, including anthropology, business, engineering, environmental sciences, economics, history, law, psychology, public policy, agriculture, and sociology with the health sciences (Koplan et al., 2009). By connecting and learning from other disciplines, GHE seeks to provide professionals with the necessary competencies and networks to address present and future health challenges from inter- and transdisciplinary perspectives instead of from traditionally narrow or hospital-centric approaches (Jogerst et al., 2015).

Global Health Education (GHE) has at least two features that make it uniquely suited to tackle current health issues: it is practice-oriented, and competency-based (Fineberg & Hunter, 2013; Fried et al., 2012; Jamison et al., 2013; Merson, 2014). The first feature, practice orientation (or experiential learning), is a core feature of GHE given that hands-on experiences give greater understanding of the causes and solutions to health challenges by creating opportunities so that students analyze how contextual factors affect health and by connecting them with communities and other professionals already implementing solutions to address health problems (Battat et al., 2010). The second, competency-based education (CBE), is a framework for designing and implementing education that focuses on the desired performance characteristics of professionals by establishing observable and

measurable performance metrics that learners must attain to be deemed competent (Gruppen et al., 2012). By intentionally training professionals accountable to societal needs (or other relevant principals) rather than focusing on memorization of facts, CBE has shown its benefits in terms of attitudes, communications skills, critical thinking, and problem-solving (Gruppen et al., 2012). According to CUGH, there are 11 main domains, such as ethics, global burden of disease, and health equity, and 37 competencies in the field of global health (Refer to Appendix A for a full list of domains and competencies).

CUGH considers there to be two levels of expertise in global health: the global citizen level; and the basic operational program-oriented level. Several domains comprise the competencies recommended for the global citizen level, which include students and professors from diverse disciplines. Other domains are recommended for the basic operational program-oriented level, which include policymakers, implementers and program directors. This set of domains provide students and professionals with the required competencies to effect change in their communities and countries (CUGH, 2015).

Some of the short- and long-term benefits reported by medical students from HICs who participated in GHE programs are: 1) a better understanding of the value of community-based care; 2) better sensitivity to cultural and socioeconomic factors that shape care-seeking behaviors; 3) more inclination towards a career working with the underserved; 4) a greater awareness of cultural competency; and 5) a sense of responsibility to improve health disparities (Chase & Evert, 2011).

Similarly, in a survey with 159 American physicians who participated in global health-related activities abroad, they reported: 1) a sense of improved patient rapport, particularly with low-income, refugee and immigrant patients; 2) reduced spending on healthcare services; 3) greater awareness of the social determinants of health; 4) more in-depth understanding of the USA's healthcare system compared with systems in other countries; and 5) a reinforcement of values that initially motivated

them to pursue work in global health (i.e., equity, justice, care) (Matthews-Trigg et al., 2019). There is less research on the impact of GHE programs on undergraduates; however, some authors claim the impact includes a better understanding of cultural differences, more empathy towards underserved populations, and an increased “sense of idealism” to tackle health disparities (Drain et al., 2017). Some authors are already talking about the need of these types of professionals. In the field of medicine, they are referred to as the “upstream doctors,” who are professionals with the necessary skills to effectively support, nurture, and promote inter- and transdisciplinary thinking and actions in offices and beyond their clinics. Further, upstream doctors are providers who can contribute to a large team in healing the acute problem, while looking upstream to address the “causes of the causes” (Manchanda, 2013).

LMICs need leaders who are versatile and transdisciplinary thinkers able to work toward finding solutions to global health challenges as well as informed citizens who are aware of these health risks and of the way in which their own actions can minimize the impact of health risks. Because of the increasing demand for training, the type of pedagogy involved, the benefits, and the philosophical underpinnings, global health education is the sort of GCE needed in LMICs to effectively face current global health challenges.

2.2 The Need for More Global Health Research In LMICs

“Each country needs to be able to generate knowledge relevant to its own situation, to allow it to determine its particular health problems, appraise the measures available for dealing with them, and choose the actions likely to produce the greatest improvement in health. This should not be seen as the exclusive preserve of universities or research councils, but equally of health/public services, non-governmental organizations, etc.” (Butler, 2000).

Global Health Research (GHR) is mainly concerned with the health of individuals and populations in less developed, less-resourced, poorer nations and regions of the world (Delisle et al., 2005). A major issue in the production of new knowledge is the inequitable distribution of research efforts and funds directed towards populations suffering the world's most significant health problems. For example, malaria, diarrheal diseases, pneumonia, and tuberculosis primarily affect LMICs and account for more than 20% of the burden of disease in the world, yet they receive less than 1% of the total public and private funds devoted to health research globally (WHO, 2004). Because of these types of imbalances, one of the aims of local capacity to perform GHR is to redirect research efforts — and potentially, funds — to the health problems of populations in LMICs.

Abundant evidence suggests that scientific knowledge is a central element for effective action (Eisenberg, 2001). Scientific knowledge is essential in health because it informs policies and practice; it helps to develop new technologies and medications; and equip individuals and populations to adopt healthy lifestyles, improve care-seeking and become proactive citizens to enforce their rights (Frenk et al., 2010). In the biomedical field alone, more than 1 million papers pour into the PubMed database each year (Landhuis, 2016). Unfortunately, most of this evidence comes from HICs and, for instance, is often biased towards HICs' health issues. In an attempt to use the latest evidence available, leaders and academicians in LMICs adopt the evidence produced in HICs without adaptation, even when it might not be culturally, socially, politically, and economically appropriate for their context (Movsisyan et al., 2019). In adopting evidence, the field of implementation research, which focuses on the impact of new evidence when translated into practice, might aid LMICs to contextualize better evidence produced in other circumstances and geographies (Geng et al., 2017; Villalobos Dintrans et al., 2019).

In an epoch of new knowledge overload — most of which is produced in HICs — and insufficient knowledge aimed to solve LMICs issues, academicians, private enterprises, NGOs, and public agencies in LMICs, have a duty to: 1) develop local capacity for GHR; 2) leverage domestic and

international resources to generate locally-relevant and high-quality evidence; and 3) contextualize and critically assess evidence produced in different conditions.

2.3 Trends and Challenges in Global Health

2.3.1 *The Sustainable Development Goals (SDGs)*

The SDGs launched in September 2015 as a follow-up to the Millennium Development Goals (MDGs) represent a shifting paradigm in human development by seeking convergence across sectors, and by being endorsed and requiring action by all countries (UN, 2015). The MDGs not only provided advancements in important matters such as decreasing poverty and halving maternal and child mortality, but also were the first example of global accountability for nation-states (Jamison et al., 2013). Now the 17 SDGs are even more ambitious; the first six SDGs—addressing poverty, hunger, education, health, gender and water, and sanitation—bear a striking resemblance to the original MDGs, but the remaining 11 are expansions to other areas such as the environment, infrastructure, and economic growth (UN, 2015). For instance, the SDGs can be used as a platform to expand GHE and GHR to LMICs, can serve to advance fundamental shared values and aspirations around health and create a movement aimed to build genuine global solidarity.

However, some authors also acknowledge the current SDGs' limitations in terms of local accountability, equity, and integration of health and non-health goals. In this realm, authors recommended that countries should be: 1) incentivized to engage and commit to a thoughtful exercise on national target-setting and regional benchmarking; 2) develop a more aggressive focus on equity; and 3) place more emphasis on the interdependence of health and non-health development goals (Nunes et al., 2016; Williams & Taylor, 2017).

2.3.2 Aid Stagnation and New Avenues In Global Health Financing

Most countries spend less money than they should to provide universal essential healthcare services (Evans & Pablos-Méndez, 2016). Since the 2000s, the global health field has functioned as a bridge from high-income countries to help LMICs (Schäferhoff et al., 2019). For example, the President's Emergency Plan for AIDS Relief (PEPFAR, 2002) addressed research and treatment of HIV/AIDS in developing nations which significantly expanded the funding in global health. Similarly, private philanthropies, such as the Bill and Melinda Gates Foundation, as well as a burgeoning number of NGOs, have all contributed to the expanding field of global health. Funding for global health went from \$2.5 billion in 1990, to \$14 billion in 2005, and \$30 billion in 2015 (Evans & Pablos-Méndez, 2016; Pablos-Méndez & Raviglione, 2018).

However, global health aid has stagnated since 2013, and been diluted by domestic growth. Development Assistance for Health (DAH) today accounts for less than 20% of the total health spending even in Africa and is shrinking in most recipient countries. It is already below 1% in middle-income countries like India (Pablos-Méndez & Raviglione, 2018). Donors are graduating successful countries from external assistance, intending to concentrate DAH in the poorest nations by 2030 (Pablos-Méndez & Raviglione, 2018). Middle-income countries, in particular, need to find other types of funding, like domestic resource mobilization (DRM), innovative financing (e.g., social impact bonds, loan guarantees), socially-responsible markets, and public-private partnerships (Pablos-Méndez & Raviglione, 2018).

While aid stagnation for middle-income countries such as México can be seen as unfortunate, it can also be seen as an opportunity to leverage domestic resources in creative ways and generate local capacity for GHE and GHR while keeping them focused on domestic issues and accountable to vulnerable populations.

2.3.3 *New Forces shaping Health systems*

Globally, population health is being challenged in different ways, from climate change and growing air pollution, toxic environmental exposure, food insecurity, massive population migration, and refugee crises, to emerging and re-emerging diseases. Each of these trends reinforce each other and concentrate their harm on vulnerable populations (Peters, 2018).

With the advent of the 21st century, five key large-scale trends are creating new challenges and opportunities for health systems across the world: sustainable health systems, emerging technologies, global demographics dynamics, new models of care (Braithwaite et al., 2018), and privatization of healthcare services.

If global health systems are to be sustainable, they will need to adapt to the ever-evolving challenges and constant pressures brought by rapid and unprecedented change. In this changing landscape, achieving a balance between quality of care and affordability of care is not easy, and more innovations and research are needed on this topic (Braithwaite et al., 2018). Emerging forms of digital and clinical technologies are altering health services. Parallel to the developments in e-health capacities, new clinical technologies with monitoring, and diagnostic capabilities, and concomitant treatment options are growing apace (Braithwaite et al., 2018).

Globally, populations continue to shift dynamically and are altering the demands for services everywhere. The world's population is not only increasing—it is projected that by 2100, the world will have 11.2 billion people, up from 7.6 billion today—but it is also aging and migrating. For example, two million people cross international borders daily, and 500 million people cross borders on commercial airlines annually (Detels, 2015). The shift in global demographics and continued global economic inequality remain significant challenges for future health systems aiming to provide care for all citizens (Braithwaite et al., 2018).

New models of care have emerged partly because of community health successes, new technologies, and as a result of other pressures. Implementing new models of care has mostly relied on hospitals and specialists, which has created problems such as patients undergoing unnecessary surgeries, procedures, and tests (Lyu et al., 2017). Moreover, the gap between urban and rural areas continues to grow due to the disproportionate concentrations of resources and health services in urban areas. In this century, population health will shift towards a focus on long-term and chronic care (Braithwaite et al., 2018). This new focus will demand healthcare services to be decentralized and flexible, and better at coordinating efforts for patients to move from provider-centric care to community-based and patient-centric care (Braithwaite et al., 2018). Consequently, this new shift is leading towards initiatives such as telehealth, e-delivery of services, care delivered in the home, the use of smartphone apps, and remote diagnosis (Frenk, 2015). For example, there is ample evidence that demonstrates the value added by well-designed, well-connected, and well-staffed community health worker programs to improve the healthcare delivery process and ameliorate harmful social arrangements that produce disease (Carrasco et al., 2019; Newman et al., 2018).

Another force shaping health systems around the world, especially in the Latin American region, is the privatization of public healthcare services (Keshavjee, 2014; Sobhani, 2019). This trend has been encouraged by economic and monetary policies imposed by the World Bank (WB) and the International Monetary Fund (IMF) (Keshavjee, 2014; Kim, 2000). The IMF's monetarist strategies have focused on prioritizing fiscal restraint (low budget deficits) and price stability (low inflation), which have resulted in low public expenditure and poor public services. Similarly, the World Bank's health policies have shifted health financing from government dominance to a mix of public-private and private dominance (Clemens & Kremer, 2016; Kentikelenis et al., 2016). Amongst other causal pathways, this has generated additional health inequities due to a dilution of government

responsibility for citizen's wellbeing, differential access to healthcare services, and weaker public health infrastructure (Keshavjee, 2014; Podgorsak, 2009).

In summary, GHE and GHR can help health systems to anticipate and adapt adequately to these trends and reap the benefits of ensuring citizens' health and wellbeing across the lifespan (Braithwaite et al., 2018; Jamison et al., 2013).

3. DELTA project design

3.1 Host Organization

Tecnológico de Monterrey (Tec), founded in 1943, is one of the largest private universities in México with approximately 90,000 students, 31 campuses across the country, and 10,000 professors (Tecnológico de Monterrey, n.d.-b). For decades, Tec has been a top 10-ranked university in Latin-America and in 2019, according to the QS World university Rankings, became the highest-ranking university in México (QS World University Rankings, 2019). Tec is well-known in México not only for being a reputable university but also for being a pioneer in higher education. For example, Tec was the first university in Latin America and the Spanish-speaking world to be connected to the internet in 1989 and is one of the leaders in patent applications amongst Mexican universities (OECD, 2006, p. 2). By 2015, Tec launched an innovative educational approach, called Educational Model Tec21, to enhance the abilities of its graduates and to develop the competencies required to meet the challenges of the 21st century. The three pillars of this new model are:

- Immersion in challenging and interactive experiences
- Flexible and adaptive learning environments
- Inspirational and innovative instructors

The end goal of the Model Tec21 is to educate and develop the next generation of leaders who will improve México and make the world a better place (Tecnológico de Monterrey, n.d.). Additionally, Tec has promoted the field of global health for almost a decade. In 2010, while I was a medical student at Tec, a group of students and I organized the first global health conference in México, and in 2014, the first class of global health was offered through the medical school. Despite its active involvement in global health matters, Tec is still the de facto leader in charge of educating Mexican elites. For example, four out of ten alumni create their own enterprise within five years after graduation, most of the largest Mexican companies are owned by Tec's alumni, and currently almost a fourth of the Mexican governors are Tec graduates (Tecnológico de Monterrey, n.d.). Bringing a perspective of global health equity to the elites of a country is crucial in order to bring about long-lasting change. These facets of Tec make it an ideal institution to pioneer a formalized global health institute to provide education and training for future global citizens and global health professionals.

In January 2019, Tec's leadership invited a team of global health allies, including me, to an exploratory meeting in relation to creating a global health institute. During the meeting it was decided that we should start a deep analysis of the barriers and enablers to creating a platform to socialize and train the future changemakers in global health in México. The deep-exploratory analysis became my DELTA project and, at that time, we called the idea, the Center of Global Health and Social Medicine (IESG). Shortly after, this name transitioned to become the Institute of Global Health Equity and our team became the Tec's Global Health Initiative (TGI). The idea of an Institute of Global Health Equity (IESG in Spanish) was received with enthusiasm amongst students and faculty.

3.2 DELTA doctoral project: Purpose, Aims, Questions, Hypotheses

Purpose

The purpose of this doctoral project was to address the gap in global health education and global health research in low- and middle-income countries by focusing on generating the theoretical and practical bases and momentum for launching an institution to promote global health education and global health research in México, a middle-income country.

Aims

1. Assess the internal and external conditions and forces that enable, restrict, or facilitate the creation of a institute of global health in Latin America, with a focus in México.
2. Codify the strategy, design, programs, revenue sources, and partnerships for the IESG.
3. Develop and implement an organizing effort and strategic action plan for the IESG that results in the proof of concept.

Analytical frameworks

The theoretical frameworks for this DELTA project were grounded in the following exploratory questions, which are rooted in community organizing practices:

- What is the best framework to assess the feasibility of IESG at Tec?
- What is the relevant Theory of Change (ToC) behind instituting the IESG at Tec?
- What is a relevant framework to implement and sustain change (adoption and institutionalization of the IESG at Tec)?

At best, theoretical frameworks are broad representations of reality, but can help to identify relevant elements of the past to shape our actions when facing similar situations in the present. To quote George Box, a famous British statistician, “all models are wrong, some of them are useful”

(Wasserstein, 2010). In facing reality, I tried to find the frameworks that best suited my DELTA project aims, and determined that the “Community Organizing Framework,” developed by Marshall Ganz would be used as the basis for implementing and sustaining change. The “Marketing Research” and “Theory of Change” frameworks helped to assess the conditions and define a logical theory of change, which served to complement the community organizing framework to guide the actions of creating momentum for the IESG.

Marketing research framework

This framework, described by Kotler and Fox, offers a strong methodology to analyze the environmental and resource conditions needed to launch a new academic institution. Based on these conditions, it also guides the design and structure of the new institution while helping with the marketing strategy to socialize it (Kotler, 1995). Refer to Figure 1 to see the marketing research framework summarizing the activities carried during my DELTA project.

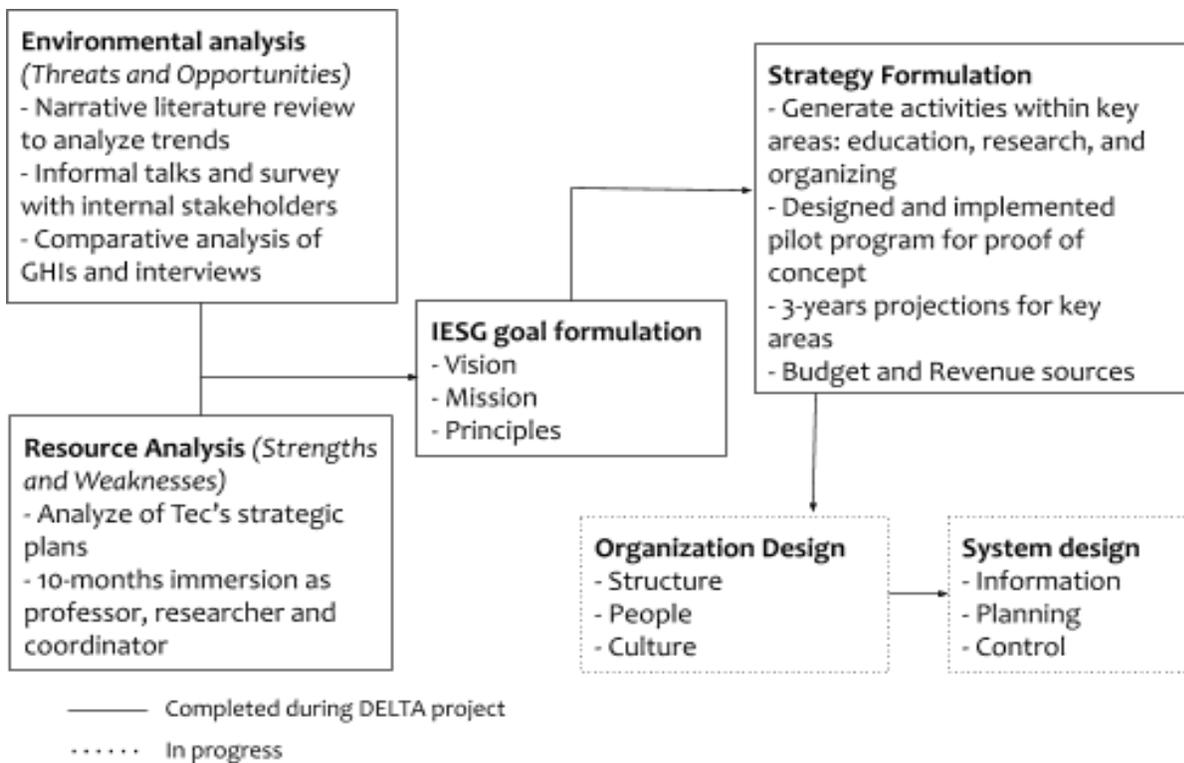


Figure 1. Strategic planning process model. Kotler and Fox, 1995

Theory of Change (ToC) framework

The second theoretical framework illustrates a basic causal pathway for achieving the desired change.

This framework links inputs, activities, outputs, and outcomes, with the desired impact (Vogel, 2012)

(See Figure 2). Further, it provides a mental map which can be used to plan activities based on the inputs and assets owned by the organizing group. Also, this framework helps to define indicators of success for each activity or set of events, which helps to maintain accountability through the implementation process. At the end, all is linked to specific outcomes and these, to the desired impact.

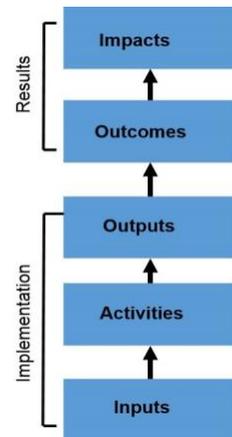


Figure 2. Theory of Change Example Framework

Community Organizing Framework

After visiting the United States in 1831, Alexis de Tocqueville wrote: “In a democracy, knowledge of how to combine is the mother of all forms of knowledge: on it depends all others” (Tocqueville et al., 2003). And this is precisely what organizing does; it builds the collective capacity needed to achieve a common goal. In the formal definition, community organizing is a “leadership practice based on accepting responsibility for enabling others to achieve purpose under conditions of uncertainty” (Ganz, 2014). In other words, organizing people is to build the power they need to generate change. I decided to use this framework to guide our efforts at Tec to gather the collective power we needed to move the university’s leadership to institutionalize the IESG

According to professor and expert organizer Marshall Ganz, there are five critical organizing practices: creating a shared story, creating shared relational commitment, creating shared structure, creating a shared strategy, and creating shared measurable action (Ganz, 2014).

Creating a Shared Story:

“Organizing is motivated by shared values expressed through public narrative.” The goal of creating a shared story is accessing shared values and the emotional resources “to respond to challenges with courage rather than reacting to them with fear” (Ganz, 2014). There are three stories that any movement should leverage. The “story of self” which displays what motivates each individual, the “story of us” that declares the values and collective experiences that unite the group, and the “story of now” which recognizes the urgency and the need for acting together while it proposes a hopeful way forward. For instance, public narrative helps to bridge the individual with the group, and it socializes the importance of acting together for change.

Creating Shared Relational Commitment

Organizing is based on “relationships and creating mutual commitments to work together” (Ganz, 2014). Public narrative helps to connect individual interests to shared interests and helps to identify the values shared in a group. All of this activity, associated with a common purpose and one-to-one meetings, assists in generating strong relationships rooted in commitments that people make to each other. These relationships are the foundation of any movement.

Creating Shared Structure

“A leadership structure can enable organizing that grows stronger through collaborative and cascading leadership development” (Ganz, 2014). Volunteer-based movements often fail due to a lack of reliable, consistent, and creative individual leaders. A snowflake leadership structure, with specific projects assigned to select leaders, encourages stability, creates motivation, and enforces accountability. This leadership structure works to enable volunteers to accomplish challenging work. As a prerequisite, leadership teams must first agree on a shared purpose, explicit norms, and specific roles.

Creating Shared Strategy

“Although based on broad values, effective organizing campaigns focus on a clear strategic objective, a way to turn those values into action” (Ganz, 2014). Even in large-scale efforts, there should be a responsibility for strategy at the top (or the center). Still, the strategy should have local goals with notable local responsibility for figuring out how to achieve those objectives. This shared responsibility for strategizing local objectives empowers, motivates, and encourages local teams. The marketing research and the Theory of Change frameworks helped to inform and give clarity to the strategizing efforts, which tend to be very challenging in organizing efforts.

Creating Shared Measurable Action

“Organizing outcomes must be clear, measurable, and specific if progress is to be evaluated, accountability practiced, and strategy adapted based on experience” (Ganz, 2014). It is crucial to develop clear and straight indicators to assess the organizing efforts. Some indicators might be volunteers recruited, money raised, people at a meeting, voters contacted, pledge cards signed, laws passed, etc. Regular reporting of progress in these indicators creates opportunities for feedback, learning, and adaptation. Additionally, transparency about the progress in these indicators must be shared with individuals, groups, and campaign levels.

4.3 Methods

I pursued a robust analysis to study the feasibility of the IESG and offer a pathway for design and execution. In this section, I connect the aims, my research questions, and the methodology I used to answer the questions presented throughout my thesis. The aims and their respective projects were pursued in the order presented, except for the organizing movement, which occurred alongside the other efforts in order to familiarize students and faculty with the idea of the IESG and to build collective power to nudge high-level Tec’s leadership to institute the IESG.

Aim 1. Assess the internal and external conditions and forces that enable, restrict, or facilitate the creation of the IESG.

Core question: What is the ecosystem — in terms of conditions, resources, and forces — around the world, in México, and at Tec de Monterrey to launch the IESG?

Methods used:

- **Narrative Literature Review** – I reviewed and gathered a summary of the global and national trends and forces in respect to GHE and GHR. I performed a literature search in multiple databases and search engines (PubMed and Google Scholar).
 - The research question: What are the trends and forces shaping the global health field with a special focus on México?
 - For my search, I only considered reports, books, or peer-reviewed articles from 2015 to 2019 given that I was especially interested in the research produced after the establishment of the Sustainable Development Goals in 2015.
- **Ecosystem Analysis** – I performed a survey with different stakeholders such as administrators, alumni, students, and faculty and performed a review of key institutional documents.
 - The survey was designed after having informative talks with relevant stakeholders at Tec about their beliefs and thoughts around the conditions and perceptions for the IESG in México. After designing the survey, administrators on Guadalajara, Monterrey and México City campuses were asked to assist with recruitment. The survey was answered by 485 people. All data collected through open questions on the survey was analyzed to identify and interpret patterns of salient themes.

- I reviewed all the relevant institutional documents related to Tec’s vision, mission, strategic plans and institutional priorities.

Aim 2. Codify the strategy, design, programs, revenue sources, and partnerships for the IESG.

Core question: What is the best design and structure for the IESG to fulfill its intended goals?

Methods used:

- **Comparative Analysis** – In designing the first global health-focused institution in Latin America, first I wanted to learn from similar institutions around the world. In this process I compiled, contrasted and compared the most renowned institutions in four areas of interest: vision, mission, revenue sources, programs, and impact.

First, I compared different lists of global health centers and institutions from different global health alliances and consortiums around the globe. Based on size, countries’ regions representativeness, and the number and magnitude of their activities planned, I decided to focus on the Consortium of Universities for Global Health (CUGH) members list and complemented the findings with a Google search. Then, I chose the most-mentioned global health institutions by Tec’s administrators, professors and students and wrote a summary on each area of interest using publicly available information (see Table 3). Next, I compared and contrasted these institutions and made a list of the key findings following the four areas of interest mentioned before. This list tried to answer the following question: what are the most common attributes across institutions when talking about revenue sources, resources, vision, and other components?

Then, I used the narrative literature review and the results of the survey to create a benchmark table to rank each of those institutions in terms of vision, mission, revenue sources, programs, and impact (for your reference, the benchmark table is in the Appendix). Next, using the benchmark table,

two independent reviewers and I rated each institution in each of the four areas of interest. After summing all the scores, I decided what institutions to contact and sent emails to their directors or associate directors to schedule a 30- to 60-minute semi-structured interview over Zoom or phone.

- **Qualitative Study** – I performed semi-structured interviews with leaders at the chosen GHIs found in the rating exercise to draw on their insights about their pedagogical approaches, resources, and best pathways to advance Tec’s IESG (n=8). The questions used during the interviews were tailored to each institution’s representative focusing on concrete areas that I wanted to explore. The questions were centered on these topics:

1. The university’s process and decision-making to establish their global health institution.
2. The challenges and barriers faced during the attempts and establishment of the global health institution.
3. The types of strategies utilized to create partnerships inter- and trans-institutionally.
4. The lessons learned for the design, financing, and partnerships needed for a successful global health institution.

During the calls, I took notes and if some questions arose after, I reached out to the interviewees via email. Finally, I analyzed the notes taken during the calls, focusing on recommendations and lessons about best practices on starting, socializing, running, and financing a global health institution.

Aim 3. Develop and implement a strategic action plan for the IESG that results in the proof of concept.

Core question: How to ensure the adoption, institutionalization, and success of the IESG at Tec?

Methods used:

- **Organizing movement** – I utilized the organizing framework to establish an organized and enlightened movement of people, including Tec students, faculty and administrators, in support of the idea of the IESG to ensure institutionalization.
- **Pilot program proposal** – I developed a proof of concept project that will showcase the students' interest for the CHG. Options might include: an introductory global health course, a certificate program in global health leadership, a global health immersion class, or an Intensive executive course in global health.
- **Execution plan** – I generated a summarized business plan with the need, vision, mission, programmatic focus, three-year projections, and revenue sources for the IESG to be delivered and presented to Tec's leadership.

SECTION 3. RESULTS

This section will review the findings of the DELTA project. Part I presents the results of the comparative analysis of global health institutions around the world and the one-on-one interviews with managers of well-renowned global health institutions (Aim 2). Part II presents the relevant results related to Tec's unique conditions that enable or facilitate the creation of the Institute of Global Health Equity (IESG in Spanish) obtained using the ecosystem analysis (Aim 1). Finally, in Part III, I discuss the organizing practices used by the Tec's Global Health Initiative (TGHI), present some major achievements of the TGHI, including the results of a pilot online course in global health taken by 153 Tec' students, and, finally, I provide a summarized business plan for Tec's leadership to launch the IESG (Aim 3).

PART I. Comparative Analysis: Best Practices in Academic Global Health Institutions

This section presents the findings of the GHI comparative analysis. The comparative analysis used publicly available information from 18 academic Global Health Institutions (GHIs) registered with CUGH (for more details, see Table 3 in the Appendix). The goal of this exercise was to compare their vision, mission, key programs, success indicators, and revenue sources in terms of similarities, differences and best practices.

1. Similarities and differences across global health institutions

In general, all the Global Health Institutions (GHIs) analyzed advance a vision of global health equity, ensuring that every single person—no matter who they are or where they come from—have the ability to lead a healthy and productive life. In their missions, two common themes arose: 1) inter- and transectorality; and 2) orientation towards improving vulnerable populations' health. Three types of activities emerged: 1) training; 2) research; and 3) implementation and service. For example, the Institute for Global Health Sciences (UCSF) and the Duke Global Health Institute perform the three

types of activities while the Harvard Global Health Institute and the Center for Global Health at Johns Hopkins University focus more on training and research activities, while not concentrating on implementation and service activities.

Likewise, GHIs have a diverse array of programs ranging from case competitions and international rotations to developing life-saving technologies. The three most common programs were international rotations or internships, research awards, and academic programs. In contrast, the least common programs were related to consultancies, advocacy, direct provision of services, and the ones focusing on developing new technologies for global health matters.

In success indicators, most of the institutions focused, in this order of frequency, on 1) number of students enrolled in academic programs, research activities or international rotations, 2) number of academic publications, 3) size and number of grants attracted, 4) amount of alliances or partnerships, 5) attendance and aggregate of global health events organized, 6) number of patients served, and 7) the number of patents.

On revenue sources, the global institutions analyzed mostly rely on donations and grants from the following sources, in this order of significance: 1) federal governments, 2) host universities, 3) foundations and individuals, 4) research grants, and 5) patents and subscriptions.

In summary, most GHIs focus in providing training and research opportunities to their students and most of their success indicators and revenue sources are aligned to that. Further, their revenue sources show the difficulty of sustaining GHIs by providing direct services or creating life-saving technologies. For further details on what each institution is doing, see Table 3 in the appendix.

1.1 Best Practices Across Academic Global Health Centers or Institutions:

Based on this analysis, there are four key practices shared across the 18 GHIs:

- Having a bold vision accompanied by a coherent mission reflected in two or three core activities.
- Having a diverse array of programs in three key areas: training, research, and implementation and service. Only a few institutions devote energy to the direct provision of healthcare services, consulting, or developing life-saving technologies. These appear to be seen as a diversion from core activities and are resource-intensive tasks.
- Defining clear success indicators based on their mission, such as the number of fellowships, events, students, publications, etc.
- Having a diversified portfolio of revenue sources with most of the revenues secured by their host university and federal, individual, or foundation grants.

2. Advice from Global Health Institutions' Managers on How to Set Up a Global Health Institution

After analyzing the chosen academic GHIs, with the support of two independent reviewers and using Table 2 in Appendix, I ranked these 18 GHIs and approached the directors and associate directors of the top institutions (or others performing relevant work under similar conditions to Tec) for a phone interview to receive advice on how to advance and set up Tec's IESG. In a few cases, I was referred to talk with people in other managerial roles within the institution.

Following the ranking of global health institutions, I interviewed the leaders of the following global health institutions:

1. Institute of Global Health Sciences (UCSF), USA.
2. Harvard Global Health Institute, USA.
3. University of Global Health Equity (UGHE), Rwanda.
4. Duke Global Health Institute, USA.
5. Rice 360° Institute for Global Health, USA.

6. Notre Dame's Eck Institute for Global Health, USA.
7. Global Health Track at Justus Liebig University Giessen, Germany.
8. National Institute of Public Health, México.

The most relevant insights that emerged from these interviews are discussed below. Table 1 contains a summarized version of the key recommendations.

2.1 Design and Structure of a Global Health Institution

In general, most of the participants advised that a global health institution should be a university-wide effort, which would help with fundraising efforts and would bring students, professors, and resources from other schools. If the circumstances do not allow it, then they suggested establishing a pilot program within the auspices of a school that can grow while the school bears the overheads and helps with branding. In addition, they recommended creating pro-bono committees and bodies to assist in the creation of support networks for the newly created institution or program. These committees would not only bring new ideas but also help in the socialization efforts with potential donors, allies and sponsors.

2.2 Generating Momentum

As in any significant intrapreneurship effort, support from the higher leadership levels is essential. In this case, all of the participants suggested engaging the University's President and higher-level authorities early on. Some participants also advised using the "creating a golden bridge" negotiation principle when having conversations with university leaders. According to this principle, it is crucial to discover what the university's leaders value the most, which can be anywhere from prestige, partnerships, or internships to publications and the number of students enrolled. Based on those findings, adapt the narrative to highlight how the global health institution or program would strengthen any of these valued elements..

At least two people also brought up using a focused approach to generate momentum. According to this approach, it might be challenging to get everybody engaged with broad notions of global health. Instead, it is crucial to focus on one pressing global health topic and use it to galvanize and build a community. Once some wins are achieved and a community is created, it should be easier to devote energy and momentum towards addressing other health issues. Finally, they suggested that any minor or significant achievement should be shared widely so that students, faculty, and leadership see the value added by the new global health program or institution. Consequently, for example, having a strong presence in social media and building a website are critical tasks.

2.3 Global Health Education

Educating the pipeline of students who will advocate and support the global health institution or program is a vital task. For instance, participants recommended creating academic programs such as classes, fellowships, masters, or specialties without forgetting three key characteristics: an immersive component, inter- and transdisciplinarity, and using the case-study pedagogy. They also emphasized the importance of inviting well-renowned global health professors to teach classes, which will help to raise interest in the programs.

Given the immersive component and case-study pedagogy, some participants acknowledged that some of these global health programs would be more expensive compared to traditional programs. For instance, they advised procuring scholarships for students from impoverished backgrounds so that access to GHE and GHR opportunities had an equity component.

Finally, most of the global health published curricula are written from a HIC perspective. Two participants mentioned that global health institutions and programs in LMICs must “tropicalize” classes’ curricula. By this, they meant to: 1) focus on domestic issues, 2) write and use internal case studies, and 3) offer local field-experiences. Nevertheless, they also advised not losing sight of the

global issues by making sure that every class has a perspective on how global trends influence the appearance of diseases in the local context. As an important note, the experience of communities with global health issues is ubiquitous, including in HICs. For instance, in “tropicalizing” curricula, it is important to highlight and preserve the moral orientation of global health to protecting the most underserved and vulnerable.

2.4 Research Activities

The participants identified that a lack of resources would be the common denominator in a global health institution or program in its initial phases. For instance, it is essential to use resources wisely. They mentioned that research activities might take a lot of resources (i.e., time, skills, money), so most of the interviewees recommended not performing research until a consolidated team has been formed. They noted that all resources should be invested in developing excellent academic programs while closely monitoring quality indicators using surveys and focus groups. After getting educational programs right, then the next step is defining a competitive research agenda to decide what global health areas to prioritize based on local needs and team’s capacities.

Finally, some participants remarked that in doing research, global health institutions and programs should always pursue new and interesting perspectives while using novel methodologies. For example, there is value in exploring the role of digital technologies to collect and analyze data. In addition, there is plenty of research on what works and what does not; however, there is a big gap in healthcare delivery and implementation science especially in LMICs. In this respect, they advised filling this implementation gap by starting research alliances with implementing partners such as health offices, non-governmental organizations, local public health offices, private providers, or government agencies.

2.5 Advocacy and Implementation

The interviewees indicated that along with focusing on generating academic programs, it would be important to define an advocacy agenda based on institutional interest, local and national needs, and competitive advantage. For example, developing engaging symposia and speaker series, and running successful advocacy campaigns will not only be helpful to advocate for some topics but also to highlight the value of the new global health institution or program. Further, these events should have at least three characteristics: inter- and transdisciplinary, national scope, and multiple collaborating partners.

In relation to implementation, they advised being close to the action. Most of the participants mentioned that it is resource-intensive for a global health institution or program to implement global health delivery or service programs; however, they recommended partnering with implementing associates, such as non-governmental organizations, local government health agencies, or private healthcare providers, to co-lead advocacy campaigns, perform research activities, and exchange resources. Finally, three participants advised including classes in advocacy and community organizing in courses and academic programs..

2.6 Strategic Partnerships

Global health institutions and programs need to partner with other institutions to be effective in accomplishing their goals. However, a standard process to consolidate these partnerships is essential. Two key ideas were reiterated during the interviews. First, it is crucial to have a well-connected champion in the partnering institution who sees the value in the collaboration and is willing to fight for it. Second, it is important to think in terms of resources and mutual interests and to strategize accordingly.

Participants agreed that in pursuing partnerships, it might be easier to start by collaborating with schools or departments within the host university. For example, partnerships within the school can help to recruit professors, initiate new research projects, generate symposiums, and co-create academic programs. Subsequently, it will be necessary to pursue partnerships with other national and international global health institutions and actors. In the discussion section I will talk more about the characteristics that these types of partnerships between GHIs in LMICs and HICs should have, according to the literature..

2.7 Revenue Sources

During the interviews, the participants stressed the importance of investing time early in the process of developing the business plan,, which would help to build a general idea of the global health institution or program vision, mission, main activities, indicators, and revenue sources. However, they recommended that this business plan be a living and changing document to be improved as conditions evolve and new lessons are learned.

They also mentioned that according to their experience, due to institutional norms and legal constraints, it might be difficult to accept donations without being legally established. For instance, it might be easier if the seed money comes from the host university at the beginning. However, donors are going to be needed eventually, and it is helpful to start cultivating donor relationships early on. They advised that in talking with potential donors, it is essential to make students and faculty the ambassadors in marketing the global health institution or program. In their experience, there is nothing more compelling than a student talking about how a global health immersive experience or class changed their career for the better.

In the beginning, when resources are limited, they commented that paying professors per session and inviting volunteering professors from other schools might help to keep the program going

without huge investments. Finally, most of the participants mentioned that the way by which many global health institutions and programs become sustainable is by offering academic programs (i.e., executive education programs) and having a committed network of donors.

PART II. Key Enablers to Launch an Institute of Global Health Equity at Tec

2.1. Environmental Analysis

In addition to studying the published literature to assess the current forces and trends that enable the development or expansion of GHE and GHR to LMICs, I also performed an environmental analysis to assess Tec's priorities and internal conditions to launch the IESG. To carry out this analysis, I reviewed institutional documents, interviewed different stakeholders, and implemented a survey in the medical school. Amongst the key findings are: a fierce commitment to the "Social Mortgage," which refers to improving how society works by prioritizing the most vulnerable, and the remarkable interest amongst students, professors and administrators in GHE and GHR programs.

2.1.1 Social Mortgage and Tec's proposal

According to the book, "The Social Mortgage," by David Ramírez, Tec's former rector, México has been a country in constant growth and change (Ramírez Padilla, 2013). Still, it has stagnated due to multiple factors. Today México suffers from poverty, violence, hopelessness, corruption, and death, which have generated feelings of fear, anger, suspicion, and helplessness among Mexicans. Ramírez notes that these feelings have led people to live in a conformist society, without commitment to eradicate the different problems that afflict them. For example, between 2008 and 2010, the number of people living in poverty increased from 48.8 million (44.5%) to 52 million (46.2%). According to Ramírez, corruption has also infiltrated the Mexican culture, and impunity skews and undermines the pursuit of justice. Moreover, unemployment affects people of any educational level, but especially those with a lower level of education (Ramírez Padilla, 2013). Furthermore, he mentions that the lack

of quality education is reflected in the fact that México occupies the last ranks amongst the OECD countries in reading comprehension, mathematics, and science.

Ramírez states that we, as humans, have not only tangible resources but also gifts such as creativity, innovation, and intelligence. These resources should not only be used to our own benefit, but also for helping others. This duty is what he calls the social mortgage, the moral debt that we have with society to take action to impact the lives of others since we all have the ability and resources to do so (Ramírez Padilla, 2013).

While Ramírez does not offer any particular pathway, a proposal to pay the social mortgage arose a few years after this diagnosis within the same Tecnológico de Monterrey. José Antonio Fernández, President of the Board of Tec, and Salvador Alva, President of Tec, published a book in 2018 called “A Possible México: A Disruptive Vision to Transform México.” In it, they propose some improvements to reach a new vision for the country, “a society that lives in safe cities, with educational opportunities and available employment.” To achieve this vision, they propose four key actions: 1) developing talent through high-quality education; 2) strengthening an entrepreneurial spirit at all levels; 3) developing safe and welcoming cities; and 4) creating a friendly ecosystem for innovation. The values that motivate this proposal are friendliness and service, teamwork, innovation, honesty, respect, inclusion, and meritocracy (Fernández et al., 2018).

According to the authors, starting with those actions, a new and more inclusive México can be built (Fernández et al., 2018). This disruptive vision was the primary motivator behind Tec’s 2020 and 2030 strategic plans..

2.1.2 Strategic plan 2020

Tecnológico de Monterrey is presented as an institution with attributes and advantages that make it unique and of great value to society. In its 2020 Strategic Plan, launched in 2015, a myriad of

projects and goals are proposed that would help to consolidate Tec as the best institution in México. Among these, some worthy of mentioning are: a cutting-edge educational model focused on the development of leaders with an entrepreneurial spirit (called Tec21 Model), efforts to increase the prestige of the institution, and a drive to develop better relationships with its alumni, companies, and institutions while training global citizens (Tecnológico de Monterrey, 2015).

The Tec21 model is based on creating innovative academic programs and schemes to create an entrepreneurial ecosystem among its students, teachers, and managers. The Tec21 model offers students interdisciplinary experiences, challenges, and links with industry and employers while ensuring the innovative use of cutting-edge technologies in education. The ultimate goal of this model is to improve the competitiveness of its graduates through the development of fundamental competencies such as critical thinking, problem-solving, social mortgage payment, global perspective, and collaborative work.

Other goals in the 2020 strategic plan are the implementation of projects that respond to the challenges at the bottom of the pyramid, increase the internationalization of students and teachers (rotations to other countries), and attract international professors and students. Also, Tecnológico de Monterrey will develop centers of excellence, by areas of knowledge, which is expected to serve to advance the incorporation of its graduates into professional life.

The 2020 Strategic Plan spurred many successes: it enabled Tec to achieve better selectivity during the admissions process, ensured the full implementation of the Tec 21 Model, increased the number of research professors from 195 to 570, helped the School of Medicine and Health Sciences to become one of the three most prestigious medical schools in the country, and allowed Tec to jump 101 places to position it in the top 200 of the QS World Universities Ranking system, making it México's top private university (Tecnológico de Monterrey, 2015).

In 2019, Tec published the 2030 Strategic Plan, which builds on the achievements of the 2020 Strategic Plan to push the institution even further.

2.1.3 Strategic plan 2030

With a view to 2030, Tecnológico de Monterrey decided on the following strategic slogan, "leadership, innovation, and entrepreneurship for human flourishing." To this end, Tec will seek to put people at the center to create a sustainable world through research, innovation, and entrepreneurship. Furthermore, Tec will invest resources in becoming an experiential and personalized learning platform while driving the transformation of cities and communities through public entrepreneurship. In general, five values guide this new approach: a sense of innovation for disruption and generating value; integrity to exercise freedom with responsibility; collaboration to achieve the proposed vision; empathy and inclusion; and global citizenship for a sustainable world. In terms of global citizenship, the 2030 Strategic Plan promotes collaboration and solidarity in solving the world's problems, especially the ones of underserved communities, as well as sustainable development for the benefit of future generations and the planet (Tecnológico de Monterrey, 2019).

Both strategic plans 2020 and 2030 show that Tec has the intention of becoming the best university in Latin America, as both a well-known, reputable institution that tackles the most pressing problems, but also one that is top-ranked.

2.1.4 University Ranking: An Institutional Priority

During my conversations with faculty, students and administrators, university ranking emerged as one of the school's main drivers. The QS World University Rankings, elaborated by QS Quacquarelli Symonds, an England-based enterprise, has become the world's most popular source of comparative data about university performance. It uses a remarkably consistent methodological

framework which relies on the following six metrics. The percentages indicate the weight given to each metric.

- **Academic Reputation (40%).** Based on an Academic Survey, it collates the expert opinions of over 94,000 individuals in the higher education space.
- **Employer Reputation (10%).** Based on almost 45,000 responses to a QS Employer Survey
- **Faculty/Student Ratio (20%).** Assesses the extent to which institutions are able to provide students with meaningful access to lecturers and tutors.
- **Citations per faculty (20%).** Measures the institutional research quality using the Citations per Faculty metric.
- **International Faculty Ratio (5%).** It demonstrates an ability to attract faculty from across the world.
- **International Student Ratio (5%).** It demonstrates an ability to attract students from across the world.

According to the QS World University Ranking 2020, out of 1002 universities, Tec is ranked 158. In only nine years, it has risen 200 positions. In addition, from being the number 9th in 2016, Tec moved to be the 3rd best university in Latin America. The areas with the highest score at Tec are employer reputation and faculty and international student ratios, while the lowest is citations per faculty (QS World University Rankings, 2016).

2.1.5 Results of a Survey with Key Stakeholders at Tec

The survey was answered by 485 people including professors (78), students (387), administrators (12), and alumni (8). The survey displayed the need across demographics and geographies of the IESG and offered good insights to align its design to the preferences of diverse stakeholders: 95.5% of the participants agreed that creating an Institute of Global Health Equity at Tec is a good or excellent idea; 77% mentioned that they would like to have more professional

opportunities in the field of global health, and 89% either "totally agreed" or "agreed" to the following affirmation: "Tec's IESG would contribute significantly to my professional development;" and 61% conveyed their disposition to support the idea actively.

Some of the quotes captured by the survey are:

- Professor: "It is an excellent opportunity to endorse the school's commitment of internationalization and innovation, in addition to being aligned with the 2030 vision."
- Student: "Entering into areas such as global health, which are usually relegated to the purely clinical aspect, seems to me to be an excellent step towards a more comprehensive management of health."
- Graduate: "The IESG would be an institutional pride and would give the institution a lot of prestige."

Across groups, the type of projects people would be more interested in are clinical rotations abroad and in-country, international research rotations, and global health implementation projects. More graphs and results of the survey can be found in Figures 5-10 in the Appendix C.

In summary, the vision of paying back the social mortgage and the mission and activities contained in the two strategic plans set a unique platform for GHE and GHR at Tec. Similarly, the university's interest in going up in the world universities ranking system opens avenues for using GHE and GHR as a platform for more publications and more international prestige. Finally, the fact that more than 95% of the participants surveyed want a IESG shows the support the idea has at the medical school, and according to talks with professors and students from other disciplines, this interest might be shared in other Tec's schools.

PART III. Application of Community Organizing Practices to Launch an Institute of Global Health Equity in México: The Tec Global Health Initiative

This section presents insights from the organizing efforts at Tec used to generate momentum to launch the IESG., It starts with the theory of change that I pursued to create collective power and make a compelling argument to Tec’s leadership. Then, it discusses the strategy pursued by the Tec’s Global Health Initiative (TGHI) and shares some major achievements by the TGHI in three areas of interest: training, research and community organizing. Finally, it presents a summarized business plan to build on these achievements and momentum to launch Tec’s Institute of Global Health Equity.

1. The Theory of Change

The theory of change was informed by findings from the narrative literature review, surveys, interviews with GHIs’ managers, and multiple meetings of the core team (described below). Figure 3 outlines the theory of change which we delineated as: “if we show the value of establishing the IESG to Tec leadership through symposiums, public events, classes, surveys, and research, and show them a compelling pathway to launch it, then they will allocate the necessary resources to make it happen.”

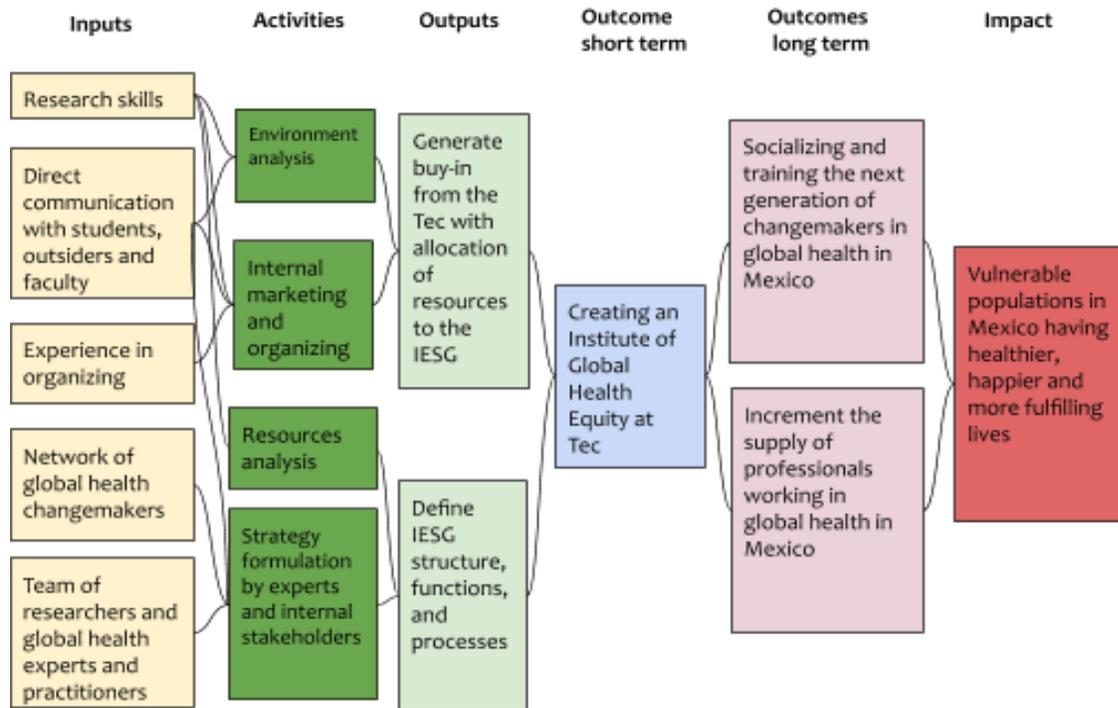


Figure 3. Theory of change logic map

In the beginning of this organizing effort, a well-balanced core team was generated that included the former director and the current director of Partners In Health México, a researcher in migration and reproductive health issues, a physician expert in health financing, an expert in humanitarian response with several years of experience with Doctors without Borders, a physician with an administrative position in the public health sector, a specialist in pulmonology and public health, and two of the three regional deans of Tec’s medical school. Three of the core team members were also professors of the school of medicine, and many of these were Tec’s alumni. As noted, the core team had the right balance of practical competencies in project management, GHR, GHE, and community organizing. In addition to this team, we also established a network of mentors such as leadership staff at Partners In Health, well-renowned authorities in GHE, GHR and GCE, experts in community organizing, and many other members of the social medicine and global health movement in the Americas. As a result, this mentor network connected us with endless opportunities for collaborative projects. Also, at Tec’s medical school, there was a student group located in Monterrey

that conducted regular active case findings with Partners In Health México, which provided us with some leverage to organize students.

These resources were strategically leveraged to assess the conditions and propose a compelling pathway to launch the IESG to Tec's leadership. Our goals were to use the IESG as an instrument for expanding GHE and GHR in México and bringing more professionals from any discipline to work with vulnerable populations, which we believed would have an impact on global health equity.

2. Tec's Global Health Initiative: The Strategy

As our theory of change expressed, the strategy was aligned to prove the value of GHE, and GHR to Tec's leadership by developing several global health-related projects that involved students and professors. We strived to ensure that all the projects implemented had an equity approach, were inter- and transdisciplinary, and were associated with one or more of three core areas: GHE, GHR, or community organizing. Later I will describe the most relevant projects that we conducted in these areas along with some achievements.

The tactics we used to implement our strategy were academic publications, global-health-related events, and one-on-one and group meetings with professors, students, and administrators. We also designed academic courses and programs, and initiated alliances with prestigious universities such as UNAM, Harvard University, Notre Dame University, and Johns Hopkins University.

3. Relevant achievements by TGHl

During 10 months of immersion at the host university, I worked with the core team to organize and lead a myriad of projects aligned to our strategy. As I will describe later, the way we organized these projects at the beginning was very entrepreneurial with a policy of "all doing everything."

However, now we are transitioning to a more distributive — or snowflake — type of leadership. So far, these projects continue operating and, in the face of COVID-19, others are being launched.

3.1 Global Health Education

With the core team, we assisted in the design of multiple courses related to the Tec21 educational model, such as Public Health and Biostatistics, Global Health for Leaders, Research Methods, Health Administration and Innovation, and Population Health. Also, we took positions as teachers in the following classes: Fundamentals of Health, Community I, II, III, and IV, Global Health and Preventive Medicine, and an online Global Health for Leaders course.

The online class of Global Health for Leaders served as our pilot program to test the interest in global health topics and highlight the value of global health education. So far, it is the first global health course offered to students of any discipline at Tec and we are not aware of any other similar class being offered in México. We designed and taught the course applying the global health competencies framework recommended by CUGH for students (to see the list of competencies, refer to Appendix A). In the fall of 2019, 153 students took the class; of these, 30 were from health-sciences and 123 from other careers like architecture, finances, business and management, engineering, and marketing. Using a pre- and post-class survey, I collected data on students' self-perceived competencies. As a results' limitation, 135 out of the 153 answered the post-survey. I labeled the pre-class as the control group and the post-class as the intervention group. In the question: how much do you know about global health? While 16% of the control group responded, "I know the topic well," 83.3% in the intervention group answered the same, Chi-Square test (3)=105.37, p=0.000. Similarly while only 22.5% in the control group responded "Totally agree" to the following affirmation: "I can describe what are the most pressing national and global health challenges," 77.6% responded the same in the intervention group, Chi-Square test (4)=102.17, p=0.000. Similar changes were noted for health

systems literacy and contextual factors that affect health such as globalization and social, economic and historical factors.

The survey also captured the following quotes in respect to the question: “What was the most important thing you learned in this class?”

"I learned how bad the situation in global health is, so I feel appealed to do something about it."

"I did not have an idea of what were the main causes of death in México and abroad. Now I know."

"I learned how people like me in a business track can have an impact on global health."

"I learned the importance of having a good performing health system."

"Now I know how politics, economics, business, culture, and more are all correlated to health."

"I learned to be more emphatic for the daily struggles of poor communities."

This class was the best-rated of all the online classes designed by any school at Tec, and it is already getting more traction. This semester 354 students from different careers and schools registered to the class which means an 231% increase in enrollment. Using the momentum created for this class, we also designed and are going to be teach an immersive global health course in partnership with Partners in Health México, and Tec’s International Center for Social Innovation in Chiapas for the summer of 2020, if COVID-19 allows it.

In addition, we designed a specialty in Global Public Health. This is the first non-medical specialty in global public health in México and is intended to be taken by any professional interested in global public health. The specialty is one year long, it has a hybrid model (online and in-person), and includes classes in social medicine, health finances, health leadership, research methods, health systems, and quality improvement. We invited professors from Harvard Medical School, Institute for

Healthcare Improvement, Tec's business school, UNAM, and the London School of Economics. The specialty was approved by Tec's rector and is now under a financial viability analysis.

We also designed a Diploma of Leadership in Global Public Health, which is similar to the specialty in global public health, but only two months long, and is entirely online. After a survey with newly graduated physicians, we believe that there is the demand for it, especially in general practitioners and students in their social service year, which is a year where doctors and nurses work with vulnerable populations or perform research as part of the requirements to obtain a health degree in México. This diploma of leadership should be launched in 2020 or 2021.

3.2 Research

Despite the recommendation from the interviews with GHIs' managers of not focusing much on research projects at the beginning, based on Tec's strategic priorities, we decided to work on a few research projects that were easy to implement and captured the value of what we were doing. During our time at Tec, we published four academic articles in indexed journals, presented five abstracts, and published a case study. The articles and abstracts are related to themes like medical education for the 21st century, accompaniment in community health workers programs, health system reforms, and health financing. We also obtained a \$20,000 grant from the Engage TB program led by Partners In Health and financed by the Global Fund to map civil organizations working on TB and to identify funding opportunities in México and Guatemala. Finally, based on needs and team's capacities, we have four research projects running on themes like migration, healthcare delivery models, direct and indirect costs related to having tuberculosis, and the quality of care provided in pharmacies located adjacent to doctors' offices.

3.3 Community organizing

Partnerships

We have started the process for a partnership with the Harvard Program of Global Surgery and Social Change to send residents and medical students to a fellowship. In 2019, we managed to get the first medical student to start a distance internship in rural Chiapas working with Partners In Health.

We also established a partnership with the Johns Hopkins MPH program for students to conduct research projects with Tec during their capstone or practicum, and formed an alliance with The David Rockefeller Center for Latin American Studies (DRCLAS) and Harvard Global Health Institute (HGHI) to receive students from Harvard University. In January 2020, we received the first student, and in the summer, we will host another one if COVID-19 permits. Some talks started with the University of Notre Dame for creating a program for professors and students' exchanges and collaborations in research protocols with Notre Dame's Eck Institute for Global Health.

Additionally, Master's and Bachelor's students from the University of Notre Dame have supported us in projects related to global health as part of the practicum for their class in International Development. Finally, we also started an alliance with the Tlalpan Delegation in México City so that students can carry out community service projects during their academic courses.

Diffusion

We organized a panel entitled Financing Equity: From Fragmented to Universal Health Systems, which featured professors from Tec's School of Government, the Center for Economic and Budgetary Research (CIEP in Spanish), and a representative of Health Systems Global for the Americas. We also held a Pre-Conference of Health Systems Global organized by The National Autonomous University of México (UNAM in Spanish), the National Institute of Public Health, WHO/PAHO, and Tec de Monterrey. In both events we had more than 50 attendees representing a myriad of health, academic and advocacy organizations.

Other activities we carried out include the following. We launched a global health student group on the México City Campus. We started the creation of a student-run journal titled *Frontiers in Global Health*, where students of any discipline can publish academic papers and class projects while being coached by professors and global health experts. We also designed a Health Equity Clinic at the México City Campus, to be launched in 2021, which will provide quality care to marginalized communities around the campus and facilitate the development and testing of new models of care and digital technologies for health. In addition, we organized a global mental health hackathon on the México City campus, which had to be canceled due to COVID-2019. Finally, we helped the medical school to organize a multi-campus campaign against the COVID-19 “infodemic” by training students to recognize misinformation and empowering them with tools to combat it through social media and other avenues.

4. The Institute of Global Health Equity (IESG Spanish): a Summarized Business Plan

After considering all the findings in my thesis, I wrote a summarized business plan for Tec’s leadership to design and launch an Institute of Global Health Equity (IESG in Spanish) in México. We decided to call it an Institute instead of a center for two reasons: branding and function. In the surveys we conducted, the word institute sounded more compelling and attractive to students and professors than center. In addition, the word institute typically describes the type of organization we wanted to establish, that is, one that crosses disciplines and schools’ limits, and this is true in the Tec’s structure.

4.1 Why Now and Why Tec?

The world is at a turning point. New trends such as climate change, antimicrobial resistance, social inequality, population aging, among many others, put humanity at risk. It is imperative we think and act beyond geographical or disciplinary limits to face these new health challenges. Global health — as a field for training, research and action — teaches us that we must come together and think

globally to generate high-impact local changes. Despite the accelerated growth of this field in the global north and the great demand among teachers and students, in Latin America there are only a few academic institutions that focus on promoting global health and in México, there is only one, The National Institute of Public Health. Therefore, we have made little progress in global health throughout México and Latin America.

The age of knowledge provides an unprecedented opportunity for countries and universities to improve global health. It is inevitable that new digital technologies and artificial intelligence will revolutionize our healthcare models and promote new pedagogical models. The systems and human rights thinking revolution will create new opportunities for universities to have more influence on political decisions, and the genetic revolution will allow us to bury many diseases.

Tec, with its academic prestige and new Tec21 model has the ideal platform to set the benchmark in Latin America for global health while also improving the course of humanity by creating opportunities for studying and addressing our great health challenges of the 21st century. Our goal is that the Institute of Equity in Global Health of Tecnológico de Monterrey will connect the brightest minds and agents of social change inside and outside the institution to address the great challenges in global health of this century. The IESG will address global health challenges by focusing on socially-relevant research, generating new academic programs and promoting a network of institutions and organizations that develop integrated global health projects that improve México and set an example to the world.

4.2 IESG Vision, Mission & Principles

Vision

Our vision is to achieve equity in health through education, research and community organizing, and with this, become the benchmark in global health in Latin America.

Mission

The IESG aims to close gaps in health equity through a multidisciplinary approach:

1. *Multidisciplinary Education*
 - a. Deliver high-quality academic programs and courses that are multidisciplinary, innovative, competencies-based and adapted to the needs of the student.
 - b. Provide immersive experiences and practicums that prepare them as agents of social change to address the social determinants of health and promote equity in health.
2. *Socially Relevant Research*
 - a. Generate new knowledge and applied practice through ground-breaking research and consulting in strategic areas, with emphasis on the implementation of projects and the provision of health services to people with chronic degenerative diseases.
 - b. Develop new technologies and health products focused in reducing health disparities.
 - c. Analyze public health policies in the light of existing systems and principles of equity and human rights.
3. *Community Organizing*
 - a. Carry out participatory activities that promote equity in global health, through community organization and service, and public events.

- b. Promote, link and coordinate a global network of institutions working for health equity to share best practices, collaborate on large-scale projects and create a support network.

The principles of the IESG

- Innovative leadership: Starting from current innovations and challenging existing paradigms, we are advancing a global health leadership model that imagines new systems and structures to improve equity in global health and create a sustainable and transformative impact.
- Social justice: Social justice is the central concept of global health equity, which encompasses the individuality, dignity, and inherent value of all people and communities, and challenges power gaps and structures that impede fair opportunities for optimal health for everyone.
- Pragmatic Solidarity: We strive to always work with, instead of on behalf of, communities to improve their health through the co-creation of knowledge, the establishment of a participatory agenda and collaborative action for social change.
- Rigor and scientific integrity: We strive to achieve outstanding performance in the promulgation of equity in global health which is based on scientifically rigorous research, evidence-based public health practice, and personal and professional integrity and ethics.
- Critical systems thinking: To evaluate and address inequities in global health, we use a critical and transdisciplinary approach to understand systems and structures in the context of an interconnected and interdependent world in which health inequities occur and reproduce.

4.3 IESG expected projections by 2023

If the IESG is launched in 2020, below are some projections and goals in three key of areas, education, research and community organizing. These projections are based on advice we received from managers of successful global health institutions around the globe, and our experience working on the Tec's Global Health Initiative.

Multidisciplinary Education

By 2023, more than 2% of the 86,184 undergraduate and high school students at Tec would be taking or had taken at least one immersive global health course, and 1% would be participating or have participated in international and national global health rotations. These courses and rotations would position Tec as the de facto leader in Latin America in training social change agents in global health. Also, new academic programs such as fellowships, specialties, and master's degrees would be created so that each year, hundreds of working professionals, seeking new skills to address health challenges in a globalized and interdependent world, will be enrolled.

Socially Relevant Research

Since global health is a connector of points, we expect three multidisciplinary focus groups would be formed in three strategic research areas: innovation in digital health and care models, health reform in the 21st century, and program implementation and healthcare delivery. These three groups would attract highly reputable researchers from Tec's different schools and abroad, which would generate a greater comparative advantage over other global public health institutions in Latin America. Every year, tens of publications that challenge old paradigms and show new ways to address current health challenges would be published in reputable journals and shared in national media.

Due to their exceptional talent and academic reputation, these focus groups would also initiate consultancies to accompany organizations and institutions that want to implement their recommendations. Additionally, they would collaborate with organizations and institutions to develop new technologies and health products with an equity approach. Consulting and developing of new technologies would ensure the adequate transfer of knowledge in public policy and practices and safeguard the financial sustainability of the IESG.

Community organizing

Through public events and national advocacy campaigns, every year, the IESG would link hundreds of national and international organizations and institutions working in the field of global health with the following objectives: creating a community of support for common causes, exchanging experiences and resources, and socializing new agents of social change in the field of global health.

4.4 Implementation plan

The Institute should have four phases to reach its impact and consolidate its financial sustainability. In *Phase 1*, three full-time people should be hired, and a working area should be set up. The three people should be in the following roles: one manager who will be responsible for creating partnerships, approach donors and gather support for the IESG; and two researchers with training in global health research methods and teaching experience. At this point, the team should apply for research grants and launch a global health diploma and an executive course. Also, an internal grant process should be initiated to encourage inter-school collaboration, and a global health symposium should be organized to launch the IESG. In *Phases 2 and 3*, the staff should increase to five to eight people, and consulting services and licenses for new health technologies should be added to the income portfolio. The profiles of the new additions to the team should respond to the institute's needs, but we anticipate they would come from backgrounds like health technologies, business and additional teacher-researchers. Moreover, research grants, academic programs, internal grants, and public events should continue expanding. Finally, in *Phase 4*, the IESG should have ten full-time team members and have achieved financial sustainability with a well-diversified portfolio that includes donations, research grants, academic programs, consulting, licensing of new technologies for health and a minor amount of seed funding by Tec. In addition, research grants, academic programs, internal grants, and public events should continue expanding.

3.5 Budget and Revenue Sources

The IESG should initially be launched with Tec's seed funding, then gradually should start adding new sources such as academic programs, donations and grants, consultancies and new patents. See some budget and expenditures projections by year in Table 6 in the Appendix. In general, income sources should change depending on the activities and resources available in each phase until most of the revenue comes from academic programs (31%), donations and grants (25%), new technologies licenses (22%), consultancies (12%), and seed funding by Tec (10%). These percentages are very preliminary; action and reflection would help to decide what revenue sources to pursue based on future conditions.

3.6 Summary

The current state and trends in global health invites us to imagine new paradigms and generate new solutions. Besides being perfectly aligned with Tec's 2020 and 2030 strategic plans and boosting its academic and social reputation in the national and international spheres, the IESG will accelerate the country's social change in health by being a hotbed of ideas, a leader in global health education and global health research. Undoubtedly, the IESG has the potential to become the reference point in global health in Latin America and serve as an example for the world.

SECTION 4. DISCUSSION

This section will discuss the key lessons learned while using community organizing practices aiming to institutionalize Tec's Institute of Global Health Equity. It will then consider the implications of the findings in this thesis for academic institutions, philanthropies, and funders interested in expanding global health education and research in LMICs.

1. Lessons Learned from Applications of Community Organizing Practices in Intrapreneurship

There has been a growing interest in launching global health programs around the globe (Battat et al., 2010; Colon-Gonzalez et al., 2015; Drain et al., 2007; IMFSA, 2010); however, not much has been written about the how to create momentum and get traction to launch these programs. During my DELTA project, I decided to use an organizing framework and confirmed its utility as an analytical framework and useful guidance for planning and acting for initiatives aiming to establish global health institutions or GHE and GHR programs in LMICs. However, it is important to contextualize my recommendations and find creative strategies to make change happen. Now, I will describe the essential ingredients to effective community organizing practices that I found during my time leading the Tec's Global Health initiative (TGHI).

1.1 A Reliable Core Team

A core team refers to the organizers leading all the organizing efforts (see Figure 4). Usually the number of people on the team is low, ranging from three to ten, depending on the magnitude of the endeavor. Launching a global health institution or global health program is not an easy task and involves a strong commitment from all individuals in the core team. In other words, each member must understand the importance of their role and embrace the responsibility for the success of the organizing effort. For instance, it is crucial that, from the beginning, group norms are specified and agreed upon. These norms should determine what is expected from each member, the

communication pathways, the regularity of meetings, the decision-making process, and under what circumstances a member is going to be replaced and the method used to replace that member. The organizing effort won't work if the core team changes regularly, or there are no norms in place to hold members accountable. In addition to norms, the organizing effort also should have a compelling narrative that creates commitment amongst its members. This narrative serves to leverage the story of self, us, and now, as described before, to generate commitment, build relationships and develop a shared purpose. As the head of the Tec Global Health Initiative (TGHI), I used one-on-one meetings with students, professors, administrators, and colleagues to leverage the story of self, us and now. In these talks, it was possible to identify what motivated each of the members of the initiative and, at the same time, if they were coordinating an project, to identify problems before they emerged. Also, these were moments for reconnecting, reenergizing and visualizing together the larger picture. As a result, often, students and professors committed to carrying out projects and put a lot of energy into them. Many of these projects were successful. However, we were not able to recreate the same between the members of the TGHI so that each member could share with others their story of self, us, and now. This lack of more spaces to share motivations, dreams, vision, and urgency to act between the members of the same endeavor might have caused some members not to understand why each member was part of the team and limited their level of commitment to each other. If I were to go back, I would try to create more spaces to share the story of self, us, and now, in order to show how people's stories, experiences, values, and urgency for change motivated them to support and be part of the IESG.

1.2 Generate a snowflake model of leadership from the beginning

One of the main difficulties of community organizing is the lack of full-time staff. These types of endeavors generally rely on people who voluntarily donate their time and resources without necessarily receiving much back but the promise of contributing to something meaningful. Sometimes

being a volunteer implies little commitment and little accountability; however, any serious change effort will require commitment, hard work and results from each of its team members. To achieve this and use volunteers' time effectively, a snowflake leadership model (see Figure 4) is recommended. In this model, each core member becomes a group leader and is accountable for their team and achieving their assigned goals. To be successful, this model requires regular trainings and frequent one-on-one meetings with each of the core members to provide support, encouragement, and solve problems before they appear.



Figure 4. Snowflake leadership model (Ganz, 2014)

When we started this organizing effort, the core team was composed by two regional deans of the school of medicine, some professors, and other veterans in the global health movement. First, we defined our group norms and then created a shared goal, which was “to get somebody hired full-time to expand the TGHI efforts by June 2020.” Given the uncertainty of the conditions, we first decided on an entrepreneurial model where everyone did everything, and I was the overall project coordinator. Soon I realized that several projects would not advance if I did not get involved, and at one period, I was the point person for 12 projects at the same time, which naturally lowered the quality in some of them. As a key learning from this lack of structure, we are now transitioning to develop leadership among students and other interested change agents by using a snowflake model where each leader has a role and is accountable for one or more projects. For example, students were leading the mental health hackathon, the student journal, and the Mexico City student group. The key to ensure that this models is successful is continuous mentoring and regular support from the core leaders to the teams' leaders (see Figure 5) through one-on-one meetings. This leadership model, in our experience, has better results in terms of organization, efficiency and

accountability compared with a less defined or structure-less model where everybody does everything.

1.3 Establish Champions Within the Institution

From the beginning, support of the organizing efforts must exist at the highest levels of the institution. Advancing global health projects implies going against the flow, reshaping bureaucratic structures, and crossing disciplinary limits. Not having the support of the highest-level authorities from the start will make organizing efforts very difficult. Early on, the core team should meet high-level authorities in the university and present the vision and plans of the organizing initiative. At those meetings, it is key to ask for feedback and suggestions on how to proceed and who else to involve in the initiative. We also found the Golden Bridge Negotiating principle described in the results section to be very helpful. If this approach to the university's leadership is not done from the inception, there is a risk of doing a lot of work with teachers and students only to find out that GHE or GHR are not within the institutional priorities. This may or may not be accurate since it may be, instead, a natural response to the surprise of a movement that was generated without the knowledge of university leaders. It is crucial to gain the support and endorsement of institutional champions from the beginning.

In this realm, we did have entire support from the regional deans of the school of medicine and the Dean of Education at Tec. The Dean of the School of Medicine also knew about our efforts and were supportive of them. In addition, we presented the IESG to the Dean of the School of Government and well-renowned professors within the same school who manifested a lot of interest and support. In general, having the backing of all these champions helped to galvanize the energy required to bring the IESG idea to the Tec's board which has shown positive signs to launch the IESG in 2021.

1.4 Define the Theory of Change Collaboratively

There are several ways to build a Theory of Change (ToC); however, the essential element is that all members of the core team agree with the ToC from the beginning. If the ToC results are wrong, but the whole core team agreed with it, it is possible to modify halfway. On the other hand, if it is wrong, but it was decided on by only one or a few members, the core team might face misunderstandings, internal quarrels, and divisions.

The process for determining a ToC is through meetings and validation. More than a linear process, defining a ToC is an iterative process that begins with a meeting with the core team. In this meeting, based on a mapping of internal resources (i.e., time, contacts, and skills), the first version of the ToC should be produced. Subsequently, this version should be validated with strategic allies, decision-makers, and other authorities within the institution that is intended to host the global health institution or program. Once that meaningful feedback is collected, another meeting must be held with the core team to incorporate the new findings into the ToC, collaboratively. This refinement process can be repeated a couple of times until everybody agrees. Although it takes time, defining the ToC with the whole team is one of the most critical steps in the organizing effort since it allows the team to map the resources that it has to promote change. Having established the ToC, it is possible to move on to the strategy. The TGHI's ToC can be found in Figure 4.

1.5 Define the Strategy Collaboratively

Similar to the theory of change, the strategy is defined during the core team meetings using the theory of change as the basis. The strategy is the common string that ties all the organizing efforts together because it shows how to use the resources (i.e., time, skills, contacts) of the core team to achieve the desired change. More than something static, the strategy is something dynamic that must illustrate the goals of current organizing efforts, following a Specific, Measurable, Achievable,

Relevant, and Time-Bounded (SMART) format, and show how achieving these goals is aligned to achieving the overall desired outcome. The way to make the strategy actionable on the field is through tactics, which are described in the next section.

As a mechanism to strategize within the core team, we had weekly calls where we discussed various plans and members proposed new ideas and projects to advance TGHI. In case members could not connect, we wrote a summary of the key takeaways from the meeting. In addition, I had regular calls with the regional deans of the medical school to communicate progress and get suggestions on how to proceed in different matters.

The TGHI strategy can be predicted from the image on the ToC in Figure 4. Our strategy was to leverage our network of contacts and mentors, links with Tec's decision-makers, students and teachers, and our research and organizing skills to achieve the IESG institutionalization. Institutionalization was defined as one of these two events happening by June 2020: 1) somebody is hired full time to continue the organizing and global health efforts, or 2) one of the global health academic programs proposed by the TGHI gets adopted and implemented by Tec. To date, none of these as occurred: however, the immersive global health course has been already approved for the Summer 2020, and the non-medical specialty in Global Public Health is under scrutiny by Tec's leadership.

1.6 Creative and Galvanizing Tactics

Tactics are the actions that bring the strategy to the field. According to our experience, , each member should be involved in the design and implementation of these actions in order to ensure success. It is important to note that at the tactics level, each member of the core team may decide on the methods used to achieve the strategy's goals; this freedom on the pathways to act sparks creativity, enables accountability, and generates motivation. In our experience, it was hard to motivate

core team members if they were told what to do, how to do it, when to do it, and with whom to do it. Core team members need challenges that motivate them to search in their arsenal of experiences and use their creativity to achieve the goal that was assigned to them. As a piece of advice, tactics should aim to be exciting and, if possible, fun, so that volunteers get thrilled to participate in them. In addition, it is always important that volunteers see clearly how their actions were aligned to a broader change. The most exciting moments for the TGHI was to see how individual efforts and creativity resulted in significant collective changes.

The TGHI's tactics were producing academic publications, organizing public events that showed the demand for GHE and GHR, socializing students and teachers on the benefits of global health education and research, designing global health-related classes that attracted as many students as possible, producing a critical analysis of internal and external conditions to launch the IESG, and meetings with key decision-makers at Tec to present the IESG idea. Some of these tactics successfully achieved their goals, while others did not. For example, we were able to produce academic publications, show the demand for GHE and GHR, analyze the internal and external conditions to launch the IESG, but we did not socialize as many students and teachers as we wanted, outside of the school of medicine, on the benefits of GHE and GHR. To plan, test, and reflect are always good friends in any organizing effort. On the other hand, a bad friend in organizing is something called the planning trap: failing into long periods of planning accompanied by numerous meetings and low levels of activity. Something that we are still trying to improve at the TGHI is the definition of indicators of success, given that we realized that some tactics are better than others in achieving similar goals. For example, one of the best ways to attract people to global health events is partnering with other departments, universities or actors.

1.7 Small Wins, Regular Activities and Transparent Communication

When things do not go as planned, there are low levels of activity or there is poor quality communication, it is easy to lose motivation, lower performance, or collapse into inaction. In the TGHI, we found that the one of the fuels of motivation is to celebrate small victories and keep activity levels high. Activities and small-wins celebrations generate the energy for more actions, which in turn creates more activities and small wins; soon, this becomes an enlightened cycle of action-wins-celebrations-action. A risk to this cycle is performing for the sake of performing without necessarily ensuring that the activities are aligned to the strategy. Given the many opportunities that emerged in front of us, for a few months we fell into the trap of performing for the sake of performing which wasted resources unnecessarily. Still, an organizing effort that does not celebrate individual and collective triumphs and does not maintain high levels of engagement is destined to fail; yet, every activity should be aligned to the strategy.

In addition to celebrating and keeping the activity levels high, transparency and well-defined communication avenues are key for motivation. We tried to keep everyone connected by creating regular communication avenues within the core team and between interested people to share news, provide follow-up to projects, and maintain accountability. The main pathways for communication were a few WhatsApp groups and regular meetings. For example, the core team had virtual meetings every week, and the broader group of students and interested people met every one or two months. In these meetings, every team or leader reported back to the group on its progress in assigned projects. In general, regular and transparent communication also helps to keep people motivated and engaged.

In summary, as we learned in México, community organizing is an excellent platform to advance the generation of global health institutions in academic settings in countries like México. However,

organizing practices are not always easy to implement. Sometimes there was a big gap between the theory and what is possible to achieve in prevailing conditions. Patience, reflection, and perseverance are the best allies in a community organizing effort to launch global health programs or GHIs in LMICs.

2. Implications and Recommendations

2.1 Implications for Academic Institutions in LMICs considering opening a global health institution or program

The promise of the field of global health is a world where everybody can live a healthy and productive life. As a result, global health education and global health research serve as natural bridges between disciplines, actors, sectors and institutions approaching pressing global health issues. Any educational institution can use global health education and research as platforms not only to develop competencies in their students to act in an interconnected and interdependent world, but also to build partnerships and alliances with other institutions and actors. For example, medical, nursing, and public health schools can benefit from using them as a platform to train health professionals to be more empathetic towards the suffering populations anywhere in the world, structurally more competent to respond to health challenges in a holistic manner, more committed to improving health systems, and more motivated towards teamwork and inter- and transdisciplinary collaborations, in short, to become better citizens and health professionals. However, these qualities are not only attractive to health-related schools but to anyone seeking to train social change agents in the face of the health predicaments of the 21st century; for example, COVID-19 has unveiled how ill-prepared health systems and populations around the globe are to deal with current global health challenges. In addition, GHE and GHR can be used by schools to generate partnerships with other actors and institutions to, for example, organize symposiums, share resources, advocate for global health equity issues, start research projects, provide services, and design and introduce new technologies. Further, due to the

dominant role of global health challenges in the public sphere (i.e., nutrition and agricultural policy and diabetes/obesity; pollution and climate change; COVID-19 and health systems; opioid crisis and its relation to stigma/care), public servants will have to face these regularly. Government schools can also use GHE and GHR as platforms to train their students to create and implement better public policies to approach present and future global health challenges more effectively. In Appendix B, there are two examples of universities creating these types of synergies: the BRAC School of Public Health in Bangladesh, and the University of Global Health Equity in Rwanda.

However, there is also an unfortunate truth; universities in LMICs tend to have fewer resources to launch new endeavors compared with universities in high-income countries. Fewer resources may lower the institutional capacity to launch a global health institution or program; however, since schools already have the infrastructure and teachers, it is possible to position any academic institution in an LMIC as a reputable global health institution without necessarily investing several additional resources and by doing this process in incremental steps. Initially, it would involve assigning someone full-time (or better, a core team) to lead the organizing efforts, to socialize the idea, and to leverage internal and external support. Some key characteristics of the lead person or core team in charge of the endeavor are to have: 1) in-depth knowledge and practical experience in global health work; 2) the ability to motivate colleagues, allies and students, which usually implies some degree of respectability and seniority; and 3) a genuine desire to train and socialize new generations to approach the most pressing health challenges. As requirements, this person or core team must have the necessary resources and influence to affect academic programs, try new pedagogies, organize training for professors, start research protocols, and create university-wide events. According to our experience, it is not required, at least initially, to build new infrastructure. GHE and GHR activities can be carried out using traditional teaching and research spaces. As a piece of advice, conducting research at the

beginning is possible but given the resources required to carry it out, it should be prioritized only if there is a strong team to conduct it and it is within the priorities of the host institution.

Additionally, it is important to start strategic partnerships with other institutions experienced in GHE and GHR to exchange resources, launch projects, and strategize together. Core components and best practices recommended in the literature for fair global health partnerships between global health institutions in HICs and LMICs are:

1. Engage inter -and transdisciplinary teams.
2. Develop equitable partnerships with shared leadership and stated common goals.
3. Align priorities and research agendas that are driven by the needs of the most vulnerable.
4. Program management, problem-solving, and where possible, financial oversight, should be led by the institution located in the LMIC.
5. The education of trainees from the LMICs site should be prioritized over the education of trainees from the HIC partner.
6. The applications for research or programmatic funding opportunities should be jointly conceived and written.
7. Research is conducted jointly with shared principal investigator and research team member roles, publication authorship and presentations, and broad availability of findings through publication in open-access or HINARI-supported journals (Adams et al., 2016; John et al., 2016; Larkan et al., 2016).

2.1.1 Implications for Universities in Latin America and México

Latin America is being confronted by health issues that require broad inter- and transdisciplinary thinking. Old, narrow, fragmented, and siloed approaches, which have been utilized for the past century, can only provide hampered outcomes (Frenk et al., 2010; Macinko et al., 2007). Governments in Latin America are starting to recognize the benefits of global health in the region for

diplomacy, foreign affairs, regulate pharma and food industries, migrant health professionals, and control of communicable diseases (Franco-Giraldo, 2016).

The Latin American Alliance for Global Health (ALASAG in Spanish), created in 2010, is a network of ten institutions devoted to create the southern version of global health and to generate avenues for collaboration between countries (Solimano & Valdivia, 2014); however, of those ten, only four have formal academic programs on GHE and GHR: the Dr. Salvador Allende School of Public Health in Chile, the National Institute of Public Health in México, the School of Public Health and Administration from the Universidad Peruana Cayetano Heredia in Peru, and the School of Public Health at University of São Paulo. There is a need to reinvigorate the GHE in the Latin America region. To see what academic programs each university offers see Table 4 in the appendix.

México's most significant challenges are the expanding inequality gap (Esquivel, 2015), the increasing burden of NCDs (Beyeler et al., 2015), and the effects of climate change (World Economic Forum, 2019). These challenges should be approached using the global health approach of inter- and transdisciplinary thinking and action following an equity approach (Alexánder et al., 2016). GHE and GHR can serve as a platform to join efforts, share resources, advocate for equity projects and help to generate a pipeline of knowledgeable global citizens and competent global health professionals to tackle these pressing health issues in México and everywhere.

2.2 Recommendations to Philanthropies, Agencies, and Funders Regarding Global Health Education Programs in Low- and Middle-Income Countries

2.2.1 Creating the Pipeline of Global Citizens and Equity-minded Health Workers

Young people have two attributes that make them ideal for promoting change: criticality and hope (Ganz, 2014). Being young means being critical of the world, seeing what others cannot, challenging the status quo, and offering new solutions. Being young also means to have hope, which

is the "belief in the plausibility of the possible as opposed to the necessity of the probable" (Ganz, 2014) — in other words, being young means to aspire to a better world by being critical of the one we inherit and working hard to beat the odds of what is possible. Criticality and hope generate enthusiasm and energy to build on what past generations have created and fulfill the generational duty of leaving a better world. Some examples of hope and criticality in action are Mahatma Gandhi, Martin Luther King Jr., Fidel Castro, Simon Bolivar, Malala Yousafzai, Jose Martí, Bill Gates, and Greta Thunberg, most of whom started their endeavors for change before their 30th birthday.

A critical factor in determining if this hope and criticality produce a meaningful impact lies in the degree of experiences and competencies (knowledge, skills, and values) owned by the individual (Reimers & Moss, 2014). Without adequate competencies and meaningful experiences, it becomes harder to achieve change. GHE and GHR not only can create more emphatic and social-justice-oriented citizens but can also develop competencies in the youth in LMICs to tackle pressing global health issues and their impact in their communities. In an era of constant change and crises, it is important to socialize and train our future leaders to beat the odds and improve health around the globe.

2.2.2 Global Health Education Projects: A Transformational Experience

There is ample evidence backing the benefits of GHE and GHR. Students who engage in global health education projects have more sensitivity towards cultural and socioeconomic factors that affect vulnerable populations, start seeing themselves as agents of change, understand better the value of public health, and are more inclined to promote global health equity. In graduate health professionals, GHE and GHR promote better doctor-patient rapport, more awareness of healthcare services spending, a better understanding of the social determinants of health, more knowledge about the healthcare system, and more motivation to pursue careers in global health. Due to the disproportionate burden of disease in LMICs, there is a huge need to expand GHE and GHR to LMICs so that students and health professionals have access to these benefits.

SECTION 5. CONCLUSION

As in other pivotal moments in history, current health challenges invite us to reimagine current approaches to preserve and protect populations' health everywhere, especially among the most underserved. Current global health issues — such as climate change, rapid urbanization, and infectious outbreaks and NCDs — disproportionately affect the poorest of the poor anywhere in the world, but especially in low- and middle-income countries.

Global health education and research prepare students and graduates to deal with these complex health issues by developing health professionals with more empathy for the underserved, greater understanding of contextual factors that influence health, more ability to work in teams in inter- and transprofessional settings, and with a stronger commitment to alleviate health disparities. Nevertheless, there is a lack of global health institutions promoting global health education and research in LMICs, which leaves a large percentage of the world's population without enough opportunities to get the training they need. Global health education and global health research can assist people in LMICs to develop their own knowledge and pathways to link medicine and health to other economic, political and social factors that determine health in their communities and to critically respond to complex global health issues in multifaceted and inter- and transdisciplinary ways.

More than ever, our most pressing issues require critically conscious citizens, social-justice-oriented professionals, and more inter- and transprofessional collaborations across sectors. These are precisely the aims of global health education and research. Universities in LMICs have a unique opportunity to train these much-needed professionals by establishing global health institutions and programs that ensure that their communities benefit from having a local cadre of global citizens more committed to advance social justice, and health professionals more competent in dealing with the structural causes of disease.

Through my doctoral project, I tested the value of using a community organizing approach in the host organization to generate momentum and launch a global health institution. The list of achievements of Tec's global health initiative provides an example of the benefits of using this approach under similar circumstances. While universities tend to be large bureaucratic institutions and often resist new ideas that upset the status quo, I hope this thesis provides a roadmap that might offer some guidance to individuals and actors who are considering to expand to benefits of the global health education and global health research to new settings and horizons, especially in LMICs. Finally, as in any significant endeavor, only with intentionality, perseverance, collaboration, determination, and constant reflection, is it possible to succeed.

APPENDIX

Appendix A. Narrative literature review findings

Title: Global health on the verge: trends and forces shaping the future of global health

Research question: What are the trends and forces shaping the global health field with a special focus on México?

Using combinations of the following MESH and no MESH terms: “Global Health,” “International Health,” “Education,” “History,” México,” “Latin America” in PubMed and Google scholar. With the exception of some foundational articles, I only included articles and reports published between 2015 to 2019.

Global health definition

“Global health is an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. Global health emphasizes transnational health issues, determinants, and solutions; involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration; and is a synthesis of population-based prevention with individual-level clinical care” (Koplan et al., 2009).

History of Global Health

There are three main stages in the history of global health:

1. *Tropical medicine* (16th-1851). Diseases and pandemics in the European colonies gave birth to the field of Tropical Medicine which aimed to control and mitigate (many times with violence and forced quarantines) diseases that affect trade.
2. *International Medicine* (1851-1990). In response to three global cholera pandemics between 1815-1860, physicians and diplomats from 12 European governments, including Austria, France, Great Britain, Portugal, Russia, Spain, Turkey and five states of what would become Italy, met in Paris for the first time in 1851. The International Sanitary Convention purpose was to create

an international code for containing epidemics, using the new methods of public health, so that the nation's trade and citizens could be protected. As a consequence of this meeting, the Pan-American Sanitary Bureau (now PAHO) and the Office International d'Hygiene Publique in Paris were created to collect epidemiologic information throughout the world, harnessing technologies such as the telegraph to track epidemics as they happened. In 1946, the recently formed United Nations (UN) met and approved a Constitution for what would become the World Health Organization (WHO) which took over the function of the international health bureaucracies of the early 20th century and became the central force in global health.

3. *Global Health (1990-2019)*. In 1990, the rise of the HIV/AIDS epidemic became a force that galvanized international cooperation between government and non-government organizations. Wealthy nations formed new agencies, such as the President's Emergency Fund for AIDS Relief (PEPFAR, 2002) to address research and treatment of HIV/AIDS in developing nations. Private philanthropies, such as the Bill and Melinda Gates Foundation, as well as a burgeoning number of NGOs all contributed to the expanding field of global health. As a response, the funding for global health went from US\$ 2.5 billion in 1990 to US\$14 billion in 2005. Organizations, such as Partners in Health, leveraged issues of expanding access to antiretroviral drugs to include other essential medicines, such as antibiotics and medications for NCDs. In 2000, the World Health Organization released eight Millennium Development Goals (MDGs) to set the agenda for global health in the 21st century, and in 2015 the MDGs were followed by the United Nations Sustainable Development Goals (Palilonis, n.d.).

See table 5 to see a comparison between tropical medicine, international health and global health in terms of approach, motivations, decision-making, and more.

Forces shaping the future of global health

Globalization

As a result of globalization, there are three changes to social relations that have a direct impact on global health (Detels, 2015):

- *Spatial change*: “refers to how people organize and interact across physical or territorial space” for example the new and expanding myriad of social interactions worldwide through the internet.
- *Temporal change*: “concerns how we think about and experience time”, which implies an acceleration of the timeframe in which things can be done
- *Cognitive change*: “concerns how we think about ourselves and the world around us” which refers to an adoption of knowledge, ideas, values, and beliefs through global media.

Globalists “predict a world of closer integration, shared identities, greater efficiency and productivity, rapid economic growth, and increased prosperity”, opponents of globalization argue that “there are fundamental flaws underpinning its logic in the form of stark imbalances in wealth and power which immutably divide the world into a few winners and many losers” (Detels, 2015).

Climate change

“Climate change now represents a near- to mid-term existential threat to human civilization” (world economic According to the Intergovernmental Panel on Climate Change, the effects of climate change on food security could be some of the most serious in the near-to-medium term, especially if global mean temperature increases by 3–4°C or more in the next decade (Woodward & Porter, 2016). Furthermore, climate change is a human-made phenomenon that affects primarily the poorest of the poor’s health (Selvey, 2015). For example, a change in 3°C will slow progress by cutting the anticipated improvement in food availability by about a third (per-person reductions of 3.2% [SD 0.4%] in global food availability, 4.0% [0.7%] in fruit and vegetable consumption, and 0.7% [0.1%] in red meat

consumption) which will produce over a half million deaths (Woodward & Porter, 2016). Furthermore, two-thirds of the global population is expected to live in cities by 2050 and already an estimated 800 million people live in more than 570 coastal cities vulnerable to a sea-level rise of 0.5 meters by 2050 (World Economic Forum, 2019). If we don't apply climate change policies quickly, the 2050 scenario would be of desertification, sea level rising and food scarcity which would make the planet inhabitable (World Economic Forum, 2019).

Urbanization

Significant global health challenges related to rapid and poorly planned urbanization are being confronted in the 21st century (i.e., unhealthy diets, physical inactivity, rapid population increase, etc) (Giles-Corti et al., 2016). Moreover, with the advent of globalization and urbanization, obesity has skyrocketed given the occidentalization of diets and habits, which promotes habits like sedentarism, high-calorie diets, and less healthy foods (Harvard T.H. Chan School of Public Health, 2012).

However, even though cities produce and can mean wellbeing to their inhabitants, they also may contain poverty and disease. To date, a billion people are living in slums (Talukder et al., 2015). A key part of the solution to harmful urbanization and the rise of NCDs is city planning that reduces non-communicable diseases and road trauma while also managing rapid urbanization. Cities can be designed to encourage walking, cycling, and public transport use while reducing private motor vehicle use by following a design policy that highlight destination accessibility, equitable distribution of employment across cities, managing demand by reducing the availability and increasing the cost of parking, designing pedestrian-friendly and cycling-friendly movement networks, achieving optimum levels of residential density, reducing distance to public transport, and enhancing the desirability of active travel modes (e.g., creating safe attractive neighborhoods and safe, affordable, and convenient public transport) (Giles-Corti et al., 2016).

Forces shaping Health systems

Globally, population health is being challenged in different ways, from climate change and growing air pollution, toxic environmental exposure, food insecurity, massive population migration, and refugee crises, to emerging and re-emerging diseases. Each of these trends reinforces each other and concentrates their harm on the most vulnerable populations (Peters, 2018).

With the advent of the 21st century, five key large-scale trends are creating new challenges and opportunities for health systems across the world: sustainable health systems, the genomics revolution, emerging technologies, global demographics dynamics, and new models of care (Braithwaite et al., 2018).

If global health systems are to be **sustainable**, they will need to adapt to the ever-evolving challenges and constant pressures wrought by rapid and unprecedented change. In this changing landscape, achieving a balance between quality of care and affordability of care is a challenge. More global health initiatives and research are needed on this topic (Braithwaite et al., 2018).

Genomics research has increased exponentially from the early 2000s, with the application of, and subsequent cost reductions in, genome sequencing; however, affordability still remains an obstacle. An appropriate education for front-line professionals to counsel, treat, and care for patients who stand to benefit from the new genomic technologies is essential (Braithwaite et al., 2018).

Emerging forms of **digital technology** and clinical technology are altering health services. Parallel to the developments in e-health capacities, new clinical technologies, monitoring, and diagnostic capabilities, and concomitant treatment options are growing apace (Braithwaite et al., 2018).

Globally, **populations** continue to shift dynamically and are altering the demands for services everywhere. The world's population is not only increasing—it is projected that by 2100, the world will have 11.2 billion people, up from 7.6 billion today—but it is also aging and migrating. For example, two million people cross international borders daily, and 500 million people cross borders on commercial airlines annually (Detels, 2015). The shift in worldwide **demographics** and continued global economic inequality remain major challenges for future health systems hoping to provide care for all citizens (Braithwaite et al., 2018).

New models of care have emerged partly because of new technologies but also as a result of other pressures. Implementing new models of care has, many times, relied on hospitals and specialists which has created problems such as patients undergoing unnecessary surgeries, procedures, and tests. Moreover, the gap between urban and rural areas continues to grow, due to the disproportionate concentrations of resources and health services in cities. In this century, populations will shift towards a focus on long-term and chronic care (Braithwaite et al., 2018). This new focus will demand healthcare services to be decentralized and flexible, and better at coordinating efforts for patients to move from provider-centric care to primary-, community- and patient-centric care (Braithwaite et al., 2018). This new shift is leading towards initiatives such as telehealth, e-delivery of services, care delivered in the home, the use of smartphone apps, and remote diagnosis (Frenk, 2015).

By anticipating and adapting adequately to these trends, health systems can reap the benefits and ensure citizens' health and wellbeing across the lifespan (Braithwaite et al., 2018)(Jamison et al., 2013).

The Problem With Education of Health Professionals

Worldwide, 2,420 medical schools, 467 schools or departments of public health, and an indeterminate number of postsecondary nursing educational institutions train about 1 million new doctors, nurses,

midwives, and public health professionals every year. These new professionals are trained using the instructions provided in the Flexner (physicians), Welch-Rose (public health), and Goldmark (nurses) reports, reports that were published more than 100 years ago (Frenk et al., 2010). However, these reports are not geared to address current health challenges and do not incorporate new advances in technologies and training pedagogies. For example, the Flexner report recommended the practice of medicine as an extension of the laboratory, only vaguely aware of the patient as a human but oblivious to the patient's environment (King, 1984). Sometimes these reports are still used to train our health professionals without rectifying historical flaws.

For example, the seminal report used to design and launch schools of public health in the U.S. was commissioned by the Rockefeller Foundation to William H. Welch, professor of pathology and dean of the Johns Hopkins School of Medicine and Wickliffe Rose, a trained anthropologist and professor of philosophy at Peabody College and the University of Nashville. As the story goes, Rose had in mind a national system of public health training with a central school of public health. His goal was to create “thoroughly trained and inspired leaders to mold public opinion and train the army of workers in the state's public health service” (Fee, 1992). In contrast, Welch favored scientific research and, by not involving Rose in the writing of the manuscript, was able to nudge the new discipline to a largely laboratory-based and research-focused educational system. Consequently, public health schools were built next to schools of medicine — instead of in proximity to schools of government, engineering or social sciences — and focused on biological research rather than in public health practice (Fee, 1992).

Serious academic efforts have been carried out to highlight the need of new institutional arrangements and training pedagogies. A Lancet Commission on Education of Health Professionals for the 21st Century concluded that professional education has not been able to overtake current challenges primarily because of “fragmented, outdated, and static curricula that produce ill-equipped

graduates” (Frenk, 2010). The Lancet Commission presented the following conclusions about the current state of health professionals training around the globe: there is a “mismatch of competencies to patient and population needs; poor teamwork; narrow technical focus without broader contextual understanding; episodic encounters rather than continuous care; predominant hospital orientation at the expense of primary care; quantitative and qualitative imbalances in the professional labor market; and weak leadership to improve health-system performance” (Frenk et al., 2010).

As a result of this outdated education model and institutional arrangements, we still have a hospital-centric, curative, and siloed models when facing complex health challenges (cite). This approach has shown to be insufficient not only in dealing with current health issues but potentially also in maintaining morale in the workforce. For example, in a recent systematic review Dugani and colleagues found rates of high emotional exhaustion (range 43.0% to 48.1%), high depersonalization (32.7% to 46.3%), and low personal achievement (20.3% to 47.9%) in primary healthcare providers in LMICs (Dugani et al., 2018). Parallely, health systems are not performing well, as evidenced by an increasing burden of disease related to noncommunicable chronic diseases (NCDs), such as diabetes, hypertension, and mental illness, as well as emergent and reemerging diseases in LMICs (IHME, 2017). For example, of the 56.9 million global deaths recorded in 2016, 71% were due to NCDs and over three-quarters of those occurred in LMICs, with 48% of these deaths occurring before the age of 70 years. These trends in deaths and disability related to NCDs are increasing every year in LMICs (IHME, 2017). New institutional and educational reforms are needed to improve healthcare outcomes and preventing discontent and mental illnesses amongst healthcare providers in LMICs.

The Sustainable Development Goals (SDGs)

The SDGs launched in September 2015 to follow on from the Millennium Development Goals represent a shifting paradigm in human development by seeking convergence across sectors by being endorsed and required action by all countries (United Nations, n.d.). The MDGs succeeded in achieving

3 of the 8 targets proposed and were the first example of global accountability for nation-states (Jamison et al., 2013). Now the 17 SDGs are even more ambitious; the first six SDGs—addressing poverty, hunger, education, health, gender and water, and sanitation—bear a striking resemblance to the original MDGs. The remaining 11 are concerned with the environment, infrastructure, and economic growth (United Nations, n.d.).

To increase the SDGs impact, countries should: 1) be incentivized to engage and commit to a thoughtful exercise on national target-setting and regional benchmarking; 2) develop a more aggressive focus on equity and 3) place emphasis on the interdependence of health and non-health development goals (Nunes et al., 2016).

Using the SDGs as a platform for global thinking for global impact, can serve to advance fundamental shared values and aspirations around health and create a movement aimed to build genuine global solidarity (Braithwaite et al., 2018; Williams & Taylor, 2017).

What the new global health should focus on according to the narrative literature review

Improve global health governance

Global governance is one of the four core functions of a global health system (Frenk & Moon, 2013). Since the establishment of the WHO in 1948, this UN specialized agency has worked with the mandate “to act as the directing and coordinating authority on international health work”.⁶ The recent Ebola crisis has re-opened the debate on failed global health governance and the poor performance of the World Health Organization.

In general, authors have two views to approach a system that failed: the “gridlock” (which maintains a system that has failed) and the “cosmopolitan moments” (which hopes that the scope of the tragedy might provide the impetus to effect change). The last one are “short points in time in which the global community comes together and acts to create new institutions and mechanisms

which they have otherwise not been willing to introduce” such as HIV/AIDS taken to the UN council in 2000, the MDGs putting health in the development goals in 2000, International Health Regulations because of SARS outbreak in 2003 and Pandemic Influenza Preparedness Framework led by H5N1 influenza 2007 (Kickbusch & Reddy, 2015).

Looking into the future, the WHO should approach its global governance health role as critical for national and international security, domestic and global economic well-being, and economic and social development in less developed countries, and as a major growth sector of the global economy. The WHO should lead a political revolution in global health governance; without this effort, the future of humanity looks less bright and hopeful.

New research focus

Implementation research is an integrated concept that links research and practice to accelerate the development and delivery of public health approaches. This type of research uses multiple disciplines and methods and emphasizes partnerships between community members, implementers, researchers, and policymakers (Villalobos Dintrans et al., 2019).

As the world moves forward to implementing programs and policies to reach the SDGs, implementation research in global health would become more and more relevant because it addresses the challenges of the know-do gap in real-world settings and the practicalities of achieving national and global health goals (Geng et al., 2017).

Foremost, implementation research focuses on practical approaches to improve implementation and to enhance equity, efficiency, scale-up, and sustainability – aiming to improve people’s health (Theobald et al., 2018). To be successful, implementation research should have four main characteristics: 1) address implementation problems, 2) involve partnerships to co-create solutions, 3) use tacit knowledge and research, and 4) be based on a shared commitment towards improving health outcomes (Theobald et al., 2018).

New avenues in global health financing

Most countries spend less money than they should in order to provide universal basic services (Evans & Pablos-Méndez, 2016). Since the 2000's, global health has functioned as a bridge from high-income countries to help low and middle-low income countries.²¹ For example, the President's Emergency Fund for AIDS Relief (PEPFAR, 2002) addressed research and treatment of HIV/AIDS in developing nations and in consequence expanded significantly the funding in global health. Similarly, private philanthropies, such as the Bill and Melinda Gates Foundation, as well as a burgeoning number of NGOs all contributed to the expanding field of global health. Funding for global health went from US\$ 2.5 billion in 1990 to US\$14 billion in 2005 and 30 billion in 2015 (Evans & Pablos-Méndez, 2016; Pablos-Méndez & Raviglione, 2018).

However, global health aid has stagnated since 2013 and it has been diluted by domestic growth. Development Assistance for Health (DAH) today accounts for less than 20% of the total health spending even in Africa and is shrinking in most recipient countries. It is already below 1% in middle-income countries like India.²¹ Donors are graduating successful countries from external assistance, with the goal of concentrating DAH in the poorest nations by 2030 (Pablos-Méndez & Raviglione, 2018). Especially, middle-income countries should find other types of funding, like domestic resource mobilization (DRM), innovative financing (e.g., social impact bonds, loan guarantees), public-private partnerships (i.e., PPPs 2.0, which will be less top-down and more engaged in local markets and political economy) and shaping responsible markets (Pablos-Méndez & Raviglione, 2018).

Competencies based global health education

Global health education demand is dramatically growing in the United States due to three main factors: 1) a greater emphasis on internationalization in higher education, 2) heightened public visibility of the global health agenda (i.e., SDGs, UHC2030), and 3) the expansion of new resources and

opportunities for universities and students (Merson & Chapman Page, Kimberly, 2009). This growth of on-demand is being imitated around the globe (Kerry et al., 2011; Merson et al., 2012).

Currently, there are around 20 Institutions on the CUGH website offering Global Health as a major for undergraduates, 39 offering global health certificates, and more than 60 offering masters in global health (*Academic Global Health Programs | Consortium of Universities for Global Health, n.d.*).

Impactful education in global health should be multifaceted, multi-disciplinary, practice-oriented, and competencies-based as highlighted in the literature (Fineberg & Hunter, 2013; Fried et al., 2012; Jamison et al., 2013; Merson et al., 2012; Quinn, 2008). According to The Consortium of Universities for Global Health (CUGH), there are 11 main domains and 37 competencies in the field of Global Health:

Domain 1: Global Burden of Disease:

- Competency 1a: Describe the major causes of morbidity and mortality around the world, and how the risk of disease varies with regions.
- Competency 1b: Describe major public health efforts to reduce disparities in global health (such as the Millennium Development Goals and the Global Fund to Fight AIDS, TB, and Malaria).
- Competency 1c: Validate the health status of populations using available data (e.g., public health surveillance data, vital statistics, registries, surveys, electronic health records and health plan claims data).

Domain 2: Globalization of Health and Health Care

- Competency 2a: Describe different national models or health systems for provision of healthcare and their respective effects on health and healthcare expenditure.
- Competency 2b: Describe how global trends in healthcare practice, commerce and culture, multinational agreements and multinational organizations contribute to the quality and availability of health and healthcare locally and internationally.
- Competency 2c: Describe how travel and trade contribution to the spread of communicable and chronic diseases
- Competency 2d: Describe general trends and influences in the global availability and movement of health care workers.

Domain 3: Social and Environmental Determinants of Health:

- Competency 3a: Describe how cultural context influences perceptions of health and disease.
- Competency 3b: List major social and economic determinants of health and their impacts on the access to and quality of health services and on differences in morbidity and mortality between and within countries.
- Competency 3c: Describe the relationship between access to and quality of water, sanitation, food and air on individual and population health.

Domain 4: Capacity Strengthening:

- Competency 4a: Collaborate with a host or partner organization to assess the organization's operational capacity.
- Competency 4b: Co-create strategies with the community to strengthen community capabilities and contribute to reduction in health disparities and improvement of community health.
- Competency 4c: Integrate community assets and resources to improve the health of individuals and populations.

Domain 5: Collaboration, Partnering and Communication:

- Competency 5a: Include representatives of diverse constituencies in community partnerships and foster interactive learning with these partners.
- Competency 5b: Demonstrate diplomacy and build trust with community partners.
- Competency 5c: Communicate joint lessons learned to community partners and global constituencies.
- Competency 5d: Exhibit interprofessional values and communication skills that demonstrate respect for, and awareness of, the unique cultures, values, roles/responsibilities and expertise represented by other professionals and groups that work in global health.
- Competency 5e: Acknowledge one's limitations in skills, knowledge, and abilities.
- Competency 5f: Apply leadership practices that support collaborative practice and team effectiveness.

Domain 6: Ethics

- Competency 6a: Demonstrate an understanding of and an ability to resolve common ethical issues and challenges that arise in working within diverse economic, political and cultural contexts as well as working with vulnerable populations in low resource settings to address global health issues.
- Competency 6b: Demonstrate an awareness of local and national codes of ethics relevant to one's working environment.
- Competency 6c: Apply the fundamental principles of international standards for the protection of human subjects in diverse cultural settings.

Domain 7: Professional Practice:

- Competency 7a: Demonstrate integrity, regard and respect for others in all aspects of professional practice.
- Competency 7b: Articulate barriers to health and healthcare in low-resource settings locally and internationally.
- Competency 7c: Demonstrate the ability to adapt clinical or discipline-specific skills and practice in a resource-constrained setting.

Domain 8: Health Equity and Social Justice

- Competency 8a: Apply social justice and human rights principles in addressing global health problems.
- Competency 8b: Implement strategies to engage marginalized and vulnerable populations in making decisions that affect their health and well-being.
- Competency 8c: Demonstrate a basic understanding of the relationship between health, human rights, and global inequities.
- Competency 8d: Describe the role of WHO in linking health and human rights, the Universal Declaration of Human Rights, International Ethical Guidelines for Biomedical Research involving Human Subjects.
- Competency 8e: Demonstrate a commitment to social responsibility.

- Competency 8f: Develop understanding and awareness of the health care workforce crisis in the developing world, the factors that contribute to this, and strategies to address this problem.

Domain 9: Program Management

- Competency 9a: Plan, implement, and evaluate an evidence-based program.
- Competency 9b: Apply project management techniques throughout program planning, implementation and evaluation.

Domain 10: Sociocultural and Political Awareness

- Competency 10a: Describe the roles and relationships of the major entities influencing global health and development.
- Competency 11a: Identify how demographic and other major factors can influence patterns of morbidity, mortality, and disability in a defined population.

Domain 11: Strategic Analysis

- Competency 11b: Conduct a community health needs assessment.
- Competency 11d: Design context specific-health interventions based upon situation analysis.

The CUGH regards two levels of expertise in global health: the global citizen level and the basic operational program-oriented level. The 1-3, 5-8, and domain 10, comprise the competencies recommended for the global citizen level, which includes students and professors from diverse disciplines. Domains 4, 9 and 11 are recommended for the basic operational program-oriented level which includes policymakers, implementers and program directors (*CUGH Global Health Toolkit Web Version.pdf*—Google Search, n.d.).

As we move forward in our interconnected and interdependent world, multifaceted, multi-disciplinary, practice-oriented, and competencies-based global health education will be more and more important to approach and solve future challenges.

Global health implications for México and Latin America

Governments in Latin America recognize the benefits of global health in the region for diplomacy, foreign affairs, regulate pharma and food industries, certificate migrant health professionals and control communicable diseases (Franco-Giraldo, 2016). However, only three institutions have programs on global health in Latin America: The Public Health school in Chile, the National Institute of Public Health in México, and the Faculty of Public Health in Peru (Solimano &

Valdivia, 2014). The Latin American and Caribbean alliance of Global Health, created in 2010, is a network of institutions devoted to creating the south version of global health and to create avenues for collaboration between countries (Solimano & Valdivia, 2014).

México's biggest challenges are the expanding inequality gap (Esquivel, 2015), the increasing burden of NCDs (Beyeler et al., 2015) and the effects of climate change (World Economic Forum, 2019). These challenges should be approached using the global health approach of multidisciplinary thinking and action following an equity approach (Alexánder et al., 2016). New opportunities arise with the advent of new resources, for example, new technologies can help to facilitate NCDs management by using eHealth technologies across the continuum of care using networks more than current pyramidal structures (Frenk, 2015).

Appendix B. Universities in LMICs promoting GHE and GHR: Selected Examples

There are some examples of universities in LMICs delivering GHE to their students, examples include the University of Global Health Equity in Rwanda and the BRAC James P. Grant School of Public Health in Bangladesh.

BRAC James P. Grant School of Public Health

The BRAC James P. Grant School of Public Health was founded in 2004 to address the unmet public health challenges in Asia, Africa, and South America. The school prepares people to become leaders, critical thinkers, researchers and advocates in global public health at local, national, and international levels. The partners and co-founders of the school are:

- BRAC, the world's largest NGO, serving around 100 million people in Bangladesh and working in 9 countries between Africa and Asia.
- International Center for Diarrheal Disease Research in Bangladesh.

- BRAC University.

The BRAC James P. Grant School of Public Health offers a 12-month full-time Master's degree in Public Health that focuses on the development of essential public health skills. The master's program is taught by a wide variety of faculty members from prestigious universities around the globe, and it is enriched by the many partnerships that the school has with local and global institutions in developed and developing countries.

The School also offers global classrooms with students from all over the world from different disciplines and contexts, pedagogical methods based on problem-solving and case studies, and community-based-learning experiences.

In addition, the school has a Center for the Development of Professional Skills in Global Health that offers short courses for national and international students for the development of practical skills in public health (BRAC James P Grant School of Public Health, n.d.).

University of Global Health Equity (UGHE)

The idea arose in 2013 during the Oral Health Stakeholders in Kigali when the Cummings Foundation proposed to create a new university that served not only Rwanda but also Africa and beyond. The goal of this university was to train global health leaders who could build and maintain effective health systems. In 2014, the Cummings Foundation, Partners In Health, and the Bill and Melinda Gates Foundation created the University of Global Health Equity (UGHE), a pioneer institution in training leaders who develop health systems and services that connect underserved communities with essential life-saving care.

UGHE offers a Bachelor of Medicine and a Bachelor of Surgery, both programs with a duration of six and a half years. These programs are based on providing real care to patients at home,

community clinics, and district and reference hospitals while emphasizing topics such as healthcare delivery, social determinants of health, leadership, and management. Both programs begin with a six-month preparatory phase that serves students to engage in the university environment and concludes with a clinical and practical internship year. In addition, these programs are also offered with a double degree that includes a Master of Science in Global Health Delivery, which individually consists of a one-year (*University of Global Health Equity, n.d.*).

Table 1. Best Practices in Launching Global Health Institutions in Academic Settings

Design	Generating momentum	Global health education	Research activities	Advocacy and implementation	Strategic partnerships	Revenue sources
<ul style="list-style-type: none"> - Make the GHI a University-wide institution. This transversality will facilitate transdisciplinary projects, fundraising efforts and will attract students from different backgrounds. - If it is not possible to become a university-wide effort, start as a program, build a brand name, and then expand it strategically. - Create pro-bono board committees at least in the following areas: fundraising, external advisory, internal advisory. 	<ul style="list-style-type: none"> - Engage the university's President and higher-level authorities early on. - Always have in mind what your institution values the most: prestige, partnerships, internships, publications, number of students enrolled, etc., then adapt your narrative to mention how the GHI will strengthen any of these. - Map your team's resources and tactically mobilize them to effect change. - Choose and focus on one issue (i.e., climate change, diabetes) to galvanize and build a community. Then strategically move on to other issues. - Share and market widely any successes and news. - Have a strong presence in social media and create a website. 	<ul style="list-style-type: none"> - Start by creating academic programs such as courses, fellowships, Masters, or specialties. Use them to pilot and probe the GHI concept. - Invite well-renowned global health professors to teach some of your classes. - Use the case study method. - Offer scholarships for students from impoverished backgrounds. - Tropicalize the classes' curricula and focus on offering domestic field experiences. 	<ul style="list-style-type: none"> - Focus on developing academic programs first. - Define your research competitive advantage and then decide on what global health areas to focus on. - Use novel methodologies and explore the role of digital technologies to collect and analyze data. - Give more value to healthcare delivery, and program implementation science. - Approach the same issue from different and interesting perspectives. 	<ul style="list-style-type: none"> - Define an advocacy agenda based on interest, need and competitive advantage. - Develop interesting symposiums, speaker series, and run successful advocacy campaigns. - Offer classes on advocacy and community organizing in courses and academic programs. - Ensure your events have a national scope and include as many participants as possible. - Focus on developing partnerships with implementing partners to address global health delivery programs 	<ul style="list-style-type: none"> - Identify a well-connected champion who sees the value in the collaboration. - Start by partnering with schools within your university to recruit professors, start new research projects, generate symposiums, and create academic programs. - Subsequently generate partnerships with other national and international global health institutions and actors. 	<ul style="list-style-type: none"> - The seed resources should come from the host institution. - Start cultivating donor relationships early on. Make students and faculty your ambassadors. - Paying professors per session and inviting professors from other schools can help to save resources at the beginning. - Invest time in developing your business plan. - Make your GHI sustainable by offering academic programs and having committed donors.

Table 2. Benchmarking table for ranking global health institutions

Benchmark	Poor (1 point)	Good (2 points)	Best (3 points)
Vision	Unengaging	Engaging	Engaging and Inspiring
Mission	Unclear	Somewhat clear	Clear and straightforward. Easy to know what they do and how they do it
Revenue (finances)	Poorly diversified and not innovative. Rely mostly on revenue from one source	Diversified. Generate revenue from multiple traditional sources	Diversified and innovative. Generate revenue from multiple sources and have an innovative approach
Programs	Poorly diversified. Focus mostly on one health topic	Diverse. Have multiple programs but they don't seem to be integrated or complement with each other	Diverse and integrated. Multiple programs that tackle multiple issues and they collaborate with (or learn from) each other
Impact	Low or unclear	Good. They present good results of impact in terms of training and/or research and/or change in people's lives	Impressive. It presents incredible indicator' improvements in terms of training and/or research and/or change in people's lives

Table 3. Comparison of selected global health institutions around the globe

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
University of Virginia’s (UVa) Center for Global Health (IESG)	To promote health in resource-limited settings by fostering the commitment of students, faculty, and partners from many disciplines to support health for all.	To support the development of global health leaders and global health capacity with partner institutions, organizations, faculty and students.	<p>The Global Health Leadership Track (GHLT) prepares physicians to become leaders in global health practice, research, policy, and education.</p> <p>The Global Health Case Competition (IESGC) promotes student engagement, collaborative learning, and innovative problem-solving around critical global health issues.</p>	<ul style="list-style-type: none"> - Number of students who conduct global health projects abroad - Number of courses offered to support global health scholarship - Number of fellows who come to UVa to train and then return to their home institutions to become leaders in global health. - Number of collaborative publications and grants that result from IESG collaborations. 	<p>Donations.</p> <p>Grants.</p>
Global Health Institute at the University of Wisconsin–Madison	To advance equitable and sustainable health for people, animals, and ecosystems across Wisconsin and the world.	We embrace a new global health ethic that fosters a deeper understanding of the complex determinants of health and disease for people, animals, and ecosystems. In working locally and globally, we uniquely apply research and education both within and across disciplines, advancing health today and ensuring well-being for the future.	<ul style="list-style-type: none"> -Graduate professional certificate in global health -Graduate interdisciplinary field courses. -Medical Spanish. -Summer experiences Service-learning in Guatemala -Focus areas: health systems, health, climate, cities, one health, women, well-being, education. 	<ul style="list-style-type: none"> - Number of grants to faculty - Number of travel awards, - Number of scholar awards - Number of research awards - Number of countries represented in grants - Number of certificates awarded - Number of students who had international field experiences - Number of participants at events 	<p>From the University</p> <p>Donations.</p> <p>Grants.</p>

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
Institute for Global Health - UCL - London's Global University	Our vision is of a world in which interdisciplinary research creates solutions to global health challenges, stimulating policy change and better health for all.	Collaborate across disciplines to find solutions to global health problems. A cross-disciplinary approach is at the heart of our research and teaching, and we draw on the expertise of over 200 staff from across UCL. Health problems are influenced by the social environment as well as medical innovation. We seek solutions that address the social inequalities and determinants of health as well as the underlying medical problem.	Undergraduate program: - Global Health iBSc is a year-long course for integrating 3rd-year medical students. - Study abroad program. Postgraduate programs: - Masters of Science in Global Health and Development. - Masters of Science in Health Economics - Masters of Science in Applied Infectious Disease Epidemiology Postgraduate research degrees	- Number of graduates of their global health programs - Number of students who had field experiences - Number of publications - Number of grants attracted	Donations. Grants. Directly from the University.
McGill Global Health Program	To address health inequities and improve global health through education, research, and partnerships.	1. Offer high-quality education and training in global health and enhance capacity in resource-limited settings. 2. Facilitate and conduct innovative, interdisciplinary, collaborative, and policy-relevant research to address critical global health challenges and priorities. 3. Build strategic partnerships with major stakeholders and institutions in Canada and internationally, to exchange knowledge and skills, to ensure knowledge translation, and to support advocacy and implementation of policies.	- Global health courses - Global health summers - Training and workshops - Master of Science (M.Sc.) with a global health concentration - Doctor of Philosophy (Ph.D.) Epidemiology: Global Health - Global health nursing	- Number of publications - Number of certificates awarded - Number of grants attracted - Number of students trained	Donations. Philanthropic funds. Research grants. McGill products.

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
<p>The Social Innovation and Change Initiative (SICI) launched at the Harvard Kennedy School</p>	<p>We develop research, pedagogical content, and educational programs that help students, citizens, and organizations around the world, navigate the challenges of initiating and implementing social change. Through these core activities, we aim to illuminate the multiple paths social innovators can take to advance social progress across sectors.</p>		<ul style="list-style-type: none"> - Student Fellowship: program for change-makers committed to addressing pressing social problems in new and creative ways. - Visiting social innovators: engage in short, richly programmed visits to the Harvard campus during the academic year to build connections with and across communities to advance meaningful learning and catalyze action. - SICI Program: works with participants to help them to scale their social impact and influence broader systems beyond their direct constituents, beneficiaries, or customers. 	<ul style="list-style-type: none"> -Number of Fellows trained. - Number of events held 	<p>Donors. Philanthropic funds. Funds from HKS.</p>
<p>The Center for Policy Impact in Global Health, based at the Duke Global Health Institute</p>	<p>Targeted health policymakers, at national and global levels, make decisions informed by our work that improve the health of the poor.</p>	<p>To improve global health by addressing major strategic questions to inform evidence-based policy change.</p>	<p>Fellows program that provides a wide range of opportunities including academic coursework, research opportunities, participation in Duke University events, and a deeper and longer policy engagement after the end of the program.</p>	<ul style="list-style-type: none"> - Number of publications - Number of fellows trained 	<p>Donations Foundation, the Bill & Melinda Gates Foundation, The Duke Global Health Institute</p>

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
<p>Global Health Program of Chile's Salvador Allende School of Public Health</p>	<p>We seek to improve the services provided by public institutions to citizens, accompanying public servants and institutions in their processes of innovation centered on people, promoting that these practices become sustainable in the State and mobilizing the ecosystem to co-create public value in priority issues for the country.</p>	<p>To develop, coordinate, facilitate and promote innovation processes focused on people within public sector institutions, with the vision of basing these processes on the articulation of a new relationship of trust between citizens, the State, its officials, and the private sector. Focus on people, co-creation, systematic approach, experimentation, focus on the experience.</p>	<ul style="list-style-type: none"> - Global health classes. - Consulting services to co-construct solutions for public problems. 	<ul style="list-style-type: none"> - Number of solutions incubated - Number of solutions implemented - Number of people using the laboratory - Number of projects received - Number of alliances with other institutions 	<p>The Chilean government in association with civil society</p>
<p>Center for Global Health Hopkins</p>	<p>To facilitate and focus the extensive expertise and resources of the Johns Hopkins institutions together with global collaborators to effectively address and ameliorate the world's most pressing health issues.</p>	<ul style="list-style-type: none"> - Mpilohle: brings services to adolescents in rural South Africa with the objective of reducing the very high incidence of HIV and improving overall health. - Building an Enabling Environment for Vaccines in India (EEV12). - Identification and Enumeration of Pathogens in Drinking Water. - Nutrition Innovation Lab in Nepal 	<ul style="list-style-type: none"> - Seed grants to Hopkins faculty - Grants attracted 	<p>Gilead Foundation. Donations. Grants.</p>	

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
<p>Massachusetts General Global Health</p>	<p>To improve the health of the most vulnerable in our global community by leveraging Mass General’s 200-year legacy of innovation in medical care, education, and scientific discovery.</p>		<ul style="list-style-type: none"> - CAMTech: identifies clinical needs from the field, innovative solutions and accelerates the cycle from idea to patient impact. - Thomas S. Durant Fellowship: sponsoring healthcare to serve refugee populations and victims of humanitarian disasters. - Global disaster response: provide a professional response to those affected by disasters. - Global Health Research - Global Medicine Program: partnerships to create trainee service, teaching, and research opportunities, both locally and globally. - Global nursing: provides nursing education with immersive experiences 	<ul style="list-style-type: none"> - Number of publications - Number of certificates - Number of grants attracted - Number of students trained 	<p>Global Health Collaborative.</p> <p>Harvard University.</p> <p>Seed Global Health.</p> <p>Partnerships.</p> <p>Donations.</p>
<p>Duke Global Health Institute</p>	<p>Academic excellence to meet the global health challenges of today and tomorrow to achieve health equity worldwide.</p>	<ul style="list-style-type: none"> - Become the world leader in interdisciplinary global health education. - Catalyze and conduct interdisciplinary and innovative research to respond to the global burden of disease and influence policy. - Create a robust network of international partners to exchange global health knowledge and skills. 	<ul style="list-style-type: none"> - The Duke Master of Science in Global Health - Global health pathway for residents and fellows - Field research - Doctoral certificate - Courses - Faculty grants 	<ul style="list-style-type: none"> - Number of publications - Number of grants attracted - Number of students trained - Number of certificates offered 	<p>Donations</p> <p>University funding.</p> <p>Subscriptions.</p>

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
<p>University of California Global Health Institute</p>	<p>The UC Global Health Institute (UIESGI) is a UC-wide initiative that stimulates, nurtures, and promotes global health research, education, and collaboration to advance health in California and worldwide. UIESGI brings together the health and non-health sciences to tackle increasingly complex global health problems.</p>	<p>- UIESGI advances the mission of the University of California to improve the lives of people in California and around the world. - UIESGI leverages the diverse expertise across the University to revolutionize training of future global health leaders and accelerate the discovery and implementation of transformative global health solutions.</p>	<ul style="list-style-type: none"> - Research projects - Undergraduate education at multiple centers - Professional, graduate and postdoctoral education <ul style="list-style-type: none"> - Junior Faculty Opportunities - Education Resources - Fellowships 	<ul style="list-style-type: none"> - Number of newborns and mothers benefited from the programs - Number of beneficiaries of interventions in the fight against HIV. - Number beneficiaries, in general, from the projects carried out. 	<p>Donations.</p> <p>Directly from the University.</p>
<p>Institute for Global Health Sciences (UCSF)</p>	<p>To improve health and reduce inequities locally and globally.</p>	<p>We solve global health problems by:</p> <ul style="list-style-type: none"> -Applying high-quality scientific evidence to inform health policies and practices. - Training future leaders in global health. - Building the capacity of our implementing partners. 	<ul style="list-style-type: none"> - Master's program in Global Health - PhD - Online courses - Global Health Certificate - Summer researchers in Global Health - Short Courses and training opportunities (biostatistics, data management, epidemiologic surveillance, etc.) - Research projects 	<ul style="list-style-type: none"> - Number of students trained - Number of publications - Number of grants attracted 	<p>Grants from international agencies (USAID, Bill and Malinda Gates Foundation, STOP TB).</p> <p>Directly from the University.</p>

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
<p>Harvard Innovation Lab</p>	<p>We are an innovation ecosystem that exists to support Harvard students and select alumni in their quest to explore the world of game-changing entrepreneurship. What we offer. We unleash the innovative power of individuals through a network of highly-curated advisors and mentors, peer collaboration and interaction, and comprehensive resource and programming support.</p>		<p>The i-lab, a dynamic, full-service space for current Harvard students interested in actively pursuing innovation and entrepreneurship. Launch Lab X, a groundbreaking new accelerator inside the i-lab for eligible Harvard alumni leading promising early-stage startup ventures.</p>	<ul style="list-style-type: none"> - Students served - Number of startup ventures 	<p>The University.</p>
<p>Eck Institute for Global Health - University of Notre Dame</p>	<p>To holistically address health disparities around the world.</p>	<p>Training the next generation of global health researchers and leaders through undergraduate, Master of Science in Global Health, doctoral, and postdoctoral programs.</p>	<ul style="list-style-type: none"> - Research projects - PhD - Master of Science in Global Health. <p>Undergraduate programs:</p> <ul style="list-style-type: none"> - A course of Foundations in Global Health. - Notre Dame Global Health Case Competition. - International Summer. - Service Learning Program - Interactions with Undergraduate Clubs that focus on Global Health. 	<ul style="list-style-type: none"> - Number of students trained - Number of students who had a field experience 	<p>Donations.</p>

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
Rice 360° Institute for Global Health	<p>We innovate for global impact: We discover and evaluate the biological and social factors that give rise to global health inequities. We design scalable solutions to address unmet health needs around the world. We educate multidisciplinary leaders who can solve complex global challenges. We partner with local and international stakeholders to thoughtfully test and implement these innovative solutions. We transform students into innovators and ideas into sustainable solutions.</p>	<p>- Rice 360 Global Health Fellows - Global Health Technologies Summer Internship Program - Undergraduate students first-hand exposure to healthcare in resource-constrained settings. - Global Health Design Competition. - NEST 360° - Day One Project</p>	<p>- Number of students who had field experiences - Number of international students who came for a field experience to the US - Number of students who took global health courses - New technologies developed - Scholarships and fellowship awarded</p>	<p>Foundations Government grants University funding</p>	
Harvard Global Health Institute	<p>There are still many things that divide us, but global health has the potential to be the great equalizer – a set of challenges and solutions in which we all have a stake. Shared efforts to improve global health can not only unite us, but they also have the potential to improve lives on a global scale. The Harvard Global Health Institute is committed to surfacing and addressing broad challenges in public health that affect large populations around the globe. We believe that solutions that will move the dial draw from within and beyond the medicine and public health spheres to encompass design, law, policy, and business. We do that by harnessing the unique breadth of excellence within fields at Harvard and by being a dedicated partner and convener to organizations, governments, scholars, and committed citizens around the globe.</p>	<p>- The Healthy Cities Initiative at Harvard will function as a hub of inquiry and new solutions to the most pressing health challenges facing cities. - The Burke Global Health Fellowship for Harvard junior faculty - Seminar Series - Fellowships to graduate and undergraduate Harvard Students</p>	<p>- Number of students who had a field experience - Number of applicants for field experience - Number of publications - Seed grants awarded to faculty - Number of events held</p>	<p>Harvard University</p>	

Table 3. (Continued)

Institution	Vision	Mission	Key Programs	Success Indicators used	Funding Sources
<p>University of Global Health Equity Rwanda</p>	<p>A world where every individual—no matter who they are or where they live—can lead a healthy and productive life.</p>	<p>To radically change the way healthcare is delivered around the world. We’re reimagining health education to ensure that quality healthcare reaches every individual in every corner of the globe.</p>	<p>- A Bachelor of Medicine: 6 years and a half years coupled with a master's level global health degree.</p> <p>- A Master of Science in Global Health Delivery: problem based and experiential learning, addressing social problems, leadership and management.</p>	<p>- Number of students graduated</p>	<p>Cummings Foundation and the Bill and Melinda Gates Foundation.</p> <p>Partners in Health.</p> <p>Government of the Republic of Rwanda.</p>
<p>BRAC James P. Grant School of Public Health</p>	<p>To be the leading global public health institute for the world’s critical health challenges affecting disadvantaged communities.</p>	<p>To create innovative public health leaders and solutions through cutting-edge, experiential education, training, research and advocacy.</p>	<p>Masters in Public Health - 12 month full time programme</p> <p>Internship Program- the length varies from weeks to half a year or longer, with a social laboratory</p> <p>Online courses: How to give a talk, basic quantitative and qualitative research methods.</p>	<p>- Number of professionals trained</p> <p>- Number of publications</p> <p>- Number of partnerships</p>	<p>BRAC, BRAC University, ICDDR</p>

Table 4. Latin American Alliance for Global Health Member Institutions (ALASAG)

Institution	Country	Academic programs
The National Institute of Public Health in México	México	<ul style="list-style-type: none"> ● Master of Public Health - General Program. ● Master in Quality Management in Health Services. ● Continuing Education in Public Health, Epidemiology, Health Management, Economics, Systems, and Health Policy. ● Specialty In Comprehensive Evaluation Of Social Development Programs and Policies. ● Doctorate In Public Health and Doctorate In Sciences In Environmental Health
Dr. Salvador Allende School of Public Health in Chile	Chile	<ul style="list-style-type: none"> ● Public Health Specialist. ● Master in Public Health. ● Ph.D. in Public Health. ● Master in Health Administration. ● Courses in policies and management in health, environmental health and health and community.
University of Costa Rica School of Public Health	Costa Rica	<ul style="list-style-type: none"> ● Academic Master in Public Health. ● Professional Master in Public Health. ● Professional Master's Degree in Public Health with emphasis on Environment and Human Development. ● Professional Master's Degree in Public Health with an emphasis on studies of Adolescence and Youth. ● Professional Master's Degree in Public Health with an emphasis on Health Management. ● Professional Master in Public Health with an emphasis in Health Policy Management.
The School of Public Health and Administration from the Universidad Peruana Cayetano Heredia	Peru	<ul style="list-style-type: none"> ● Second Specialty in Health Services Management. ● Diplomas in administration, auditing, project design, comprehensive care, among others. ● Master in Public Health and Global Health. ● Master in Health Management. ● Ph.D. in Public Health.

Table 4. (Continued)

Institution	Country	Academic programs
School of Public Health at University of São Paulo	Brazil	<ul style="list-style-type: none"> ● Postgraduate In Public Health. ● Postgraduate In Global Health And Sustainability. ● Master In Environment, Health, And Sustainability.
State University of Rio de Janeiro	Brazil	<ul style="list-style-type: none"> ● Postgraduate In Food, Nutrition, And Health. ● Postgraduate In Medical Sciences. ● Postgraduate Degree In Environment. ● Master In Collective Health.
Oswaldo Cruz Foundation	Brazil	<ul style="list-style-type: none"> ● There are currently 32 programs in ten evaluation areas of the Coordination for Improvement of High-Level Education Personnel (Capes)
ISalud University	Argentina	<ul style="list-style-type: none"> ● Master In Health And Social Security Systems. ● Master In Economics And Health Management. ● Specialization In Economics And Health Management. ● Master In Health And Social Security Systems. ● Master In Economics And Health Management. ● Specialization In Economics And Health Management.
National School of Public Health “Héctor Abad Gómez” Antioquia University	Colombia	<ul style="list-style-type: none"> ● Ph.D. In Public Health. ● Master In Hospital Administration. ● Master In Epidemiology. ● Master In Public Health. ● Master In Collective Health.
University of the North	Colombia	<ul style="list-style-type: none"> ● Master in Epidemiology. ● Master in Clinical Epidemiology. ● Master in Public Health. ● Global health Research Area.

Table 5. Differences between tropical medicine, international health and global health

Type	Tropical Medicine (1500-1851)	International Health (1851-1990)	Global Health (1990-present)
Approach	Based on microbes. Miasma theory	Protecting wealthy countries from pandemics	Based on downstream and upstream actions
Key tool for prioritizing	Mortality and its effects in trade	Mortality and its effect on business	Social equity, which means to prevent and limit all the unfair health disparities
Focus on	Isolation (pre-antibiotic era). The individual	Countries and medical treatments	Economic, social, and political context. Disease as a social result. Based on inter and transdisciplinary efforts
Decision-makers	Aristocracy (companies owners)	Bureaucrats, technocrats and elites	People through social activism and advocacy
Legal frame	None	International codes and norms	Right to health and human dignity
Motives	Exploitation of labor	International trade	Solidarity, collaboration and global equity
Key science for production and reproduction of knowledge	Biological sciences	Epidemiology and behavioral sciences	Political and social sciences
How practitioners are seen	Scientifics	Protectors of people's health	Protectors of people's health and organizers
Production of health in a larger scale	Avoiding microbes	Avoiding epidemics	Creating social structures that produce health
Health threats	Communicable diseases	Communicable diseases + NCDs	Communicable diseases + NCDs+ conflicts + global warming + successes/failures of PH, technology caused diseases = complexity

(Birn, 2009; Fried et al., 2010; Koplan et al., 2009; Ooms, 2014; Peters, n.d.)

Appendix C. Internal stakeholders survey responses

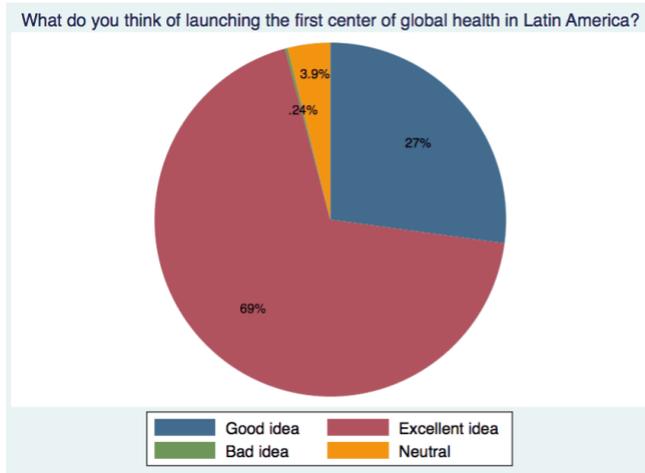


Figure 10. Survey response. Launching a IESG in Latin America

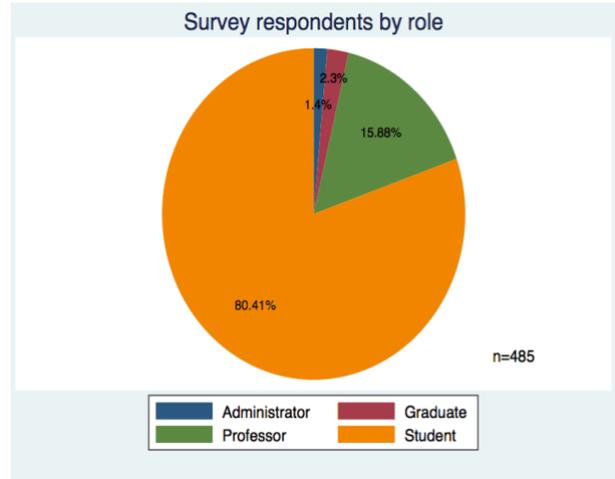


Figure 9. Survey respondents by role

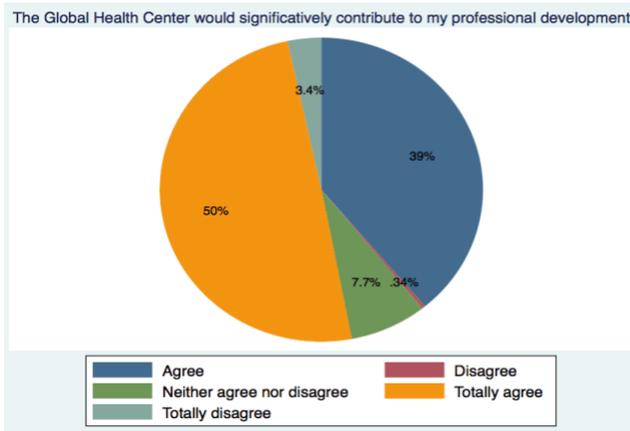


Figure 6. Survey responses. Global health contribution to professional development

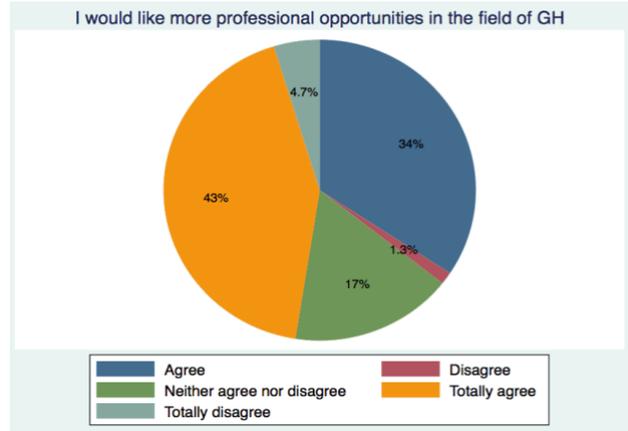


Figure 8. Survey response. Global health opportunities

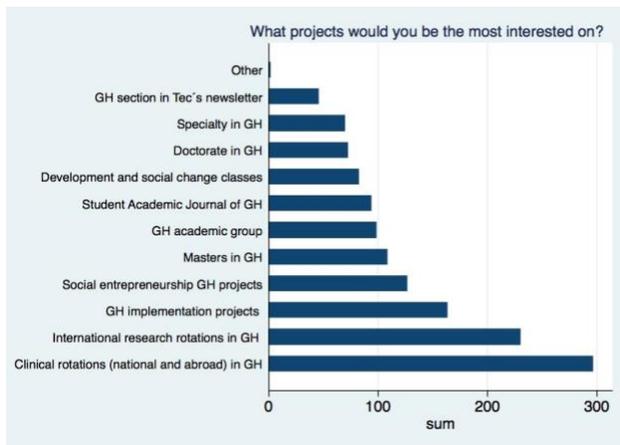


Figure 7. Survey response. IESG projects preferences

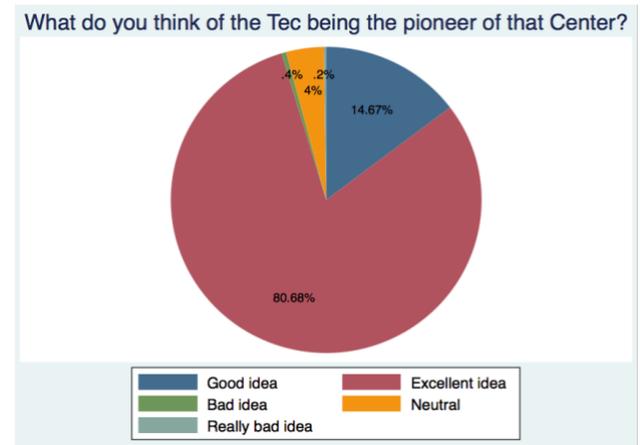


Figure 5. Survey response. IESG at Tec

Table 6. Budget projection IESG

FY	2020	2021	2022	2023	Total
Income					
Seed funding by Tec	\$315,789	\$157,895	\$78,947	\$38,000	\$590,632
Donations and grants	\$0	\$52,632	\$68,421	\$89,474	\$210,526
Consultancies	\$0	\$0	\$36,842	\$42,105	\$78,947
Academic programs	\$13,158	\$23,684	\$68,421	\$110,526	\$215,789
New technologies licenses	\$0	\$0	\$52,632	\$78,947	\$131,579
<i>Total income</i>	\$328,947	\$234,211	\$305,263	\$359,053	\$1,227,474
Direct costs. Variable					
Travel	\$5,263	\$7,895	\$15,789	\$21,053	\$50,000
Supplies	\$2,105	\$3,158	\$3,684	\$4,211	\$13,158
<i>Costos directos variables Total</i>	\$7,368	\$11,053	\$19,474	\$25,263	\$63,158
Direct costs. Fixed					
Salaries	\$75,789	\$126,316	\$202,105	\$252,632	\$656,842
Infrastructure	\$131,579				\$131,579
Work equipment and furniture	\$26,316	\$1,579	\$1,579	\$1,579	\$31,053
Events	\$26,316	\$26,316	\$52,632	\$52,632	\$157,895
Internal research grants	\$5,263	\$9,211	\$10,526	\$21,053	\$46,053
<i>Total fixed costs</i>	\$265,263	\$163,421	\$266,842	\$327,895	\$1,023,421
Total direct costs	\$272,632	\$174,474	\$286,316	\$353,158	\$1,086,579
Indirect					
Services and administrative costs	\$3,158	\$4,211	\$4,737	\$5,263	\$17,368
Indirect cost total	\$3,158	\$4,211	\$4,737	\$5,263	\$17,368
Total costs	\$275,789	\$178,684	\$291,053	\$358,421	\$1,103,947
Anual Balance (income- total cost)	\$53,158	\$55,526	\$14,211	\$632	\$123,526
Accumulated balance	\$53,158	\$108,684	\$122,895	\$123,526	

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