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Global Health Governance

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THE JOURNAL PROVIDES INTERDISCIPLINARY ANALYSES AND A VIGOROUS EXCHANGE OF PERSPECTIVES THAT ARE ESSENTIAL TO THE UNDERSTANDING OF THE NATURE OF GLOBAL HEALTH CHALLENGES AND THE STRATEGIES AIMED AT THEIR SOLUTION. THE JOURNAL IS PARTICULARLY INTERESTED IN ADDRESSING THE POLITICAL, ECONOMIC, SOCIAL, MILITARY AND STRATEGIC ASPECTS OF GLOBAL HEALTH ISSUES.

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Chinese Global Health Diplomacy in Africa: Opportunities and Challenges

Olivia J. Killeen, Alissa Davis, Joseph D. Tucker, and Benjamin Mason Meier

China has become a key actor in global health diplomacy, particularly in Africa, but little attention has been given to the evolution of Chinese health assistance to African states. This paper conceptualizes Chinese health diplomacy in Africa over the past fifty years through three analytic frameworks: realist vs. constructivist motivations in international relations, vertical vs. horizontal initiatives for health assistance, and bilateral vs. multilateral approaches to global health. Drawing lessons from the evolution of American health assistance, we argue that a better understanding of these frameworks—recognizing why countries pursue health diplomacy, what vertical and horizontal strategies they use, and how they engage in this work bilaterally or multilaterally—could improve global health diplomacy.

INTRODUCTION

As globalization has intensified since the mid-20th century—impacting an increasing array of communicable and non-communicable diseases[1]—global health diplomacy has become a crucial tool for addressing global health threats. Global health diplomacy refers to the policymaking processes through which state and non-state actors respond to global health challenges within and beyond the health sector.[2] It can encompass numerous actors and relationships, such as official international negotiations between states, collaborations between states and multilateral organizations, and interactions among governmental and nongovernmental stakeholders.[3] Health diplomacy has been increasingly emphasized at United Nations (UN) and World Health Organization (WHO) forums, bringing together state and non-state actors across the global health landscape.[4, 5] Beginning in 2008, WHO Director-General Margaret Chan lauded "this new era of global health diplomacy" and encouraged diplomats, public health experts, and academic institutions to "embed the use of the health lens in foreign policy."[5]

While China's engagement in global health has received both praise and criticism in recent years,[6] little attention has been given to Chinese global health diplomacy efforts across African nations, where the Chinese government has come to invest substantial political, financial, and human resources to improve public health. Given changing alignments in international relations,[7] understanding Chinese health diplomacy in Africa is increasingly important. This article explores opportunities and challenges for Chinese health diplomacy in Africa. We start by introducing three analytic frameworks for conceptualizing global health diplomacy, contrasting realist and constructivist motivations in international relations, vertical and horizontal initiatives in health assistance, and bilateral and multilateral approaches to global health. Next we apply these frameworks to Chinese health diplomacy in Africa from the 1960s to the present and provide empirical data on several recent Chinese health projects in a number of African nations. We compare these recent Chinese efforts to evolving American health diplomacy since the end of World War II, highlighting a model of health engagement that contrasts in many ways with the Chinese model. In doing so, we discuss the need for developing a rigorous comparative research agenda into why countries pursue health diplomacy, what vertical and horizontal strategies they use, and how they engage in this work bilaterally or multilaterally. Through such a systematic evaluation, it becomes possible to gauge the effectiveness of global health diplomacy initiatives and to establish good policy practices. We conclude that by understanding the diverse justifications for health aid, leading donor states can combine effective vertical and horizontal approaches to multilateral and bilateral health aid into a

more integrated strategy that can strengthen national health systems while addressing global health challenges.

THEORETICAL FRAMEWORKS FOR ANALYZING HEALTH DIPLOMACY

In this article, we (a) apply realist and constructivist paradigms to explain *why* China has pursued health diplomacy in Africa, (b) contrast vertical and horizontal models of health aid to analyze *what* Chinese assistance has sought to achieve in African nations, and (c) delineate bilateral and multilateral initiatives in global health to explore *how* China is carrying out its global health agenda. Comparing the motivations, initiatives, and approaches of Chinese and U.S. health diplomacy in Africa, we highlight distinctions within these three theoretical models and reflect on larger trends in global health diplomacy.

Analyzing health diplomacy efforts through the lens of international relations, operationalized through realist and constructivist frameworks, helps to better understand the motivations that drive states to engage in global health diplomacy. In the realist view of international relations, state actions are driven by the pursuit of power. Under this framework, a state's global health diplomacy is seen to promote its own national interests, with disease prevention serving as a means of protecting national security and economic power.[8] In contrast, constructivist theory holds that shared ideals and values—norms that are independent of national interests—hold influence in international relations. In this view, which influenced the post-war development of WHO, health exists in a larger framework of global justice, with norms for human rights and global justice seen as an end in themselves.[8] These theories of international relations can help explain the motivations behind global health efforts, with both realist and constructivist theory framing health diplomacy.

When viewing the specific initiatives in global health diplomacy, it is also useful to conceptualize health diplomacy under a framework of horizontal and vertical assistance. The vertical approach is a top-down strategy that targets individual diseases for control and elimination. This model favors one-time treatments and biomedical interventions, like vaccines, to achieve measurable targets. The results of such vertical endeavors are often easily quantifiable, like the number of vaccines administered or the number of mosquito nets distributed.[9] The horizontal approach, by contrast, aims to improve the health of populations through comprehensive initiatives targeting the underlying societal-level issues and systems contributing to health. While horizontal health assistance can have greater long-term impacts on the public's health, it can be difficult to measure the short-term impact of preventative systems and upstream determinants of health.[9]

Finally, in understanding how nations engage in health diplomacy, it is important to differentiate between bilateral and multilateral approaches in global health. The largest donor states primarily use their own bilateral aid agencies to distribute foreign aid.[10] Under bilateral initiatives provided directly between two nations, donor states retain complete control over their own foreign policies, allowing them to maximize the political credit accruing from foreign aid. Given the development of global governance institutions, however, many states have come to channel part of their foreign aid through multilateral organizations like the World Bank, UN, and regional development banks.[10] While limiting the direct political control and political utility of such aid, even the most powerful states pursue multilateral initiatives[11] when the international organization's objectives parallel those of the state.[12] Delegating authority to international organizations can reduce transaction costs[10, 13] by taking advantage of the organizational legitimacy and bureaucratic staff of international organizations to carry out global health initiatives.

Because global health diplomacy is increasingly complex, encompassing numerous actors with varied motivations undertaking a range of initiatives in diverse contexts, these theoretical frameworks can conceptualize understanding of Chinese health diplomacy across African states.

EVOLVING CHINESE INVOLVEMENT IN AFRICAN HEALTH SYSTEMS

1948-1978

When the People's Republic of China (PRC) was established in 1949, the government faced a weak health infrastructure, widespread malnutrition, and infant mortality over 25%,[14] but large policy changes in the following decade briefly improved domestic public health. Four principles that shaped this transformation were announced at the PRC's First National Health Congress in 1950: medicine should serve laborers, peasants, and soldiers; preventative medicine should be the foundation of healthcare; traditional Chinese and Western medicine should be integrated; and health interventions should focus on broad public health initiatives.[14] These principles led to near universal provision of community-based primary health care. Horizontal health programs like community immunization, anti-schistosomiasis campaigns, elimination of disease-causing pests, and closure of brothels resulted in marked decreases in infectious diseases and improvements in public health.[14]

From this domestic health policy foundation, health diplomacy gained importance in the PRC's bilateral foreign policy agenda in the 1960s as the PRC remained isolated from the global community, excluded from multilateral forums like the UN and WHO. The WHO was founded in 1948, with Chinese Nationalist diplomat Szeming Sze having served as one of the key architects of the WHO Constitution.[15] Despite the establishment of the PRC the following year, the WHO continued to recognize the Republic of China (ROC), the Nationalist government in Taiwan, as the legitimate government of China. Despite repeated PRC efforts to argue that the ROC was not the legal government of China and should never have been a member state of the WHO, the states of the World Health Assembly (WHA) continued to recognize the ROC as the sole government of China until 1972.[16] With the Soviet Union and Eastern European states having temporarily withdrawn from the WHA in the late 1940s, there were no communist states to advocate on behalf of the PRC,[16] and the PRC was effectively excluded from all multilateral health governance.

China's rifts with the Soviet Union and U.S. during this period only added to its isolation in international affairs. By 1961, the Sino-Soviet political relationship had deteriorated due to ideological disagreements, and China and the U.S. were openly aiding opposing military forces in Vietnam.[17] With both the Soviet Union and the U.S. independently seeking to contain China's international influence, the dueling Cold War superpowers each sought deeper relationships with India as a counterbalance to Chinese power in the region.[18] Given increasing American and Soviet engagement in Africa in the 1960s,[19-21] China was competing with both the American "imperialists" and the Soviet "revisionists" for African support of Chinese political goals.[20] As Chinese Premier Zhou Enlai explained in 1964, "Our assistance to Asian and African countries is keenly important for our competition with the imperialists and revisionists for the middle strip. This is a critical link. It is the material assistance. It will not work without material."[20]

During this period when China was "striking with both fists,"[20] at both the U.S. and Soviet Union, it was also reeling from the regressive effects of the "Great Leap Forward" of 1958-1960. Industrial and agricultural reforms under the Great Leap Forward had led to intense domestic struggle and famine.[14] Between 20 and 50 million people died of starvation, and infant mortality rose again.[14] While rural commune clinics offered free care, the quality of care varied greatly between communes.[22] In cities, the Ministry of Health controlled health policy, emphasizing the utility of basic medical clinics and restricting the access of urban populations to more advanced referral centers.[22, 23]

It was in the midst of these political and economic shifts that China made its first foray into global health diplomacy in Africa. China launched its health assistance in Africa in 1963 in response to newly-independent Algeria's call for foreign aid to bolster its fractured medical system. Chinese Premier Zhou Enlai sent a team of Chinese health care

providers to Algeria.[24] With 13 Chinese health care practitioners providing direct care to Algerian patients,[25] and serving as a tangible international expression of communist solidarity, this represented China's first medical mission to any country in modern history.[26]

China's first medical mission coincided with the first top-level PRC delegation to visit Africa. During this 10-country tour, the Chinese delegation, led by Premier Zhou, emphasized that China and African countries were united together as developing nations, sharing common enemies like the European colonial powers and later the Soviet Union and United States.[19] In drawing on their similar histories, China sought to enlist African nations in mutual support: to protect their sovereignty, build their economies, and promote world peace.[27] During this 1963-4 tour of Africa, Zhou announced Eight Principles of Chinese Aid:

1. *China always bases itself on the principle of equality and mutual benefit in providing aid to other nations;*
2. *China never attaches any conditions or asks for any privileges;*
3. *China helps lighten the burden of recipient countries as much as possible;*
4. *China aims at helping recipient countries to gradually achieve self-reliance and independent development;*
5. *China strives to develop aid projects that require less investment but yield quicker results;*
6. *China provides the best-quality equipment and materials of its own manufacture;*
7. *In providing technical assistance, China shall see to it that the personnel of the recipient country fully master such techniques;*
8. *The Chinese experts are not allowed to make any special demands or enjoy any special amenities.*[28]

In the context of the PRC's ongoing rift with the WHO and isolation from multilateral health initiatives,[16] these Eight Principles would serve as a blueprint for bilateral health aid.

From a realist perspective, Chinese health aid from 1949-1978 was ultimately a tool to achieve Chinese foreign policy goals.[29] Following the Sino-Soviet rift of the early 1960s, Chinese health diplomacy in Africa sought to limit the political influence of the Soviet Union in Africa, minimize Soviet involvement in African liberation movements, and later bolster national security after the 1969 clashes on the Chinese-Russian border.[30] Chinese health diplomacy also helped to secure international recognition of the PRC as the legitimate government of China. As post-colonial African states came to make up approximately 30% of votes in the UN,[30] PRC assistance to Africa in the 1960-70s strengthened African state support for the PRC's international recognition vis-à-vis the Nationalist government in Taiwan,[20] with 26 African states in the UN General Assembly voting successfully in 1971 to recognize the PRC as the legitimate government of China.[31, 32] Following the PRC's assumption of the Chinese seat in the UN, the World Health Assembly also voted to recognize the PRC as the legitimate government of China, giving China a new role in multilateral global health diplomacy.[33]

Seen through a constructivist lens, norms of equality and justice also run through China's early health aid to Africa, competing with realist power politics as the motivation for Chinese health diplomacy. Driven by communist notions of solidarity, China provided health assistance to Africa even when domestic resources were limited.[20] The emphasis on "mutual benefit" in Zhou's Eight Principles signified equality between China and African states (in contrast to Western postcolonial aid relationships between generous donors and needy recipients), signifying a true partnership and political bond.[34] Constructivism also helps to clarify China's motives in pursuing unconditional aid through global health diplomacy. While Western health aid was explicitly conditioned on the recipient nation adopting specific economic reforms, often seeking the liberalization of economic systems,[35]

placing such conditions on ideological comrades was antithetical to communist principles and state sovereignty, with China supporting health initiatives that were driven by the priorities of the recipient governments themselves.[21]

China's health assistance from 1948-1979 was predominantly devoted to horizontal initiatives, aiming to strengthen African national health systems, including access to medicines, hospitals, and infrastructure.[21, 36] While Western donors often provided financial support for disease-specific interventions, China favored in-kind aid to governments, including personnel, equipment, and logistical support.[21] Such in-kind support was in line with its horizontal approach to health while simultaneously reflective of China's limited financial resources following the Great Leap Forward; with its own economy disrupted, it was more feasible for China to send physicians and tools rather than financial assistance.[21] Chinese medical teams, like the first one sent to Algeria in 1963—and similar to the contemporaneous rise of Cuban health brigades[37]—became a hallmark of Chinese health diplomacy. These teams treated African patients but also focused on building sustainable local capacity, training healthcare personnel, and constructing hospitals.[38] In a follow-up visit to Zanzibar in 1965, Zhou emphasized the need to train local physicians so that even after Chinese medical teams departed, they would "leave a medical team which would never go away" and "thus support the liberation cause of African people."[31] The medical team program was structured to facilitate long-term partnerships, with specific Chinese provinces sending medical teams to designated African nations. For example, China's Hubei province has remained responsible for the dispatch of medical teams to Algeria since 1963.[31] These arrangements, as depicted in figure 1, fostered close connections between African-Chinese partner communities[39] and facilitated long-term, horizontal health system strengthening.

With its membership in the UN and WHO, China would seek to expand its leadership in multilateral health initiatives. Building from the PRC's shift toward universal basic primary care in 1951, China had reformed its national medical education system to develop so-called 'barefoot doctors'—farmers with short-term medical training who could provide primary care services within their home villages.[41] This horizontal initiative provided basic health services to the majority of Chinese people and significantly improved national public health indicators. The Chinese government sought to proclaim this success globally, and WHO would afford it the opportunity to share its model with the world. One year after China became a member of the WHO, WHO Director-General Halfdan Mahler, who spearheaded a horizontal model of universal primary care, requested in 1973 that the WHO conduct research on primary care initiatives in nine countries, including China.[32] China's domestic health care program became an influential model for the 1977 World Health Assembly's resolution on Health for All by the Year 2000 and the subsequent 1978 Alma-Ata Declaration on Primary Health Care, which emphasized a paradigm of universal, comprehensive primary care.[41, 42] Yet, China's international rivalries would continue to limit its multilateral health diplomacy, with China failing to attend the Alma-Ata Conference in the Soviet Union even as its health system served as a model for the Conference's primary health care discussions.

1978-1990s

By the late 1970s, China again looked inward in addressing domestic political upheavals and economic struggles following the Cultural Revolution. Chinese leader Deng Xiaoping initiated sweeping economic reforms in 1978 to attract foreign investment and promote growth.[35] Shifting toward vertical programs in the national health system, market elements were introduced into health care, central government funding decreased, free primary care was replaced with fee-for-service models, new pricing structures allowed profit from drugs and technology, and private and work-based insurance models were introduced.[43, 44] While

economic development blunted a downturn in public health indicators,[44] these vertical healthcare reforms led to greater inequity in access to healthcare services and ultimately eliminated China's horizontal system that had been a model for the Declaration of Alma-Ata.

Figure 1: Chinese propaganda poster from 1972 depicting Chinese and African physicians working side by side to serve African patients. The text translates to "The feelings of friendship between the peoples of China and Africa are deep."[40]

With China's prioritization of the domestic economy and the West's imposition of a neoliberal agenda in African nations, there was a realignment of China's health goals and a dampening of Chinese health engagement in Africa from 1979 through the 1990s.[31, 35] Focusing its resources on domestic economic priorities rather than bilateral health diplomacy, no new Chinese medical teams were sent to Africa from 1979 to 1980, and the total number of Chinese medical teams in Africa had decreased by 1982.[31] Rather than focusing its foreign diplomacy on health, China's engagements in Africa came to be oriented toward trade, service contracts, and investments.[20, 30] In December 1982, Premier Zhao Ziyang visited 11 African nations to redefine China's relationship with Africa in light of its new domestic development goals.[30] Through Zhao's "Four Principles on Sino-African Economic and Technical Co-operation," he emphasized economic development, with joint ventures serving as the new cornerstone of the China-Africa economic relationship.[30] Shifting from constructivist to realist explanations for Chinese global health diplomacy, China's relationship with Africa in the 1980s came to be structured around China's domestic development needs, and supporting African health systems was no longer seen to serve China's economic interests.

Neoliberal economic reforms in the 1980s and 1990s promoted vertical health care reforms in African nations and further contributed to a decrease in bilateral Chinese assistance to African health systems. In the aftermath of the global economic crises of the late 1970s, the International Monetary Fund (IMF) and World Bank offered loan packages to debt-burdened African nations that were conditional upon these nations undergoing structural adjustments to "liberalize" their economies – reducing government intervention and promoting free markets.[45] In restructuring health systems, this entailed eliminating government subsidies for health care, charging user fees for utilizing health care, and selling state-owned health assets to the private sector.[45] Similar to Chinese domestic reforms, these neoliberal policies shifted the global healthcare movement away from the horizontal, universal primary healthcare paradigm of the Declaration of Alma-Ata and toward a more vertical model focusing on a small number of diseases and a measurable set of targets.[46] The neoliberal restructuring of African national health systems toward vertical health interventions was incompatible with China's horizontal approach to bilateral public health assistance.[47] Despite continuing cooperation in scientific research on medicinal plants, with African governments looking to China as a model for how to incorporate traditional healing and Western medicine into unified health systems, there remained a sharp downturn in Chinese aid to African health systems.[48]

2000s-present

The 21st century, however, has brought renewed Chinese engagement with African health systems, with Chinese Foreign Minister Li Zhaoxing outlining this new engagement in the 2006 whitepaper *China's African Policy*.[49] Promising new frameworks for modern China-Africa relations, *China's African Policy* is based on a renewed set of constructivist justifications for a new series of horizontal programs through a variety of bilateral and multilateral relationships.

Seen through constructivist norms of solidarity, the foreword of *China's African Policy* describes the evolving relationship between China and Africa—respectively the "largest developing country in the world" and the continent encompassing "the largest number of developing countries"—as based upon mutually-beneficial cooperation. It evokes Africa's history of overcoming colonization and a shared historical struggle for national liberation.[49] As with the Zhou's 1963 Principles of Chinese Aid, *China's African Policy* outlines shared principles underlying China-Africa assistance, including equality, sovereignty, and mutual benefit.[49] In the spirit of sustainable development (combined with realist justifications for supporting those states that adhered to the "One-China Policy," discussed below), this new Policy pledges to support African national efforts to enhance government capacity in areas of education, science, culture, and health.

Returning to horizontal support for national health systems, *China's African Policy* seeks to increase Chinese financial assistance to African governments without any explicit political conditions.[49] In medical and health cooperation, the 2006 Policy commits to enhancing the exchange of medical personnel and information between China and African nations, reestablishing medical teams along with medicines and equipment, building and improving health care facilities, and training domestic medical personnel. It emphasizes investments across infectious diseases, including HIV and malaria, and promises increased exchanges focused on Chinese traditional medicine and emergency medical responses.[49]

While *China's African Policy* pledges Chinese support for African nations in multilateral organizations,[49] it continues to focus principally on bilateral relationships to support national health systems. Harkening back to its early tensions with WHO, China's continuing aversion to multilateral health diplomacy stems in part from ongoing tensions with the WHO over the status of Taiwan. Although political pressure from Beijing had led

to the exclusion of Taiwan from the WHO until 2009,[35] the "Taiwan question" arose annually in the World Health Assembly from 1997 to 2009.[33] With select states calling for the "Republic of China" to be admitted to the WHO as an observer nation, this longstanding dispute in the World Health Assembly undermined Beijing's "One-China Policy," the idea that Taiwan is part of China rather than a sovereign state.[50] Given this recurring insult to Chinese national identity, China turned away from the WHO as a multilateral forum for its global health diplomacy, seeking bilateral health diplomacy with African states. The importance of the One-China Policy is apparent in realist justifications for *China's African Policy*, which explicitly states that the "one China principle is the political foundation for the establishment and development of China's relations with African countries" and offers appreciation for "the overwhelming majority of African countries [that] abide by the one China principle, refuse to have official relations and contacts with Taiwan and support China's great cause of reunification."[49]

With China's new vision for health diplomacy announced in association with high-level delegations to Africa, *China's African Policy* in 2006 is based on parallel frameworks to the Eight Principles of Chinese Aid in 1964, with both emphasizing: constructivist norms of kinship between developing nations; horizontal efforts to promote African capacity-building;[28,49] and bilateral initiatives over global health governance. Notwithstanding the similarities across these frameworks, the commitments presented in *China's African Policy* represent an unprecedented expansion of global health assistance to Africa. Chinese grant-making in the African health sector increased from $1.54 billion USD in 2004-2008 to $3.8 billion USD in 2009-2013, with most grants going toward infrastructure, equipment, medicine, and medical teams.[51] From 2010 to 2012, nearly 52% of China's foreign aid went to Africa.[38] While such figures are helpful in understanding the magnitude of Chinese health assistance to African states, it is important to note that such quantitative analysis is limited by a lack of transparency in Chinese data reporting, as seen where monetary information is only available for 26% of grant-based projects in Zambia listed in the China Aid Database.[51] Table 1 highlights 17 diverse Chinese health projects across African nations since 2000.

Given the changing reasons, strategies, and forums underlying vast increases in Chinese health assistance to African nations, it is necessary to understand the frameworks structuring this evolving global health diplomacy through comparative research.

FRAMEWORKS STRUCTURING CHINESE INVOLVEMENT IN AFRICAN HEALTH SYSTEMS: LESSONS FROM U.S. GLOBAL HEALTH DIPLOMACY IN AFRICA

The three frameworks structuring Chinese health diplomacy in Africa echo to various degrees the frameworks that have long structured U.S. health diplomacy in Africa, and these parallel motivations, initiatives, and approaches create an imperative for comparative global health diplomacy research. The U.S. first launched its bilateral health efforts in Africa in Liberia in 1944,[85] and within two years, Liberia had eradicated smallpox in the country and brought malaria under control in the capital. Since then, there has been a massive expansion of U.S. health assistance to African countries. Complemented by U.S. leadership in supporting multilateral health assistance efforts, aid to Africa has more than quadrupled over the past decade, with sub-Saharan Africa receiving over a quarter of all U.S. bilateral foreign assistance.[86] With both similarities and differences in comparison to the Chinese experience, the evolution of U.S. global health diplomacy offers lessons for conceptualizing analogous Chinese diplomacy efforts today.

Table 1: Examples of Chinese involvement in specific African countries since 2000 along with outcomes of Chinese involvement. Country views of China are based on Afrobarometer surveys conducted between 2014-2015. Afrobarometer is a pan-African, non-partisan research network that conducts public attitude surveys in over 30 countries in Africa.[52]

African Country	China's Involvement in Global Health Diplomacy in Africa	Time Period	Outcomes from Chinese Global Health Diplomacy
Algeria	Chinese medical teams (CMTs)	1963-present	By 2011, CMTs had operated in 21 Algerian provinces and cities and provided care in ten medical specialties.[53] From 1963-2013, 23 CMTs were dispatched from Hubei province to Algeria; 86 CMT members operated in Algeria in 2013.[54] CMTs are required by the Chinese Ministry of Health to use Cotecxin (a Chinese anti-malarial drug developed by Holley-Cotec), helping the Chinese pharmaceutical company enter the local drug market.[54] No data is available on Algerian views of CMTs. 33% of Algerians think China's economic and political influence in Algeria is positive; 35% think it is negative. 32% think China's economic assistance does a good job meeting Algeria's development needs; 31% think it does a bad job.[52]
Angola	A portion of a one billion USD line of credit from China was disbursed on several health-related projects.[55]	2003-2010	The money was used for various health projects including 86 ambulances, six provincial health centers, and rehabilitation of seven regional hospitals.[55] The line of credit was backed by oil, meaning China received oil in exchange for funding these health projects.[55]

Democratic Republic of Congo	China Railway Engineering Corporation and Sinohydro signed an agreement with the DRC for a 3 billion USD development package which included the construction of 145 health centers and 31 hospitals. The deal involved DRC repayments out of a joint Chinese-Congolese copper-cobalt mine venture.[56]	Agreement signed in 2007	It is unclear what came of the hospitals and health centers. As of 2015, the mining project faced numerous barriers including inadequate power supply and the DRC's unstable political and economic climate. The PRC reportedly halted disbursements temporarily given concerns over the investment.[57]
Cote d'Ivoire	Yunnan Kunming Pharmaceutical Company donated 75,000 USD worth of anti-malaria drugs to Côte d'Ivoire.[54]	2007	Donations of Chinese drugs to African hospitals are a cheap way to introduce Chinese products to African markets.[39] No data is available on Ivorian views of this project. 77% of Ivorians think China's economic and political influence in Cote d'Ivoire is positive; 8% think it is negative. 81% think China's economic assistance does a good job meeting Cote d'Ivoire's development needs; 6% think it does a bad job.[52]
Comoros	A team of researchers from Guangzhou University led a study involving the mass administration of 500,000 USD of antimalarials donated by the Chinese Ministry of Commerce in attempts to eradicate malaria in Comoros by 2016.[58, 59]	2007-2014	Led to significant reduction in morbidity and mortality from malaria in Comoros from 2010-2014.[60, 61] In conjunction with other aid projects, this may help China gain support from a country situated on a strategic shipping route in a region with recently-identified oil and gas reserves. Comoros is also considered to be an ideal listening post for monitoring communications across the Indian ocean. Chinese fishermen fish in Comoroan waters.[62]

Tanzania	Chinese government established a 500,000 USD antimalarial center at Leah Amana hospital in Dar es Salaam.[63, 64]	2009	Reportedly sophisticated diagnostic machines are going unused due to inadequate training for local staff, and many other medications and supplies have not been used because the labels are all in Chinese.[64] No data is available on Tanzanian views of this project. 71% of Tanzanians think China's economic and political influence in Tanzania is positive; 8% think it is negative. 52% think China's economic assistance does a good job meeting Tanzania's development needs; 18% think it does a bad job.[52]
Togo	The Chinese government constructed the Lomé Commune Regional hospital for over 13 million USD. China provides over 80,000 USD of medications and supplies to the hospital yearly.[65]	Completed 2010	100 bed hospital providing affordable patient care.[65] As in Cote d'Ivoire, donations of Chinese drugs and supplies to hospitals in Togo helps introduce Chinese products to local markets.[39] No data is available on Togolese views of this project. 72% of Togolese think China's economic and political influence in Togo is positive; 9% think it is negative. 71% think China's economic assistance does a good job meeting Togo's development needs; 12% think it does a bad job.[52]
Ghana	At the 2009 Forum on China-Africa Cooperation conference, Premier Wen Jiabao pledged that China would provide medical equipment and anti-malarial materials worth 29 million USD to the hospitals and anti-malarial centers built by China. In 2010, China built the first of these hospitals in Ghana.[29]	2010	The hospital provided treatment for malaria and other diseases. Chinese corporations also benefited from construction of the hospital. China credited aid funds for the hospital directly to the Beijing Institute of Architecture Design and the China Geo-Engineering Corporation.[29]

Zimbabwe	At the 2006 Forum on China-Africa Co-operation in Beijing, China announced plans to build the China-Zimbabwe Friendship Hospital in Mahusekwa.[66, 67]	Constructed 2010-2012	129 bed hospital offering emergency care, outpatient clinics, and inpatient wards. China also equipped the hospital with medications and supplies.[66, 67] No data is available on Zimbabwean views of this project. 48% of Zimbabweans think China's economic and political influence in Zimbabwe is positive; 31% think it is negative. 46% think China's economic assistance does a good job meeting Zimbabwe's development needs; 30% think it does a bad job.[52]
Multiple African countries	In 2010, China's "Peace Ark" hospital ship made its first trip to Africa and provided medical services for local African residents, as well as for Chinese military personnel. On its maiden voyage, it made stops to Djibouti, Kenya, Tanzania, and the Sychelles.[68]	2010-present	The ship has 8 operating theaters that can perform up to 40 major surgeries a day. It has 20 intensive care unit beds and 300 regular hospital beds. It also has extensive diagnostic and examination facilities, including a gynecological examination room. *Peace Ark* staff also hold academic exchanges with medical staff from other countries and train foreign medical staff.[69] The hospital ship is very popular to those in recipient countries. For instance, the arrival of the Chinese *Peace Ark* in the Kenyan port of Mombasa in 2010 was greeted by an enthusiastic crowd of hundreds of Kenyans and Chinese expatriates.[70] Although China may seek to gain increased commerce with countries visited by the *Peace Ark*, there is little evidence to support that *Peace Ark* missions favorably impacted Chinese economic interests.[70]

			The Peace Ark also extends the reach of the Chinese navy.[71]
South Sudan	China pledged 33 million USD to modernize Juba Teaching Hospital, the main medical center in South Sudan.[72] 5 medical teams totaling 66 members were sent to Juba since 2011, including a 12 person Chinese medical team based at the Juba Teaching Hospital in 2017.[73] CMTs operate at other South Sudanese hospitals as well and in 2017 the Chinese embassy in South Sudan donated USD 60,000 to the Paloich Friendship Hospital.[74]	2011-2017	At the Juba Teaching Hospital, the CMT treated 2500 patients between February and September 2017 and helped train South Sudanese healthcare providers.[72] The Chinese embassy donation to Paloich Friendship Hospital included much-needed medicines and medical devices.[73] China is also building goodwill for influence in South Sudan's oil sector.[75]
Kenya	Chinese Ministry of Commerce sponsored a workshop on malaria control that was implemented by Chinese pharmaceutical company Beijing Holley-Cotec.[76]	2013	30 Kenyan health department professionals attended the 2 week long training course in China. Chinese malaria experts shared Chinese experience on malaria control and offered advice on malaria control in Kenya.[76] Beijing Holley-Cotec reported that such training courses are both a way to expand their overseas marketing network and work toward common development goals.[76] There is no data on Kenyan views of this project. 76% of Kenyans think China's economic and political influence in Kenya is positive; 8% think it is negative. 67% think China's economic assistance does a good job meeting Kenya's development needs; 14% think it does a bad job.[52]

Tanzania	15 million USD for the Abdulla Mzee Hospital in Pemba.[77] 9 member medical team based in Pemba and another 12 member medical team stationed at Mnazi Mmoja Hospital, the largest public hospital in Zanzibar.[78]	Deal signed 2013, construction finished 2016	Construction of 160 bed hospital, treatment of patients, training of local health care workers [77, 78]
Cote d'Ivoire	China has invested USD 10 million to modernize the General Hospital of Gagnoa, including its laboratories.[65]	2013-present	Chinese investment facilitated the modernization of this 104 bed hospital which has become the major health center in the region. China also offers training opportunities in China for hospital staff.[65]
South Africa	In 2015, China donated four "container hospitals" to South Africa. The containers are fully equipped with diagnostic instruments, registration desks, medicines, and power generators.[79]	2013-present	While not a complete solution to lack of infrastructure in poor, rural areas, "container hospitals" help provide healthcare access to poor South Africans living in rural areas far from healthcare facilities. Each container hospital has rooms for general clinics, waiting patients, treatment, and a pharmacy. These portable hospitals were developed for long-term service use in areas with limited access to medical care and can be used for decades if properly maintained.[68] Rural populations are relieved that there are medical facilities within closer reach of their communities.[79]
Tanzania	A memorandum of understanding regarding schistosomiasis control programs was signed between the WHO, PRC, and Tanzanian government.[80, 81] The Chinese government offered funding and technology and the WHO will provide technical support and organizational coordination for research and projects	2014	This collaboration is a platform for Zanzibar to learn from Chinese experience with the control of schistosomiasis and leverage that experience to eliminate schistosomiasis in Zanzibar.[83] It is unclear so far what the outcome has been.

	promoting the elimination of schistosomiasis in Zanzibar.[82] It is unclear how much financial support was involved.		
Sierra Leone	Ebola relief including:[84] 123 million USD of humanitarian aid and 3 infectious disease teams (with 115 members) sent to Sierra Leone, Liberia, and Guinea. 59 member laboratory team sent to Sierra Leone to help build its lab testing program. China built a BSL-3 lab in Sierra Leone, representing the first permanent BSL-3 lab in Africa. Most efforts were bilateral, but China also gave multilateral support in the form of 6 million USD to the World Food Programme and 6 million USD through the UN Ebola Response Multi-Partner Trust Fund.	2014-2015	China contributed to containment of Ebola. China's swift mobilization demonstrated power projection abilities, for example, taking just one month to construct a cutting edge 100-bed Ebola treatment center in Sierra Leone. Chinese involvement creates a model for future multinational collaboration in public health emergencies; for example, there are reports of the U.S. Air Force providing forklifts to help China unload Chinese supplies in Liberia. During the Ebola crisis China quarantined travelers from West Africa, including athletes who were about to compete in the Nanjing Youth Olympics in 2014. Sierra Leone ultimately declined sending delegations to Nanjing over concerns that they were being stigmatized.[84] 55% of Sierra Leoneans think China’s economic and political influence in Sierra Leone is positive; 4% think it is negative. 44% think China’s economic assistance does a good job meeting Sierra Leone’s development needs; 12% think it does a bad job.

Constructivist vs. Realist Motivations

While neither normative justifications nor power politics can completely characterize Chinese and U.S. health diplomacy in Africa, analyzing the relationships from realist and constructivist frameworks helps to better understand the motivations underlying Chinese support for health in Africa. Viewed through realist frameworks, both countries use health aid as a form of soft power that not only contributes to welfare and development in the receiving countries, but also fulfills important domestic goals, including national security, economic growth, and business interests.[85] Yet, through a constructivist framework, both countries have historically provided health aid to African countries even when such aid did not return a direct benefit to the donor country.

From a realist perspective, the pursuit of power has certainly played a role in both Chinese and U.S. global health diplomacy. As World War II came to a close and the Cold War began, the U.S. continued to see the benefit of providing health aid to African countries as a means to further its foreign policy goals. During the Cold War, foreign health assistance became a central part of U.S. strategy to contain Communism in Africa.[87] It was believed that the control of disease through U.S. efforts would result in positive perceptions of the U.S., which would help promote U.S. ideals abroad and stop the spread of Communism in the region.[85, 87] Similarly, the Chinese government acknowledged that public health threats around the world undermine its own "non-traditional security,"[88] especially following the 2003 SARS crisis. In response, the Chinese government has prioritized strengthening its disease surveillance and response system,[89] the results of which can be seen in China's more robust response to the 2014 Ebola outbreak (table 1).[84] China's investment in health initiatives in Africa have strengthened economic relations,[88] opened new markets for Chinese goods,[39] and built goodwill to facilitate natural resource extraction in Africa.[88, 90] For example, China's $1 billion USD grant to Angola from 2003-2010 was partially used to purchase ambulances and build hospitals, returning benefits to China in the form of Angolan oil exports (table 1).[55] Following China's 1978 shift to facilitating mutually-beneficial commercial ventures,[20] many hospital construction projects in Africa became linked to commercial projects instead of being solely grant-based,[39] as seen when China made a $9 billion deal with the Democratic Republic of Congo in 2007 to build infrastructure, including 32 hospitals and 145 health centers, in exchange for ten million tons of copper and 400,000 tons of cobalt through a new joint Chinese-Congolese mining venture (table 1).[90] Realist motivations can also be seen in Chinese drug production and distribution, where Chinese drugs were introduced to Africa in accordance with China's "Going Out" strategy in the mid-1990s (which encouraged investment in international markets to promote Chinese economic development[20]), and extending this drug production, Chinese government banks have sought significant shares in some African drug companies[39] and investment in the local production of medicines in Africa.[91]

However, both Chinese and U.S. health diplomacy in Africa can also be viewed through a constructivist lens, as seen where China has provided health aid to Africa out of solidarity even when resources were limited.[20] China has striven to create true partnerships with African government recipients, in which Chinese and African practitioners work side-by-side on the ground to build health care capacity.[24, 31, 39] This is exemplified by the Chinese medical teams working in many African nations, such as those active in Algeria from 1963 to the present (table 1).[31, 53, 54] Chinese health assistance to Africa is often based on local needs and has no explicit strings attached, even where the health projects delivered through commercial deals have obvious benefit to China.[21,35] While critics of China's involvement in Africa claim that China's health diplomacy is motivated exclusively by economic self-interest, it is difficult to determine the extent to which this is true. While one study found a statistically significant relationship between Chinese health aid and Chinese exports to recipient countries,[51] another found that recipient countries' natural resources were not

associated with the nature of China's health assistance,[92] and yet another found no correlation between Chinese health aid to African countries and China's economic interests (like petroleum imports).[38] Additionally, a qualitative study of aid agreements from 1970-2007 found that China's official aid was not given preferentially to resource-rich countries, that grants and zero-interest loans were distributed evenly between African nations, and that concessional loans were given based upon a recipient country's ability to pay.[56]

As constructivist motivations are similarly expressed in U.S. health assistance, funding for health aid in Africa has increased throughout the beginning of the 21st century as a humanitarian response designed to address the significant morbidity and mortality associated with infectious diseases, particularly HIV, and improve the life expectancies and quality of life of African populations that lacked access to healthcare and other resources. The HIV epidemic became not only a humanitarian concern, but also part of a broader diplomatic strategy. Key to this U.S. strategy was the President's Emergency Plan for AIDS Relief (PEPFAR), launched in 2003.[93] Multiple studies suggest that PEPFAR's impact in target countries has been dramatic in achieving both humanitarian and security goals.[94] Research indicates that as morbidity and mortality were reduced by PEPFAR, so too were threats to governance, stability, security, and socioeconomic development,[94] with PEPFAR engendering improved public opinion and global goodwill toward the United States.[95, 96]

Thus, while national interests certainly play a role in health diplomacy in Africa, norms are shaping health engagement in Africa as well. This mixing of self-interest and normative justification is exemplified in China by the Peace Ark, a Chinese hospital ship commissioned in 2008 with dual motivations of extending the reach of the Chinese navy and providing humanitarian medical aid (table 1).[71]

Horizontal vs. Vertical Initiatives

China typically favors horizontal initiatives in global health while the U.S. typically favors vertical initiatives. The differences between Chinese and American initiatives in health aid to Africa are illustrated in Table 2, and there are advantages and disadvantages to each country's approach.[85]

Much like its health diplomacy of the 1960s-70s, China continues to utilize a predominantly horizontal approach in its health assistance to African nations.[36] Chinese medical teams remain a cornerstone of Chinese global health diplomacy. In total, China has sent more than 15,000 physicians to over 47 African nations, providing care to approximately 180 million patients.[97] While African host nations typically pay the Chinese medical team's expenses, China often funds the entire mission for the poorest host countries.[97] Beyond medical teams, China has built horizontal healthcare capacity through trainings for African medical providers and construction of healthcare facilities. China has hosted workshops on malaria treatment, such as a 2013 workshop on malaria control for Kenyan health officials that was conducted in China by Chinese pharmaceutical company Beijing Holley-Cotec (table 1).[76] China has also funded training for nurses and midwives in their home countries, offered health training courses in China for over 15,000 African students, and provided government scholarships for African students to earn medical degrees in China.[35, 39, 98] In building health systems, China has also supported many nations through hospital construction and supply procurement.[35, 97] Recent projects include the 2013-2016 construction of the Abdulla Mzee Hospital in Pemba, Tanzania[77] and the 2013 initiative to modernize the General Hospital of Gagnoa in Cote d'Ivoire (table 1).[65] Hospital construction is often part of larger aid packages on national infrastructure through the Forum on China-Africa Cooperation (FOCAC),[35] as seen with the 2010 construction of both the China-Zimbabwe Friendship Hospital in Zimbabwe[66] and a hospital in Ghana (table 1).[29]

While China has at times organized vertical campaigns against specific diseases—with anti-malarial programs a key component of Chinese health diplomacy in Africa,[6, 31, 99,

[100] as seen in the 2007-2014 mass administration of anti-malarials to eradicate malaria in Comoros[59] (Table 1)—U.S. health aid to Africa has primarily relied on a vertical approach. In 1966, the U.S. Centers for Disease Control and Prevention (CDC) began providing financial aid and trained medical staff to 20 West and Central African countries for the sole purpose of eradicating smallpox and controlling measles.[101] This focus on addressing individual diseases has endured as the U.S. has tackled specific infectious diseases such as HIV, malaria, tuberculosis, polio, and smallpox.[102] The U.S. continues its vertical approach to health aid in Africa through programs such as PEPFAR and larger USAID efforts. While the Obama Administration's Global Health Initiative sought to shift some funding toward horizontal health system support, the vast majority of funding continues to go toward HIV/AIDS, malaria, and tropical disease programs initiated during the Bush Administration.[86]

Table 2: U.S. vs. Chinese Health Aid to Africa[85]

	U.S. Health Aid in Africa	**Chinese Health Aid in Africa**
Approach	Vertical	Horizontal
Defining Scope	Health priorities are decided primarily by the US with limited input from local countries.	Health priorities are decided by African leaders with little input from China.
Conditions	The U.S. frequently imposes economic and political conditions on its aid, such as earmarks for abstinence and monogamy promotion.	China does not impose economic and political conditions on its aid, but African country votes against China in an international body would likely result in loss of aid.
Scope	The U.S. distributed $29.7 billion in official development aid in 2009, with $8 billion going to Africa (about 27%).	China disbursed about $3.1 billion in development aid in 2009, with Africa receiving $1.4 billion (about 46%).
Development Staff	USAID has a global staff of 8,000, of which 5,000 are host country nationals. Overseas projects employ considerable local personnel.	China's Department of Foreign Aid has about 100 staff. The economic sections of Chinese embassies will employ one or two people to manage aid projects locally (no host-country nationals appear to be employed). Although China's health construction projects employ local people, the higher-level positions are generally staffed by Chinese managers.
Reporting	The U.S. reports its development aid transparently.	China releases aggregate aid figures, but releases very little information about its annual or country-level aid.

Bilateral vs. Multilateral Approaches

Where China and the United States have a long history of bilateral health-related foreign aid and health engagement in Africa, both have recently sought opportunities to work

together through multilateral governance where there is a growing need for coordinated responses to globalized health issues, including tobacco regulation, global disease surveillance, data and specimen sharing, and, until recently, climate change.

Both countries have predominantly engaged in bilateral health assistance, often to the exclusion of multilateral health institutions that could sacrifice state authority over health diplomacy to intergovernmental or nongovernmental actors.[88] China's emphasis on bilateral engagement has led some scholars to characterize its approach to global health diplomacy as essentially "state-centric," with primacy placed on national sovereignty.[88] Like China, the U.S. has long been wary of compromising its sovereignty and autonomy through participation in multilateral organizations. The U.S. has signaled its skepticism of multilateralism by failing to ratify a number of international agreements and treaties, including the Kyoto Protocol on Climate Change, the Convention on Discrimination against Women, and the Convention on the Rights of the Child. In general, the U.S. approach to multilateralism has been to attempt to obtain the benefits of a multilateral order without accepting greater encroachments on its sovereignty.[103]

Yet both countries have come to see the advantages of multilateral health projects. China has donated over 30 million USD to The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and provided the organization pharmaceutical expertise for the provision and delivery of drugs.[104] China also partners with the Bill and Melinda Gates Foundation to jointly fund grants to improve health in developing countries.[105] Working within WHO, China played major roles in multilateral negotiations for the revised International Health Regulations (IHR) in 2005. Motivated by intense criticism over its handling of the SARS outbreak, the Chinese government saw that international public health emergencies needed to be resolved by cooperation at the regional and international levels.[106] Thereafter seeking leadership within WHO, China actively sought to assure the successful election of Margaret Chan, a Hong Kong citizen and first Chinese national elected to head a UN specialized agency, as Director-General of the WHO.[107, 108] Since that time, Chinese collaboration with the WHO has increased; for example, the PRC signed a 2014 memorandum of understanding with the WHO and Tanzanian government to facilitate research and projects promoting the elimination of schistosomiasis in Zanzibar (table 1).[82] An early supporter of WHO, the U.S. has practiced global health diplomacy through the support of several multilateral health funds and organizations, often serving as a leader (and leading donor) in multilateral organizations and initiatives. For example, the U.S. made the initial contribution to the Global Fund and remains its largest donor today.[109] The U.S. is also one of the largest donors to the Global Alliance for Vaccines and Immunization (GAVI).[110] In addition to providing funding to these organizations, the U.S. government is active on their boards and helps to guide the long-term strategies of these public-private partnerships.

Drawing lessons and working together, there are additional opportunities for U.S. and Chinese collaboration within WHO and across the global health landscape. The WHO principally conducts global health diplomacy through the annual World Health Assembly, and these Assemblies provide an opportunity for multilateral resolutions that are able to mobilize multi-national resources and have a significant global health impact (as seen in the World Health Assembly's 1988 creation of the Polio Eradication Initiative).[111] In addition to the WHO, global health diplomacy plays a major role in other international organizations, such as the United Nations, the group of seven (G7), the group of twenty (G20), and the World Bank.[112] Member states now serve two roles: to promote the health of populations in their own countries and to advance the health of the global community. To effectively collaborate in global health endeavors with China, scholars have suggested that the U.S. and other partners be mindful of the crucial role that China's domestic politics play in Chinese foreign aid, addressing the bureaucratic pressures that shape China's multilateral health-related development projects.[29]

China's "One Belt and One Road" initiative (OBOR) may create new avenues for multilateralism in Chinese health assistance to African nations. Announced by President Xi Jinping in 2013, OBOR aims to create an Afro-Eurasian platform for economic cooperation based on new infrastructures for connecting the region. China and the WHO have agreed to include health considerations in OBOR economic strategies and to use the expected increase in international connectivity in the region to improve health services and disease prevention in the 60 or more countries that will be involved.[113] Scholars have predicted that OBOR will bolster the response to regional public health crises through information sharing, facilitate the training of health care workers, and promote international cooperation in science and technology through joint research centers.[114]

BROADENING THE GLOBAL HEALTH DIPLOMACY RESEARCH AGENDA

China and the United States bring complementary strengths to global health diplomacy. The motivations for health assistance by both countries can be conceptualized under a constructivist lens or a realist lens depending on the circumstances. China implements more of a horizontal approach to health aid and places an emphasis on infrastructure and health systems, while the U.S. has taken a more vertical approach focused on the treatment of specific diseases. China is increasingly pursuing multilateral initiatives, but, like the U.S., is cautious about relinquishing its sovereignty to multilateral organizations. Both countries continue to contribute significant bilateral aid to improve global health. Global health diplomacy has the potential to address a wide range of health issues across the world; however, additional research is necessary on *why* global health diplomacy is pursued, *what* each nation is doing in the pursuit of diplomacy, and *how* each nation carries out their global health agendas. In comparing Chinese and U.S. health assistance frameworks in Africa, further research needs to be conducted into how realist and constructivist motivations shape global health aid, how vertical or horizontal initiatives are identified for global health diplomacy, and how bilateral and multilateral approaches contribute to global health solutions. Given the complicated mix of motivations, initiatives, and approaches involved in global health diplomacy, there is a need to develop a rigorous research agenda to systematically conceptualize these frameworks of global health diplomacy. As part of this agenda, research specific to global health diplomacy should include: research on the *topics* to which global health diplomacy is applied, the participating *actors*, the *processes* involved, and the *outcomes* of global health diplomacy.[115] By understanding why countries pursue health diplomacy, what vertical and horizontal strategies they use, and how they engage in this work bilaterally or multilaterally, it is possible to correlate these policy frameworks with public health outcomes.

CONCLUSION

With shifting frameworks in global health governance—driven by the recent rise of Chinese health assistance and a populist retreat in U.S. foreign engagement[7]—a better understanding of Chinese global health diplomacy in Africa could contribute to the implementation of more effective policies for health assistance. Multilateral organizations, as well as individual country donors providing bilateral aid, could benefit from lessons learned through comparative analysis in global health diplomacy. By understanding the range of motivations, initiatives, and approaches, a more comprehensive, integrated approach can be developed that will strengthen global health diplomacy to address public health harms.

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Regional Health Security: An Overview of Strengthening ASEAN's Capacities for the International Health Regulations

Gianna Gayle Herrera Amul and Tikki Pang

The revised IHR and the capacities to implement them are critical for global health security. However, there is a dearth of literature about regional initiatives that support strengthening capacities for IHR implementation. To fill this gap, this study utilises a mixed-methods approach to present an overview of the progress of ASEAN member states in developing their capacities for implementing the IHR according to: (1) country-reported data to the WHO from 2010 to 2016, and; (2) the grey literature from 2004 to 2017 on WHO and ASEAN-led initiatives to build ASEAN member states' capacities. Despite limitations, ASEAN is developing into a proactive entity with the region's disaster management and response framework offering a gateway towards a multi-sectoral approach to pandemic preparedness, one that goes beyond the health sector and towards inclusive and coordinated emergency responses. There is an increasing regional trend in initiatives towards integrating pandemic preparedness and response with disaster management and emergency response. While good progress has been made by some countries in strengthening capacities, there is still a need to narrow the substantive gaps to prevent these from becoming the 'Achilles heel' of regional preparedness and resilience in the face of future epidemics of infectious diseases.

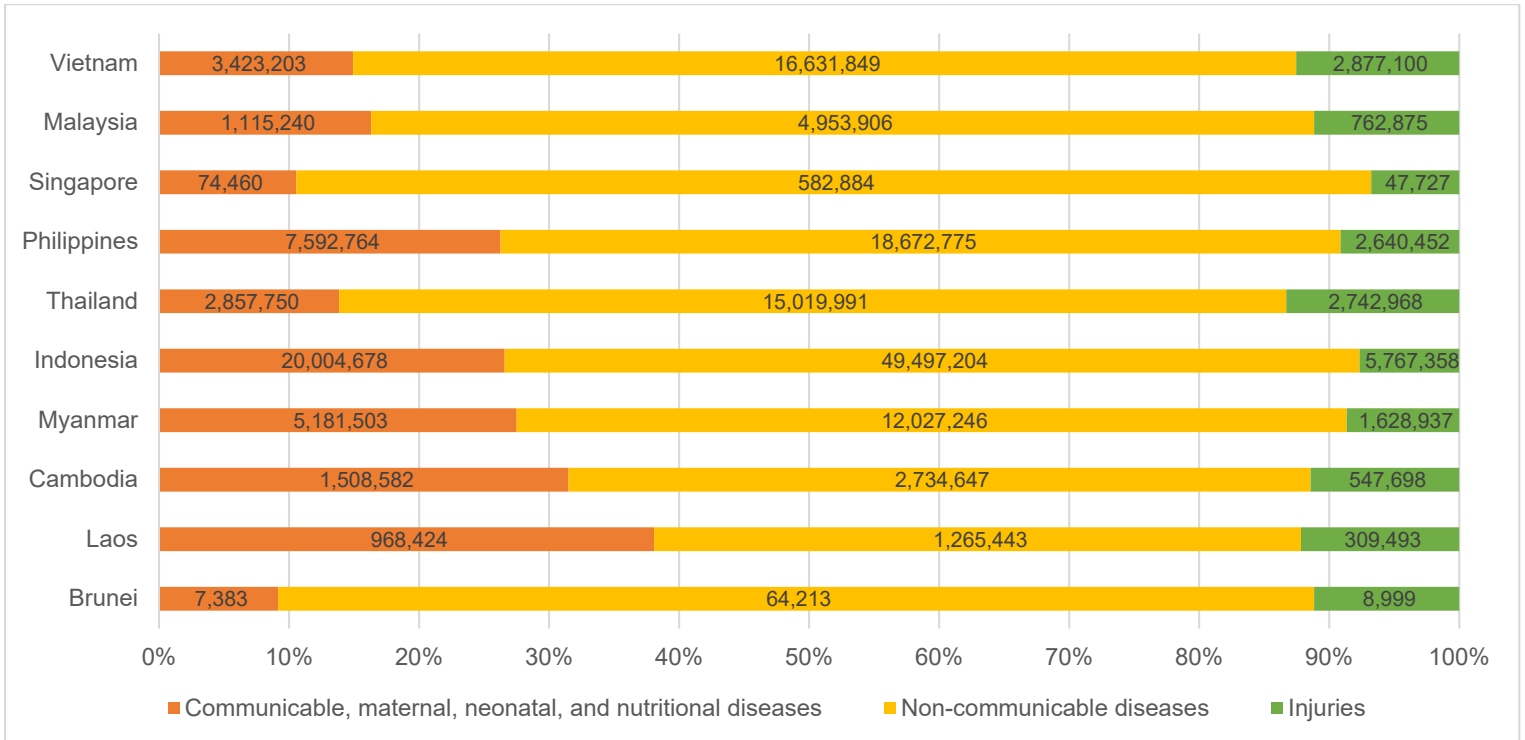
Introduction

Members of the Association of Southeast Asian Nations (ASEAN) along with the rest of the developing world, are experiencing the triple burden of non-communicable diseases, infectious diseases and injuries and accidents. This triple burden stems from a globalising and urbanising world exacerbated by challenges due to climate change, environmental pollution and natural disasters. ASEAN countries have experienced major outbreaks of infectious diseases in the past including SARS, Nipah virus, dengue, avian influenza, MERS-CoV, and, more recently, Zika. The countries of the Mekong basin also face the problem of artemisinin-resistance among malaria parasites circulating within their borders. In addition, the region has been identified as a global 'hotspot' for emerging and re-emerging pathogens.[1] The Ebola crisis in West Africa has led to calls for independent assessment of countries' capacity for public health emergencies.[2]

The aftermath of the Ebola and Zika epidemics and the inclusion of a specific target (3D) to implement the International Health Regulations (IHR) in the Sustainable Development Goals (SDGs) affirms that controlling infectious diseases and pandemic preparedness are still global priorities. There are several challenges to achieving the minimum core capacities for the IHR that are embedded in countries' health systems.

Non-communicable diseases also heavily burden ASEAN but infectious diseases are still a problem in some of its less developed members, such as Cambodia, Myanmar and Lao PDR, and even for more developed members such as the Philippines and Indonesia (See Figure 1). Infectious diseases range from about 25 to 40 per cent of the burden of disease in these countries. Consequently, Cambodia, Lao PDR and Myanmar were among the ASEAN member states that sought an extension till 2016 to fulfil their obligations to meet core capacity requirements under the IHR. Brunei Darussalam, Indonesia, Thailand and Vietnam only requested for extension from 2012 to 2014, while, Malaysia, the Philippines and Singapore have not requested for extensions since 2012. However, by 2016, not all countries that have sought extension achieved minimum core capacities to detect, report and respond to public health events.

Figure 1. Burden of disease in ASEAN, 2015, in DALYs



Source: Global Burden of Disease Study 2015. (2016). Global Burden of Disease Study 2015 (GBD 2015) Results. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), Available from http://ghdx.healthdata.org/gbd-results-tool, Permalink: http://ghdx.healthdata.org/gbd-results-tool?params=querytool-permalink/b52f5bc4506b2b578340d32aaefb285f.

Given the above, it is necessary to look into the progress of the ASEAN member states not only in strengthening their capacities for IHR implementation in the case of public health emergencies of international concern but also in envisioning health governance and health security for the region through institutionalising frameworks and initiatives.

METHODS

This study utilises a mixed-methods approach to assess the progress of ASEAN member states in developing their core capacities for the IHR. It aims to complement the country-reported data to the WHO from 2010 to 2016 as presented in Table 3, with an independent evaluation of the performance of ASEAN member states in developing their capacities for the IHR by looking at the regional initiatives implemented through the WHO and ASEAN initiatives. This involves reviewing the grey literature from 2004 to April 2017 using combinations of the following search terms: "ASEAN", "Southeast Asia", "health", "International Health Regulations" and "health security" in Google Scholar and the ASEAN and WHO websites, and when applicable, the specific IHR capacity was also included in the search terms. With the snowballing method, the literature of the results of the initial search were also consulted and included when they specifically refer to ASEAN and any of the thirteen core capacities for the International Health Regulations. The grey literature was further categorised into: (1) official documents, statements and press releases from ASEAN; (2) progress reports from the WHO and other intergovernmental organizations; (3) news reports about specific cases or outbreaks that refer to the implementation of the IHR in ASEAN member states. The list of ASEAN documents and statements included in the study are further categorised into whether their objectives are to prevent, detect, respond or related to health hazards and health emergencies at points of entry as shown in Table 2. For comparative analysis, ASEAN member states are grouped according to the state of their health systems vis-à-vis their level of human development according to the 2016 Human Development Report[3]: very high and high human development group or ASEAN1 (Singapore, Brunei Darussalam, Malaysia and Thailand) and; medium human development group or ASEAN2 (Indonesia, Vietnam, Philippines, Lao PDR, Cambodia and Myanmar). These groupings are utilised for comparing IHR capacities in Figures 3, 4, 6 and 7.

LIMITATIONS

The WHO's IHR monitoring however, is based on country-reported data and thus present issues about the reliability and validity of assessment based on a fixed-choice questionnaire template developed by the WHO that makes the IHR scores quantifiable but would lack explanatory depth. Moreover, not all countries have participated in the Joint External Evaluation which is now part of the WHO monitoring of the capacity-building for IHR implementation. As such, this study does not include results from the JEE.

RESULTS AND DISCUSSION

ASEAN: State of human development and health security

In 2016, ASEAN remains a diversely developing region, with countries in varying stages of human development. However, considerable progress has been made in narrowing the human development gaps since ASEAN embarked on building the ASEAN Community in 2009. In particular, it was only in the 2016 HDR that Myanmar moved up from the low human development group and was categorised among countries in the medium human development group. The human development index (HDI) is a composite statistic of life expectancy, education and per capita income indicators. The categorisation of ASEAN into

ASEAN6 and CMLV that categorised ASEAN member states according to their level of economic development will have to be reformulated to reflect this progress in human development. For the purposes of this study, adapting the HDI as the basis of categorising ASEAN member states as the starting point to discuss health security, reflects an attempt to shift the focus from a state-centric to a more globalist, human security-centred approach.

ASEAN member states have been reporting to the WHO on their progress in implementing IHR since 2010. Data from the Global Health Observatory from 2010 to 2016 as presented in Table 3 was used for analysis of the progress of IHR implementation in ASEAN member states. Although the dataset was updated for all member states, not all member states submitted scores for 2015 (Thailand) and 2016 (Brunei). The latest country-reported scores were then substituted to enable regional average comparisons across years and comparisons across countries. This data was used to present the average country-reported scores for IHR core capacities in Figure 2 and capacities for hazards at points of entry, food safety, chemical, zoonosis and radionuclear hazards in Figure 5. When the country-reported data is considered, ASEAN seems to have made vital progress in strengthening its core capacities from 2010 to 2014 as shown in Figures 3 and 4, but still have gaps to fill in the other health hazards and for public health events at points of entry as shown in Figure 6 and 7.

With regards to health systems, we adapted the typology proposed by Phua and Chew[4] which categorized these systems according to the stages of socio-economic development: (1) developed; (2) high performing; (3) newly industrialising; (4) transitional and; (5) developing. ASEAN1 countries are either developed or high performing while ASEAN2 countries are both newly industrialising and transitional economies. With this classification, Singapore today will be considered a developed economy characterised by a well-developed and stable health system with public and private healthcare components, serving an affluent but mostly ageing population, and funded by a mixed model of financing.[5] Malaysia, Brunei Darussalam and Thailand can be considered high performing economies. They are characterised by significant improvements both in health indicators and in the quality of health services, whether through public or private provision, and primarily financed by taxation and later reformed towards mixed models.[6] Indonesia, Philippines and Vietnam are considered newly industrialising economies. Most of these economies have significant improvements in over-all health indicators but are still characterised by disparities in resource utilisation, equity of access and the quality of care between the public and private sectors.[7] Characterised by less developed health systems, Laos, Cambodia and Myanmar are countries in transition from centrally planned socialist or authoritarian economies to market economies.[8] The diversity of ASEAN member states in terms of development has been the focus of implementing region-wide reforms toward the ASEAN Economic Community and narrowing the gap between member states have become the rationale for ASEAN integration.

The challenge of financing health security is evident in the region. In 2013, in 8 out of the 10 ASEAN member states, about 20 to 50 per cent of the total expenditure on health came from government budgets, loans and grants from international organisations and donor agencies to government agencies and from social (compulsory) health insurance funds (See Table 1). Only Thailand and Brunei spend more than 80 per cent of their total expenditure on health from public financing. The rest of the region, particularly Cambodia and Myanmar, are reliant on private health financing, which accounts for more than 70 per cent of their total health expenditures.

In practice, the WHO conception of global health security still hinges on the prevention and control of infectious diseases domestically and globally, as embodied in the 2005 IHR. The focus of the IHR revision in 2005 is further reflected in the financing of programmes and initiatives focused on emerging infectious diseases such as the WHO's

Asia Pacific Strategy for Emerging Diseases (APSED). In principle however, the IHR is not solely about disease surveillance and reporting but more so, in strengthening health systems. The rationale for strengthening a state's core capacities for surveillance, reporting, notification, verification, response and collaboration is hinged on the assumptions that a health system matures from being reactive to proactive and that inputs to a health system's components: institutional capacity, stewardship, leadership, appropriate structures and facilities, resources (human, material and financial), effective systems and functional processes, would play a role in the development of a state's IHR core capacities.9 To its proponents, the development of the IHR to its current form can be considered one of the milestones of global health security (albeit in its limited framework), health diplomacy and global health governance more broadly.

The UN's original conception of health security as the vital core of human security is based on principles of universality, interdependence, prevention and a people-centred approach.[10],[11] In theory, there are two major frameworks to health security: the state-centric or statist and the globalist approaches. On one hand, the more prominent state-centric approach is focused on the threat of emerging infectious diseases to states, oriented towards preparedness, surveillance and early warning.[12] This rather narrow framework limits the fundamental human security principles of health security. On the other hand, the fundamental tenet of a globalist approach to health security is the reference to the threat of increasing vulnerabilities to individuals and communities, not states.[13] An individual's health security is threatened not only by communicable and non-communicable diseases, but also health issues induced by poverty, violence and crises that threaten survival, dignity and livelihoods.[14] This globalist approach to health security also resonates in 'humanitarian biomedicine,' which is focused on alleviating the suffering of individuals from diseases by providing access to health care 'regardless of national boundaries or social groupings' in poorer countries that lack or have weak public health infrastructure.[15]

In Southeast Asia, health security has been incorporated as a non-traditional security concern – transboundary, multi-sectoral issues – that need to be managed but are beyond the ambit of states and, therefore, requiring cooperation and collaboration among different stakeholders, both public and private. Health security has in a way complemented the Asian view of "comprehensive security" – a multidimensional and holistic framework of security that is focused on socio-economic, political and environmental insecurities and threats that affects individuals and
communities. Globally, health security has been used as the overarching framework for international collaborations such as the US-led Global Health Security Agenda (GHSA) to improve health systems worldwide. Indonesia, the largest ASEAN member state in terms of population, serves in the Steering Group of the GHSA while Malaysia, Singapore, Thailand, and Vietnam are member countries. The concept of health security also helped shape the development of regional health governance in ASEAN. From the ASEAN Socio-Cultural Community Blueprint[16], regional health security issues were further operationalised in the ASEAN Strategic Framework on Heath Development including, but not limited to food safety, access to healthcare and promotion of healthy lifestyles, communicable disease control, a vision of a drug-free ASEAN and disaster-resilient nations and safer communities.

Although limited, health security has been cited in a number of cooperation frameworks with ASEAN's dialogue and intergovernmental organisation partners. It became embedded in the diplomatic vocabulary of health ministers not only within ASEAN but also with its dialogue partners– China, Japan, South Korea, the US and Canada – particularly in the aftermath of SARS from 2003 to 2005. Furthermore, the ASEAN Secretariat[17] cited health security – along with food security and poverty alleviation – as the rationale for the joint ASEAN-ADB project on highly pathogenic avian influenza (HPAI) in ASEAN that involved strengthening regional coordination.

Table 1. Selected health system indicators in ASEAN member states

ASEAN Member State	Public health expenditure as % total expenditure on health (2013)	Private health expenditure as % total expenditure on health (2013)	Out of pocket expenditure as % total private expenditure (2013) (2.a)	Number of physicians (2.c)	Number of nurses and midwives (2.c)	Physician density (per 10000 population) (2.d)	Nurses and midwives density (per 10000 population) (2.d)	Hospital beds (per 1000 population) (1.b)
Singapore	39.8	60.2	94.3	11733	37618	21	69	2
Brunei Darussalam	91.9	8.1	97.8	596	3323	14.43	80.48	2.8
Malaysia	54.8	45.2	79.9	32979	90199	11.98	32.76	1.9
Thailand	80.1	19.9	56.7	26244	138710	3.93	20.77	2.1
Indonesia	39	61	75.1	49853	338501	2.04	13.83	0.9
Philippines	31.6	68.4	82.9	93862	488434	11.53	60	1
Vietnam	41.9	58.1	85	107867	112029	11.9	12.36	2
Lao PDR	49.3	50.7	78.8	1160	5581	1.82	8.76	1.5
Cambodia	20.5	79.5	75.1	2440	11454	1.69	7.91	0.7
Myanmar	27.2	72.8	93.7	29832	48871	6.12	10.03	0.6

[1] World Bank, World Development Indicators.
[a] GNI per capita, PPP, current international $, http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD (accessed 25 January 2016).
All data for 2014 except for Brunei Darussalam (2012).
[b] Hospital beds (per 1,000 people), http://data.worldbank.org/indicator/SH.MED.BEDS.ZS (accessed 25 January 2016).
Data for Myanmar (2006), Thailand, Vietnam (2010), Singapore, Philippines, Cambodia (2011), Brunei Darussalam, Malaysia, Indonesia, Laos (2012).
[2] World Health Organization, Global Health Observatory.
[a] Health expenditure ratios, http://apps.who.int/gho/data/node.main.75?lang=en (accessed 25 January 2016)
[b] Health expenditure per capita, http://apps.who.int/gho/data/node.main.78?lang=en (accessed 25 January 2016)
[c] Health workforce, absolute numbers, http://apps.who.int/gho/data/node.main.A1443?lang=en (accessed 25 January 2016)
Data for Vietnam (2013), Brunei Darussalam, Indonesia, Laos, Cambodia, Myanmar (2012), Malaysia, Thailand (2010), Philippines (2004)
Data for Singapore (2014). Ministry of Health, Singapore. Singapore Health Facts, Health Manpower. https://www.moh.gov.sg/content/moh_web/home/statistics/Health_Facts_Singapore/Health_Manpower.html
[d] Health workforce, density per 1000, http://apps.who.int/gho/data/node.main.A1444?lang=en (accessed 25 January 2016)
Data for Vietnam (2013), Brunei Darussalam, Indonesia, Laos, Cambodia, Myanmar (2012), Malaysia, Thailand (2010), Philippines (2004)
Data for Singapore (2014). Ministry of Health, Singapore. Singapore Health Facts, Health Manpower. https://www.moh.gov.sg/content/moh_web/home/statistics/Health_Facts_Singapore/Health_Manpower.html

Southeast Asia has two major tipping points for global health security: SARS and the H5N1 epidemics. Since the 2003 SARS episode, health security in Southeast Asia and more so, globally, has been focused on the threat of emerging infectious diseases. The ADB[18] estimated that SARS cost the region about USD18 billion in nominal GDP. The decline in expenditure resulted in almost USD60 billion overall loss in demand and business revenues. The episode prompted a re-evaluation of the IHR and led to its eventual revision in 2005 that not only expanded the list of diseases to report, but also acknowledged the inherent risks of globalisation.[19] This also led to the establishment of the APSED in 2005 and by 2010, has expanded from five to eight areas for capacity building.

This was further reinforced in the H5N1 pandemic episode when Indonesia refused to share virus samples of H5N1. The event put the spotlight on infectious diseases with pandemic potential such as avian influenza and also brought to fore the value of health diplomacy to push not only for global health security but also global health equity.[20] This eventually led to the 2011 Pandemic Influenza Preparedness Framework that aims to ensure the increased access of developing countries to vaccines and other pandemic related supplies.[21] Current concerns with the fifth epidemic wave of the pathogenic, more recent H7N9 strain of influenza in China, which has infected more than a thousand people since 2013[22], underscore the importance of preparedness among ASEAN member states. These tipping points led to a slew of capacity building programmes, frameworks and initiatives for global health security in ASEAN.

Regional Frameworks and Initiatives: Response, detection, capacity building, animal health and role of military

Southeast Asia has become a 'hotspot' of emerging infectious diseases because of major outbreaks in the region, and the unprecedented connection through movements of people, animals and products as well as rapid urbanisation that produce not only global cities but also disease "hubs."[23,24,25] The emergence and re-emergence of infectious diseases such as MERS-CoV, multi-drug resistant tuberculosis, drug-resistant malaria, Ebola and Zika highlighted for regional policymakers that strengthening health systems is key to pandemic preparedness.

The post-2015 ASEAN health agenda echoes most of the health priorities in the previous ASCC Blueprint. ASEAN identified four clusters under "A Healthy, Caring, and Sustainable ASEAN Community" namely: (1) promoting healthy lifestyle; b) responding to all hazards and emerging threats; c) strengthening health system and access to care; and d) ensuring food safety.[26]

A look into initiatives post-SARS that were either WHO-led or were ASEAN-centric shows that ASEAN has been taking steps towards building the IHR capacities of member states (See Table 2). From Table 2, five core observations about regional capacity building for IHR can be made. First, in terms of initiatives (including regional agenda, frameworks and strategies), there are more efforts concentrated towards building capacities for response. This poses a challenge since capacities for prevention and detection needs more political will and investment in health systems strengthening. Second, ASEAN-centric initiatives, particularly the ASEAN Plus Three (China, Japan and South Korea) [APT] framework, have attempted to improve regional capacities for detection, particularly with partnership laboratories and a field epidemiology training network. This reflects the trend of reliance of ASEAN member states on financial and technical support from donor countries and neighbouring high-income countries to develop its capacities – either through period grants or through specific projects. Until ASEAN member states' become more competent and sustainable, the challenge to break away from overdependence from international organizations, donor agencies and multilateral financing institutions remains.

Third, capacity building for IHR in ASEAN, particularly pandemic preparedness and response, is integrated into its disaster preparedness and emergency response framework. This is evident in the 2015 ASEAN Socio-Cultural Community Blueprint (under *Building disaster-resilient nations and safer communities*) and in the 2005 ASEAN Agreement on Disaster Management and Emergency Response (AADMER), the only legally-binding regional agreement enforced by ASEAN.[27] Fourth, there is an increasing recognition that animal health is closely connected to human health in ASEAN, particularly with initiatives related to highly pathogenic avian influenza, veterinary epidemiology and, more recently, coordination on animal health and zoonoses. Finally, the establishment of the ASEAN Centre for Military Medicine reflects a lesson learned from the Ebola epidemic in West Africa, an explicit recognition that the military has the capacity to respond to health emergencies especially where health systems are weak or absent.

From a globalist health security perspective, all these issues reflect the nuances of the securitisation and desecuritisation of health in ASEAN. In the past five years, ASEAN officials no longer cite "health security" as much as they did in the aftermath of SARS. However, the references to threats, hazards, safety, and health systems in official statements and the number of policies and programmes for communicable disease control shows the priority given to infectious diseases in the region.[28] The ASCC 2025 Blueprint specifies the goal of resilience for the region through "a safer ASEAN that is able to respond to all health-related hazards including biological, chemical, and radiological-nuclear and emerging threats" as a strategic measure.[29]

Aside from the WHO and a host of UN entities, some ASEAN member states also participate in global health initiatives that are focused on IHR implementation. For example, Indonesia, Malaysia, Singapore, Thailand and Vietnam are involved in the GHSA, a partnership of about 50 countries, international organizations and non-governmental organizations. This partnership – an initiative under US President Barack Obama's administration, is based on the vision that global health security is a shared responsibility. Among those involved in the region, only Vietnam and Cambodia have developed a road map that outlines its needs and priorities to implement the IHR successfully, while Indonesia is part of the GHSA Steering Group. The GHSA launched external country assessments to promote transparent and objective assessment processes for GHSA implementation. Since 2016, the external assessments has since been developed and integrated to be part of the WHO's monitoring and evaluation framework for the IHR as the Joint External Evaluation Tool.[3]

ASEAN's Core Capacities from 2010 to 2016

Based on the regional average attribute scores on the core capacities derived from the country reports as shown in Figure 2, there was significant progress in ASEAN's capacities for human resources and preparedness with about 38 per cent and 31 per cent increase from 2010 to 2016, respectively. The region's capacities for risk communication increased by 30 per cent, legislation by 29 per cent, surveillance by 26 per cent., from 2010 to 2016. These results correspond with the considerable progress in the Asia Pacific region that the APSED evaluation noted in two areas: (1) surveillance with the establishment of event-based surveillance; (2) human resources with the establishment of national Field Epidemiology Training Programmes (FETPs) and training field epidemiologists.[31]

Table 2. Frameworks and Initiatives for IHR in ASEAN from 2004 to April 2017

IHR Core Capacities	• Components	• WHO-led	• ASEAN-based
Prevent	• national legislation, policy and financing • IHR coordination, communication and advocacy • antimicrobial resistance (AMR) • zoonotic disease • food safety • biosafety and security • immunization	• Asia Pacific Strategy on Emerging Diseases (2005-2015) • Regional Strategy for Food Safety (Western Pacific 2011-2015; Southeast Asia 2013-2017) • Regional Strategy on prevention and containment of AMR (Southeast Asia 2010-2015) • Action Agenda for AMR (Western Pacific 2015)	• ASEAN Plus Three Emerging Infectious Diseases Programme (2004-2008) • ASEAN Cooperation on Animal Health (2006) • ASEAN Plus Three Universal Health Coverage Network • ASEAN Food Safety Regulatory Framework • ASEAN Risk Assessment Centre for Food Safety (2016) • ASEAN Regional Animal Health Information System (2011) • ASEAN Coordinating Centre for Animal Health and Zoonoses (2016) • ASEAN Rabies Elimination Strategy (2014-2023) • Protocol on Communication and Information Sharing on Emerging Infectious Diseases in the ASEAN Plus Three Countries (2007) • ASEAN Health Cluster 3: Strengthening Health Systems and Access to Care • ASEAN Health Cluster 4: Ensuring Food Safety • ASEAN Dengue Day (since 2011)
Detect	• national laboratory system • real-time surveillance • reporting • workforce development	• Asia Pacific Strategy for Strengthening Health Laboratory Services (2010-2015) • Mekong Basin Disease Surveillance (2001)	• ASEAN Plus Three Partnership Laboratories (2009) • ASEAN Plus Three Field Epidemiology Training Network (2011) • ASEAN Regional Strategy for Veterinary Epidemiology Capacity Development and Networking (2013)

Respond	• preparedness • emergency response operations • linking public health and security authorities • medical countermeasures and personnel deployment • risk communication	• Southeast Asia Region Benchmarks for Emergency Preparedness and Response Framework • Western Pacific Framework for Disaster Management for Health	• ASEAN Agreement on Disaster Management and Emergency Response (AADMER) • ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) (2011) • Regional Framework for Control and Eradication of Highly Pathogenic Avian Influenza (HPAI) (2006-2008) • ASEAN Regional Strategy for Progressive Eradication of HPAI (2008-2010) • ASEAN Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Operations (SASOP)(2009) • Disaster Safety of Health Facilities in the AADMER Work Programme (2010-2015) • ASEAN Minimum Standards on Joint Multisectoral Outbreak Investigation and Response (2010) • ASEAN Risk Communication Resource Centre (2012) • ASEAN Emergency Operations Centre Network (2016) • ASEAN Centre for Military Medicine (2016)
Hazards and Health Emergencies at Points of Entry	• points of entry • chemical events • radiation emergencies	• Regional Strategy for Chemical and Radiological Safety (2013)	• ASEAN Health Cluster 2: Responding to all Hazards and Threats • ASEAN Plus Three Initiative for Healthy Tourism and Travel (2008-2009) • Healthy Tourism Strategic Framework and Work Plan

On the other hand, ASEAN's weaknesses lie mainly in its coordination capacity with only a 15 per cent increase, in its laboratory capacity with only a 13 per cent increase and in its response capacity with only a 4 per cent increase from 2010 to 2016. In terms of the scale of capability level (0 to 100), ASEAN's core capacities on average, ranged from 90 to 96 in 2016 (See Table 3), from a range of 58 to 88 in 2010. However, this data contradicts with the APSED evaluation which cited considerable progress in: (1) response – with improvements in the effectiveness of rapid response teams and; (2) laboratory – with improvements in the effectiveness of public health laboratory capacity for basic diagnosis.[32] Such a contradiction can be attributed to the fact that the APSED evaluation integrated the programme's achievements into the assessment, while the self-reporting mechanism of the IHR on which the regional average for each core capacity was derived from is limited to the assessment of the respective country's health authorities of their own capacity. The APSED evaluation also incorporates other countries that do not belong to ASEAN, but are members of the Western Pacific and Southeast Asia regions of the WHO.

Table 3. Country-Reported IHR Capacities in ASEAN, 2010 and 2016

	Country	Year	Core Capacities								Points of entry	Hazards			
			Legislation	Coordination	Surveillance	Response	Preparedness	Risk communication	Human resources	Laboratory		Zoonosis	Food safety	Chemical	Radionuclear
ASEAN1 (very high and high human development)	Singapore	2010	100	100	100	100	100	100	100	100	100	76	100	100	86
		2016	100	100	100	100	100	100	100	100	100	100	100	100	92

	Brunei Darussalam	2010	0	66	61	90	39	70	16	65	61	84	93	14	6
		2016	100	100	100	100	100	100	100	100	88	100	100	46	54
	Malaysia	2010	100	100	64	100	100	70	100	77	75	100	100	100	100
		2016	100	100	100	100	100	100	100	100	100	100	100	100	100
	Thailand	2010	50	100	52	94	73	50	66	83	65	61	93	57	6
		2016	100	90	85	100	100	100	100	100	97	100	100	100	100
ASEAN2 (medium human development)	Indonesia	2010	100	100	56	89	71	80	83	100	39	84	100	85	86
		2016	100	100	100	100	100	100	100	100	100	100	100	92	92
	Viet Nam	2010	50	71	51	100	35	70	66	94	66	76	100	71	100
		2016	100	100	100	94	100	100	100	100	100	100	100	92	100
	Philippines	2010	0	48	88	58	66	90	33	80	89	76	33	21	20
		2016	100	90	95	100	90	100	100	100	30	89	80	77	77
	Lao PDR	2010	75	75	64	94	73	20	66	61	3	84	46	0	0
		2016	100	67	90	88	100	86	100	86	26	89	80	54	15
	Cambodia	2010	100	58	84	58	0	30	16	76	40	69	53	14	0
		2016	50	90	85	47	20	71	40	68	18	89	87	23	23
	Myanmar	2010	100	66	88	100	66	90	33	70	52	76	100	71	33
		2016	100	90	100	94	90	100	100	70	97	100	100	38	8

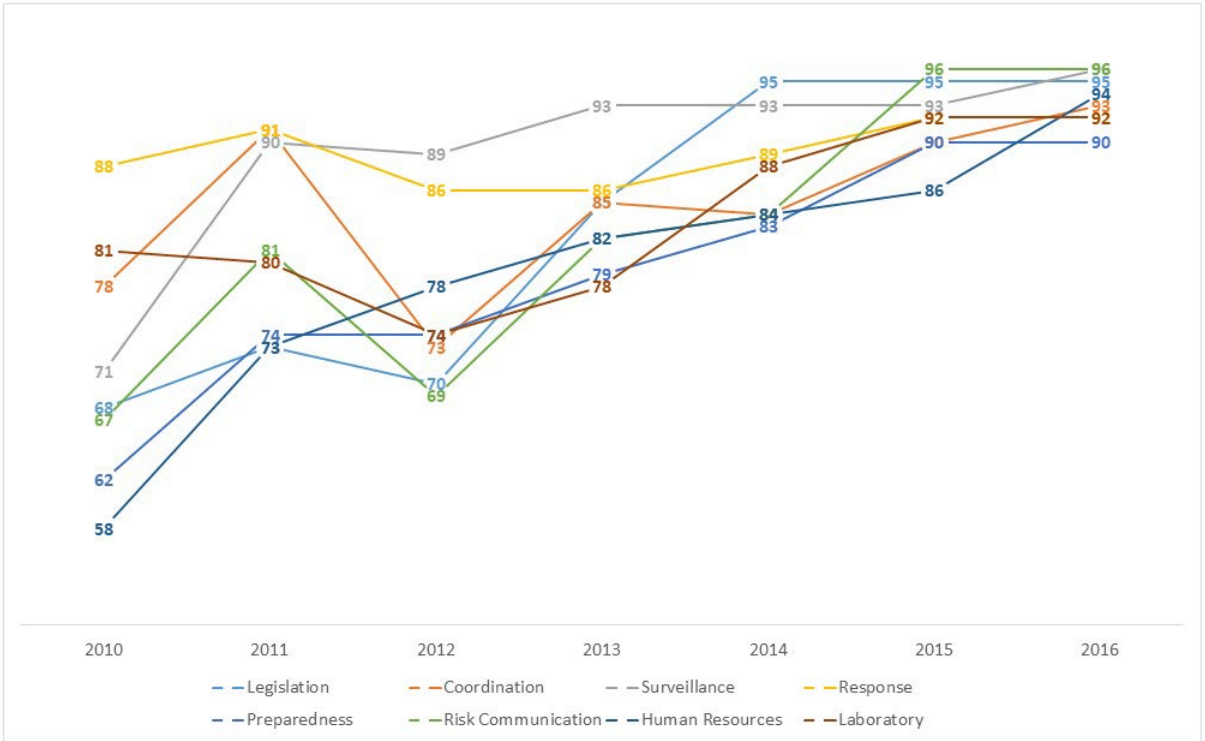
	ASEAN1 Average	*2010*	*63*	*92*	*69*	*96*	*78*	*73*	*71*	*81*	*75*	*80*	*97*	*68*	*50*
		2016	*100*	*98*	*96*	*100*	*100*	*100*	*100*	*100*	*96*	*100*	*100*	*87*	*87*
	ASEAN2 Average	*2010*	*71*	*70*	*72*	*83*	*52*	*63*	*50*	*80*	*48*	*78*	*72*	*44*	*40*
		2016	*92*	*90*	*95*	*87*	*83*	*93*	*90*	*87*	*62*	*95*	*91*	*63*	*53*
	Regional Average	*2010*	*68*	*78*	*71*	*88*	*62*	*67*	*58*	*81*	*59*	*79*	*82*	*53*	*44*
		2016	*95*	*93*	*96*	*92*	*90*	*96*	*94*	*92*	*76*	*97*	*95*	*72*	*66*

Source: WHO, Global Health Observatory

Narrowing Gaps in Core Capacities between ASEAN1 and ASEAN2

When the progress between the two groups in ASEAN are compared, the results in progress vary from the regional average. In 2010, there were narrow gaps between ASEAN1 and ASEAN2 countries, particularly in terms of six core capacities in legislation, coordination, response, preparedness, risk communications and human resources (See Figure 3). By 2016, progress in further narrowing the gaps can be observed on all core capacities among the ASEAN member states as shown in Figure 4. This narrowing gap was evident in almost all core capacities, except for surveillance, where the two groups almost converge. The perceived strength in surveillance especially among ASEAN2 countries is rooted in the achievements of the Mekong Basin Disease Surveillance (MBDS) Network which includes all mainland ASEAN countries (Cambodia, Lao PDR, Myanmar, Thailand and Vietnam) and China (Yunnan and Guangxi).[33] Along with convergence in surveillance capacities (as shown in Figure 4), there is a narrowing gap in capacities for legislation, coordination, risk communication with less than 10 per cent difference between the groups. However, there are still wide gaps in response, preparedness, human resources and laboratory with differences between the two groups ranging from 10 to 17 percent. In most ASEAN2 countries, human resources for health, a key building block of health systems, are still insufficient, with the health workforce concentrated in urban centres, and most physicians engaged in dual practice or maintaining clinical practice in both public and private sector.[34] There is an evident disparity in the health workforce between ASEAN1 and ASEAN2 countries. Singapore and Brunei, the smallest states in the region in terms of population, have more doctors, nurses and midwives per 1000 population than the rest of the region (See Table 1). However, the Philippines with an overt policy of exporting its skilled health workforce, remains an exception in the region, with the majority of its trained health workforce practicing abroad, and not just within the region but globally These gaps point to the need to assess the achievements of the ASEAN Plus Three Field Epidemiology Training Network (2011) in developing the member states' human resources and to evaluate the ASEAN Plus Three's Partnership Laboratories (2009) progress in strengthening laboratory capacities (See Table 2).

Figure 2. ASEAN'S IHR Core Capacities' Progress from 2010 to 2016



Source: WHO, Global Health Observatory

The two group's gap for coordination and risk communication from 2010 to 2016 increasingly narrowed from 24 per cent to 8 per cent, and from 14 per cent to 7 per cent, respectively as shown in Figures 3 and 4. However, coordination issues *within* countries still present a broader health security problem in managing cross-border public health emergencies, especially with the archipelagic nature of the highly populated countries in the region – Indonesia and the Philippines. Among ASEAN1 countries, Malaysia and Thailand both serve as host countries for regional response mechanisms. Malaysia hosts the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre), which houses the Disaster Emergency Logistic System for ASEAN (DELSA) and the ASEAN Emergency Operations Centre (EOC). Thailand, on the other hand, hosts the ASEAN Plus Three Emerging Infectious Disease Programme which houses the ASEAN Plus Three Field Epidemiology Training Network, and maintains a regional stockpile of essential medical supplies and protective equipment for the WHO Southeast Asia region. Thailand also laid out a National Vaccine Policy and Strategy (2016-2021) which includes building a vaccine factory and maintaining vaccine reserves for future epidemics and for regional humanitarian operations.[35]

Among ASEAN2 countries, the Philippines and Vietnam had the most progress from 2010 to 2014 in terms of its core capacities, except for risk communication and response, respectively (See Table 3). Vietnam, with USAID support through the GHSA, has laid out its Global Health Security Roadmap and among the ASEAN2 countries, has been consistent in the application of the One Health approach in the aftermath of SARS, and has since been able to prevent and control avian influenza, pandemic influenza, rabies and other zoonotic diseases within its borders.[36] By 2016, Indonesia had achieved 100 per cent progress in its weaknesses in 2010, particularly surveillance, response, preparedness, risk communication and human resources (See Table 3). This can be partly attributed to Indonesia's membership in in the Steering Group for the GHSA.

Among the transitioning countries in ASEAN2, Myanmar and Lao PDR had substantive progress and Cambodia had the least progress in most core capacities (see Table 3). Myanmar, despite being the only country in ASEAN that only recently moved from the low human development to medium human development category, reported progress in most capacities except for laboratory capacity, where it reported no progress from 2010 to 2016. Disasters and internal conflict coupled with endemic infectious diseases (seasonal cholera in conflict-ridden areas, drug-resistant malaria and year-round dengue) amplify Myanmar's weaker core capacities.

These are real and tangible gaps that needs to be narrowed during the succeeding development phases of ASEAN Community building. These coordination gaps can be attributed to the fact that as of 2015, only Singapore, Malaysia and Thailand in ASEAN1 have reported to the ASEAN Secretariat about having developed pandemic preparedness and response (PPR) sectoral plans, conducted multi-sectoral simulation exercises for PPR and developed guidelines and policies on PPR.[37] On the other hand, only Vietnam in ASEAN2 has reported on accomplishing the same.[38] The lack of reported plans to the ASEAN Secretariat however does not translate to the absence of them. In fact, all ASEAN countries have existing pandemic preparedness plans. Political nuances hamper the coordinated and integrated reporting and monitoring mechanism at the regional level on pandemic preparedness, which still needs to be integrated with global monitoring mechanisms, such as WHO's GOARN (Global Outbreak Alert and Response Network).

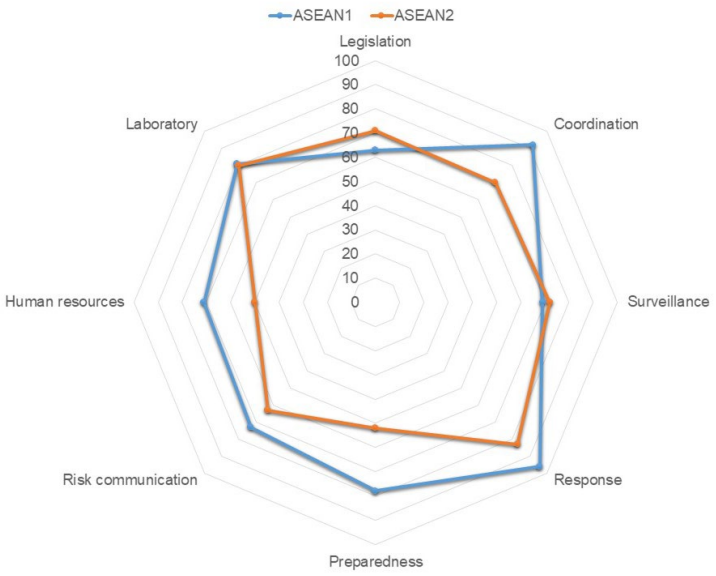
Considering the institutional developments in ASEAN, the region should be able to show progress in coordination, with the establishment of the AHA Centre in 2011. Moreover, the region has established response mechanisms, namely the ASEAN Minimum Standards on Joint Multisectoral Outbreak Investigation and Response established in 2010 and the ASEAN EOC Network established in 2016 (See Table 2). Similarly, there is a need to assess whether its capacity in risk communication has progressed particularly with the

establishment of the ASEAN Risk Communication Resource Centre in 2012 (See Table 2). Furthermore, the APT mechanism has provided a channel for information sharing in the region. Health ministers from APT countries have conducted video conferences and table top exercises for preparedness and response to emerging and re-emerging infectious diseases, including Ebola, MERS-CoV and Zika.[39] These platforms for sharing information and coordinating response, in a sense, should contribute to the strengthening and achievement of ASEAN member states' core capacities for IHR. Improvement needs to start in an evaluation of ASEAN's IHR capacity, not as disaggregate members of two WHO-defined regions (Western Pacific and Southeast Asia) but as ASEAN. Among the action lines under the 2009 ASEAN Socio-Cultural Community (ASCC) Blueprint[40] was to:

> *"...consolidate, further strengthen and develop regional cooperative arrangements through multisectoral and integrated approaches in the prevention, control, preparedness for emerging infectious diseases in line with International Health Regulations 2005 and the Asia Pacific Strategy for Emerging Diseases (APSED)."*

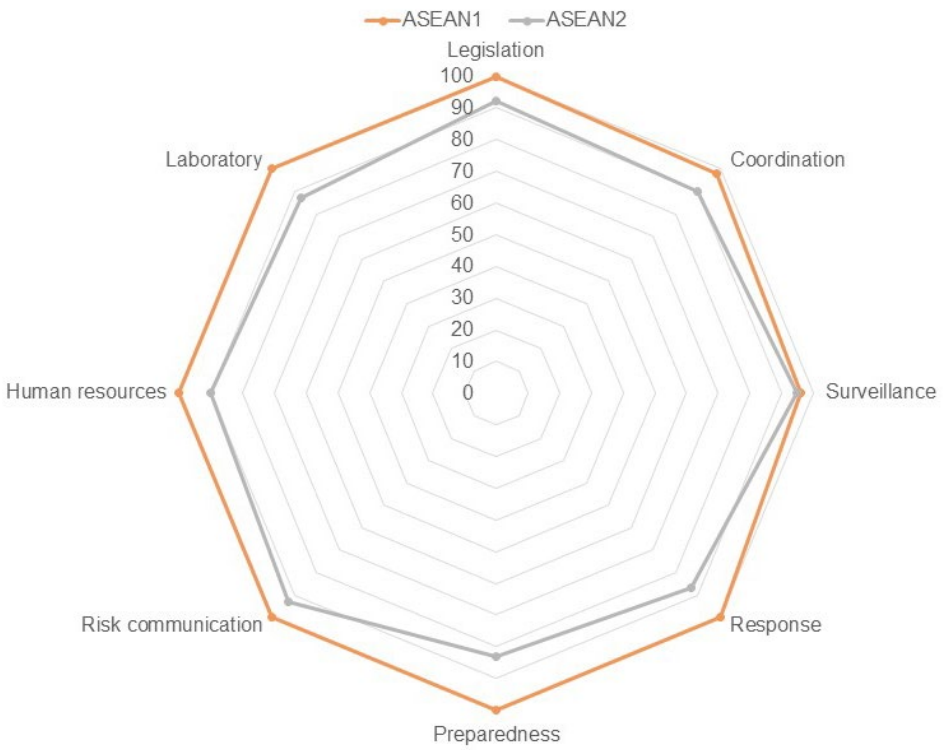
Monitoring the capacity of ASEAN and its cooperation mechanisms in terms of the IHR, particularly in surveillance and coordination not only within countries but also between member states, is thus important, not only to meet objectives under the IHR but also under the ASCC Blueprint. Achieving IHR core capacities is particularly relevant to the ASCC 2025 goals to "promote a resilient health system in response to communicable diseases, emerging infectious diseases and neglected tropical diseases" (goal 3) and "to respond to environmental health threats, hazards and disasters, and to ensure effective preparedness for disaster health management in the region, (goal 4)" under a broader cluster agenda of "responding to all hazards and emerging threats.[41]"

Figure 3. Gaps in IHR Core Capacities among ASEAN Member States, 2010



Source: WHO, Global Health Observatory

Figure 4. Gaps in IHR Core Capacities among ASEAN Member States, 2016

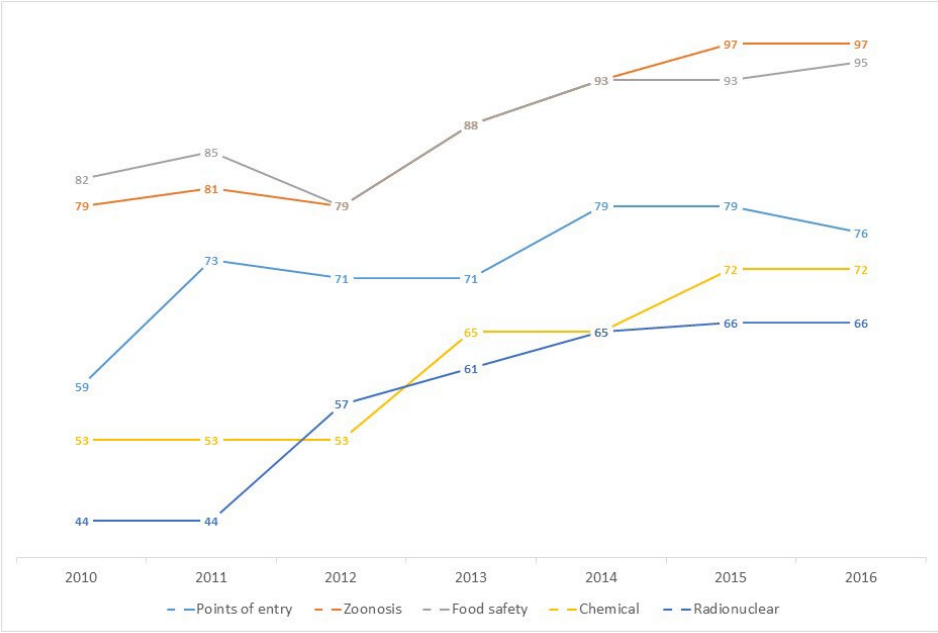


Source: WHO, Global Health Observatory, accessed May 14, 2018.

ASEAN's Capacities for Public Health Events at Points of Entry and Health Hazards

Compared to the core capacities described above, the picture for health hazards and points of entry is quite uneven in terms of member states' progress. As shown in Figure 5, the country-reported scores show that, at the regional average and in terms of capacities for health hazards and public health events at points of entry, there was significant progress in terms of regional capacity for dealing with radionuclear emergencies with a 34 per cent increase, followed by capacities for chemical emergencies with a 26 per cent increase. However, there was minor progress in ASEAN's capacities for public health events at points of entry with onlu a 22 per cent increase, and capacity for health emergencies caused by zoonosis with a 19 per cent increase. The least progress in average ASEAN capacity was for food safety with only a 14 per cent increase. In terms of the scale of capability level (0 to 100), ASEAN's capacities for health hazards (chemical, radionuclear, food safety and zoonosis) and public health events at points of entry on average, ranged from 66 to 97 in 2016 (See Table 3), from a range of 44 to 82 in 2010 (See Figure 5).

Figure 5. ASEAN's IHR Capacities for Health Hazards and Public Health Events at Points of Entry: Progress from 2010 to 2016



Source: WHO, Global Health Observatory

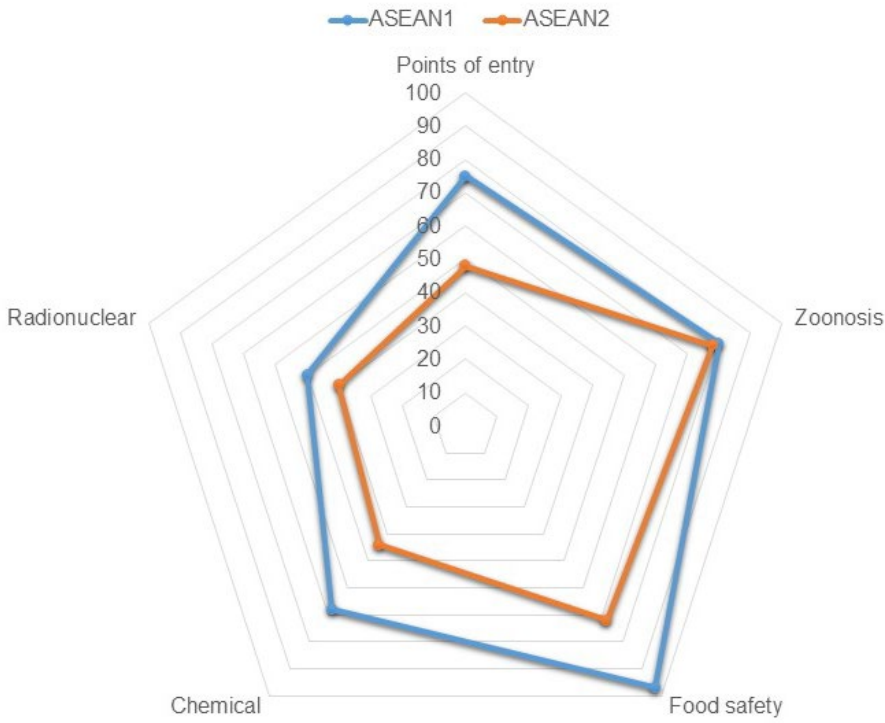
Wide Capacity Gaps in Health Hazards and Public Health Events at Points of Entry between ASEAN1 and ASEAN2

In 2010, the gaps between ASEAN1 and ASEAN2 countries are substantive in terms of public health events at points of entry, food safety and chemical hazards, while there is minimal difference in radionuclear health hazards as shown in Figure 6. Public health capacity for zoonotic health emergencies are almost at the same level for ASEAN1 and ASEAN2 countries. Comparing the achievements between these countries in 2016 (See Figure 7) shows a narrowing gap in public health capacity for zoonotic and food safety-related public health emergencies owing to regional and global initiatives that focused on One Health, a regional food safety regulation framework and recognition of the convergence of animal and human health (See Table 2). Despite progress in terms of regional average, the gap between ASEAN1 and ASEAN2 in 2016 for radionuclear and chemical capacity is at 39 per cent and 28 per cent, respectively. As shown in Figure 7, there is still a wide gap between ASEAN1 and ASEAN2 in terms of health emergency capacities at points of entry, with a 35 per cent difference, despite the increase in regional average from 2010 to 2016 (See Table 3).

Among ASEAN1 countries, Singapore and Malaysia reported achieving core capacities (score of 100) in their capacities to deal with most of the health hazards. However, Singapore and Malaysia reported zoonosis and public health emergencies at points of entry as weaknesses, respectively. Brunei and Thailand have shown substantive progress in most of the health hazards, particularly in food safety and public health emergencies at points of entry, respectively.

Among ASEAN2 countries, only Vietnam reported consistent progress on all health hazards while Indonesia, Cambodia, Lao PDR and Myanmar reported weaker progress in developing capacities for chemical hazards. Moreover, the Philippines and Lao PDR had setbacks in building their capacity to address health emergencies at points of entry while Cambodia and Lao PDR did not show any progress in terms of building capacities for radionuclear hazards. As with the core capacity for coordination, the archipelagic nature of two ASEAN member states, Indonesia and the Philippines poses inherent problems in achieving effective core capacity for public health events at points of entry.

Figure 6. Gaps in Capacities for Public Health Events at Points of Entry and Health Hazards, 2010

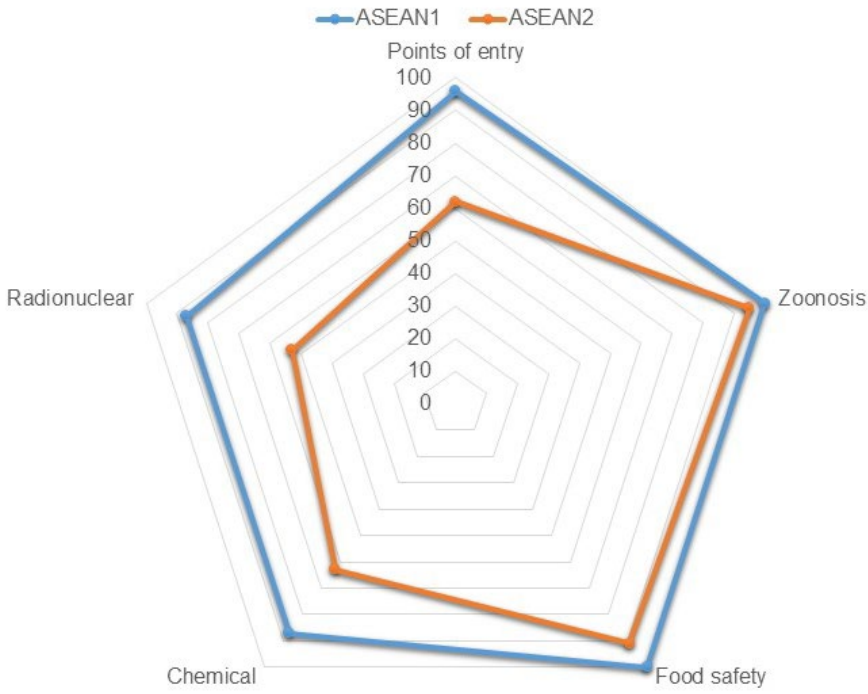


Source: WHO, Global Health Observatory

The seemingly weak capacity for radionuclear hazards can be partly attributed to the accession of ASEAN member states to the Southeast Asia Nuclear Weapon Free Zone (SEANWFZ) and the absence of operational nuclear power plants in ASEAN. Although plans for nuclear energy development have been announced by Vietnam, Malaysia and Indonesia within the last decade, most of these plans were stalled or delayed for another decade or so, after the 2011 Fukushima Daiichi nuclear disaster in Japan. This however does not justify the lack of development in terms of developing core capacities for dealing with radionuclear hazards since such hazards can come not only from nuclear installations but also from

facilities and activities that involve radiation or radioactive material used for agricultural, industrial, medical, scientific and other purposes, nuclear security events and other radiation emergencies.[42] The threat of nuclear weapons is still looming in Asia with North Korea as a nuclear weapon state that does not adhere to the Treaty on the Nonproliferation of Nuclear Weapons (it withdrew in 2003) or to the SEANWFZ or to ASEAN's Treaty of Amity and Cooperation. There is still speculation about the impact of the 2018 US-North Korea Summit on the denuclearization of North Korea.

Figure 7. Gaps in Capacities for Public Health Events at Points of Entry and Health Hazards of ASEAN Member States, 2016



Source: WHO, Global Health Observatory

The possibility of the use of the Chemical Weapons Convention-banned VX nerve agent in Malaysia puts forward the possibility that ASEAN member states are vulnerable to the proliferation of chemical weapons. Although Malaysian authorities were able to detect and identify the chemical weapon used, the question on how the nerve agent was acquired, transferred to or developed for use remains. The incident should serve as a reminder for ASEAN countries to address the capacity gaps towards achieving core capacity for chemical hazards. By November 2017, the East Asia Summit which includes ASEAN member states, Australia, China, India, Japan, New Zealand, Russia and the US released a Leaders' Statement on Chemical Weapons with specific reference to encouraging international cooperation on chemical weapons counter-proliferation and the development of laboratory capacities. Although the IHR was not invoked in the statement, it committed the East Asia

Summit leaders toward "strengthening health systems…for effective response to health-related hazards, including biological, chemical, radiological-nuclear hazards and emerging threats.[43]"

CONCLUSION

Given the above, ASEAN as a regional political entity, is developing into a proactive regional grouping. In terms of pandemic preparedness, ASEAN member states, especially those with developing and transitioning health systems are progressing towards building and strengthening their capacities for detection in both animal and human health, and capacities for health hazards (food safety, zoonosis, chemical, radionuclear) and public health events at points of entry.

Strong health systems are the foundation of effective disease control and the implementation of the IHR should support and complement health system strengthening. This poses a challenge within ASEAN, where there are wide gaps in core capacities. ASEAN member states in the very high and high human development groups have made inroads in their core capacities particularly because of relatively strong and effective health systems governed and driven by historically firm political leadership. However, member states in the medium and low human development group have weaker and more fragile health systems, still overwhelmed with the burden of infectious diseases, embedded in socioeconomic inequalities, lack of resources and internal socio-political conflicts. These observations point to an urgent need to also develop strong technical exchange and assistance programmes whereby the more prepared ASEAN countries can provide the necessary support to less well-prepared countries. In the context of regional stability, pandemic preparedness and resilience, achieving IHR core capacities through health systems strengthening should be given a high priority within ASEAN.

However, there are certain opportunities for improved IHR implementation in the future. The AADMER offers a gateway towards a multi-sectoral approach to pandemic preparedness, one that goes beyond the health sector and towards inclusive and coordinated emergency responses. There is an increasing trend towards integrating pandemic preparedness and response with disaster management and emergency response, with the establishment of the AHA Centre, the ASEAN Risk Communication Resource Centre, the ASEAN Centre for Military Medicine, and the ASEAN Coordinating Centre for Animal Health and Zoonoses. These regional centres are the first steps towards further institutionalising health system resilience and pandemic preparedness in the long run. Increasing the public's awareness of the objectives and activities of these emerging regional health security institutions is necessary to muster public support not only for campaigns to further build health systems, but also for building towards an ASEAN Socio-Cultural Community. The region is not as developed to financially support health systems strengthening without the support of external donors but each country has abundant lessons in dealing with disasters and epidemics. The challenge however remains in sustaining such a multi-sectoral and collaborative framework, and more so in sustaining financial, logistic and technical support from international organizations and multilateral and bilateral initiatives.

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ANNEX

Acronyms:

AADMER	ASEAN Agreement on Disaster Management and Emergency Response
ADB	Asian Development Bank
AHA Centre	ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management
APSED	Asia Pacific Strategy for Emerging Diseases
APT	ASEAN Plus Three (China, Japan, South Korea)
ASCC	ASEAN Socio-Cultural Community
ASEAN	Association of Southeast Asian Nations
ASEAN1	Singapore, Brunei, Malaysia and Thailand
ASEAN2	Indonesia, Vietnam, Philippines, Laos, Cambodia, Myanmar
ASEAN6	Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand
CMLV	Cambodia, Myanmar, Laos, Vietnam
DELSA	Disaster Emergency Logistic System for ASEAN
EOC	ASEAN Emergency Operations Centre
FETP	Field Epidemiology Training Programme
GDP	Gross Domestic Product
GHSA	Global Health Security Agenda
GOARN	Global Outbreak Alert and Response Network
HDI	Human Development Index
HPAI	Highly Pathogenic Avian Influenza
IHR	International Health Regulations
MBDS	Mekong Basin Disease Surveillance
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
SARS	Severe Acute Respiratory Syndrome
SDG	Sustainable Development Goal
SEANWFZ	Southeast Asian Nuclear Weapon Free Zone
UN	United Nations
USAID	United States Agency for International Development
VX	venomous agent X
WHO	World Health Organization

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Sustainable Development Goals in Sierra Leone: Multisectoral Action to Address Persistent Health Challenges

Lauryn Garrett, Arwen Barr, Sowmya Kadandale, and Robert Marten

By design, Sustainable Development Goal Three is unachievable by the health sector alone; instead, it requires coordinated effort harnessing commitment and action across sectors. As one of the most critical health priorities in Sierra Leone, high maternal mortality represents manifestations of deep, systemic and structural bottlenecks to achieving progress towards the health-related targets of the SDGs. In this analysis, we identify key linkages between maternal mortality in Sierra Leone and SDG thematic areas. Through this analysis, leverage points across sectors are identified to target multisectoral action towards reducing maternal mortality, and more broadly improving overall health and well-being. Three recommendations are highlighted to facilitate more effective approaches to multisectoral collaboration: Understand and clarify roles of various actors to identify shared interests and opportunities for coordination; develop an effective means of tracking, monitoring, and evaluating progress towards health as a foundation for accountability; and strengthen accountability and regulation of multisectoral action through incentives and penalties. The aim of this article is to inform future policy dialogue and negotiations towards achieving a multisectoral approach for health, and subsequent improvements in persistent health challenges in Sierra Leone.

INTRODUCTION

The theme of health and well-being, captured in but not confined to Sustainable Development Goal Three (SDG 3), is one example highlighting how health determinants, outcomes, and interactions can be traced across sectors. By design, SDG 3 is unachievable by the health sector alone; instead, it requires coordinated effort harnessing commitment and action across sectors. As in many resource-limited and conflict-affected settings such as Sierra Leone, efforts to achieve progress towards health and development operate within a context of complex gaps and challenges embedded in weakened structures, systems, and institutions[1]. These weaknesses are manifestations of the lasting impacts of a decade long civil war, coupled with recent economic and health shocks. This landscape presents a number of bottlenecks to achieving progress towards improving, promoting, and protecting Sierra Leoneans' health and well-being. Others have described in more detail Sierra Leone's historical, political, and economic context; national health priorities; resilience following civil war and public health emergencies; and the impacts of the recent Ebola outbreak[2,3,4,5,6].

Despite some gains, serious challenges remain in a number of national health priority areas in Sierra Leone - one of the most acute being maternal mortality. The estimated maternal mortality ratio (MMR) is 1,165 per 100,000 live births; one of the world's highest estimated MMRs[7], remaining drastically above the global average of 216 deaths per 100,000 live births, and even further from the SDG 2030 target of 70[8]. This is especially evident when comparing MMR in other countries in the region, for example Ghana's MMR was 229 in 2015[9]. In response, the Government of Sierra Leone (GoSL) has prioritized maternal and child health post-Ebola, building on the existing Free Healthcare Initiative (FHCI) established in 2010 for pregnant women, lactating mothers and children under the age of five[10,11]. Despite these commitments and interventions, maternal mortality remains critically high[12,13,14]. The persistence of this public health crisis is in part due to deeper challenges embedded within and extending beyond the health sector.

A startling 80 percent of reported maternal deaths in Sierra Leone occur in facilities[15]. Though this does not speak to the maternal deaths that go unreported and likely

occur in the community, it does indicate gaps in the: quantity of skilled healthcare professionals, quality of care provided, availability of basic amenities at health facilities, and medical supply chain management[16,17]. The immediate causes of maternal mortality only paint part of the picture, as it is well known many risk factors begin long before pregnancy. Social determinants of health spanning SDG 1 through 7 (including poverty, family planning and access to clean water) strongly influence a woman's likelihood of achieving a healthy pregnancy and delivery[18]. Better education, reduced fertility rates, and urbanisation, among other improvements, can also significantly reduce maternal mortality[19]. Limited availability of appropriate infrastructure and basic amenities (roads, electricity, information and communication infrastructure, and housing) in communities and health facilities as well as low literacy rates in the country are also factors more broadly contributing to maternal mortality and poor health outcomes [20,21,22,23,24].

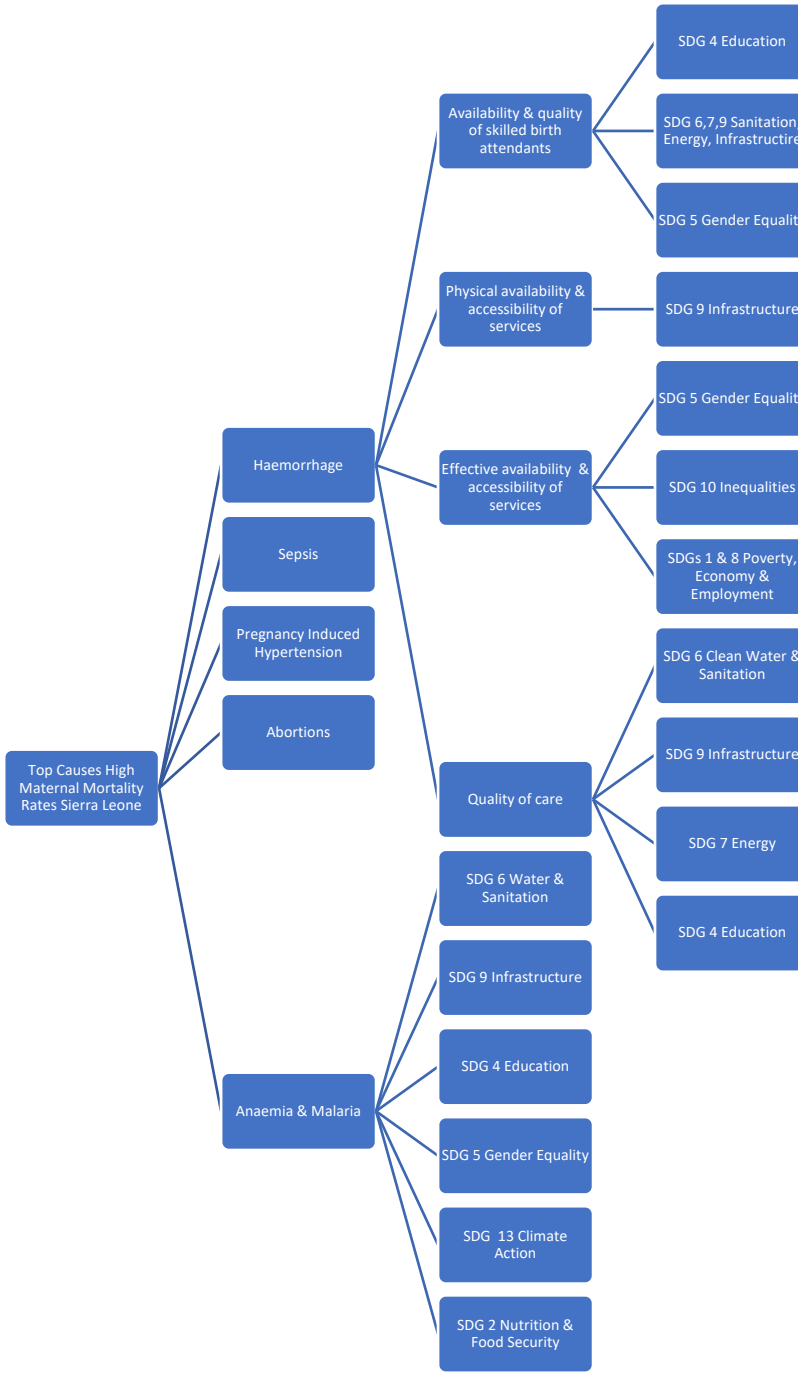
Further impacting maternal mortality and severely restricting the service delivery capacity of the health system is a critical shortage of health workers across cadres, facilities, and districts[25]. Key human resources for health (HRH) challenges include a maldistribution of healthcare workers (HCWs) between rural and urban areas; inappropriate skill mixes; a large proportion of HCWs in the public sector receiving no salary, benefits or entitlements from the GoSL; and limited regulation of the health workforce[26]. Many of these problems are connected with challenges rooted beyond the health sector.

As one of the most critical health priority areas in Sierra Leone, high maternal mortality represents manifestations of deeper systemic and structural barriers to achieving progress towards the health-related targets of the SDGs. In this analysis, we identify key linkages between maternal mortality in Sierra Leone and SDG thematic areas. Through this analysis, we aim to identify leverage points across sectors to target multisectoral action towards not only reducing maternal mortality rates, but more broadly improving health and well-being. We conclude by suggesting potential linkages to facilitate more effective approaches to multisectoral collaboration.

MULTISECTORAL LINKAGES: SDGS AND MATERNAL MORTALITY

No country can move towards SDG 3 through the health sector alone without accompanying transformations in social and economic development[27,28]. We have identified several SDGs linked to maternal mortality in Sierra Leone to illustrate this point, orient our discussion, and emphasize the need for a multisectoral approach. From the top causes of maternal mortality in Sierra Leone we extrapolated key causal linkages spanning SDGs (figure 1).[29] WHO has categorized three broad country contexts in terms of strengthening health systems to achieve Universal Health Coverage. According to the 'FIT strategy', Sierra Leone is in the 'foundations' stage rather than the 'strengthening institutions' or 'supporting transformations' stage[30]. Strengthening health systems foundations is appropriate in a least-developed and fragile country context with poor health system performance and negligible fiscal space to increase public spending on health[31]. Applying this FIT strategy and the International Council for Science's analysis on SDG Interactions to guide our decision-making process, we selected four SDGs to frame our analysis of opportunities for multisectoral action for improvements in maternal health and broader health system performance in the country[32,33]. The four SDGs identified as most relevant for reducing maternal mortality in Sierra Leone are: Quality Education (SDG4), Gender Equality (SDG 5), Clean Water & Sanitation (SDG 6), and Affordable & Clean Energy (SDG 7). Selection of these priority areas is consistent with global and sub-Saharan Africa specific studies on MMR that have found these areas to be among several factors determining maternal mortality[34,35,36,37].

Figure 1. Diagnosing key SDG linkages with maternal mortality in Sierra Leone



SDG 4: Quality Education

Quality education has both short and long-term impacts through immediate behaviour change as well as increased income, opportunity, and empowerment[38,39]. In Sierra Leone, roughly half of the population (51 percent of women and 41 percent of men) have not completed any formal education and only 5 percent of men and 2 percent of women have completed secondary school[40]. Low education rates, contributing to exclusion from public positions, negatively effects women's abilities to contribute or participate in decision-making, including having a voice regarding their healthcare[41]. Education is of paramount importance to mothers in Sierra Leone as it is associated with increased health literacy, greater power in health decision-making, increased use of family planning methods, and reduction of teenage pregnancy rates; all factors related to maternal mortality[42,43,45].

SDG 5: Gender Equality

Issues of gender inequity in Sierra Leone extend beyond the gendered-disparities in literacy rates and achievement of higher education described above. More than half of Sierra Leonean women have experienced intimate partner violence within the last year, and female circumcision rates are 94 percent in rural areas[46]. A woman's power in health-decision making and allocation of household resources determines her ability to advocate, protect, and act on her and her family's health[47]. Connected to human resources for health, the availability of women to enter the health workforce is linked to representation of women in higher levels of education and women having the time, resources, and power in households and communities to participate in education and employment[48].

Water and sanitation, energy, quality education and gender equality create conditions with far reaching benefits to health, nutrition, economic growth, and sustainable development. Addressing the issues underlying the persistent rates of maternal mortality are complex, political, and cannot be accomplished by efforts from the health sector alone[49,50,51]. Recent approaches to addressing these issues have largely been siloed to specific health programmes and interventions[52,53]. Progress in reducing maternal mortality and more broadly improving population health outcomes will require harnessing of multisectoral action to address the inextricable structural, social, and environmental dimensions of health.

SDGs 6 & 7: Clean Water, Sanitation & Reliable Energy

The percentage of the population with access to improved sanitation and water sources has been steadily increasing since 1990; however, stark inequities in access are still present. Only 63 percent of the population have access to improved water sources, and only 10 percent have access to improved sanitation and hygiene[54,55]. This has serious implications to health and all stages of pregnancy due to increased maternal risk for infections including sepsis - one of the leading causes of maternal mortality[56,57]. Furthermore, in 2011, only 18 percent of health facilities had access to a reliable power supply[58]. Limited availability of reliable power sources, clean water, and sanitation infrastructure at health facilities acutely impact patient and provider safety and the quality of care HCWs can deliver and contribute to poor maternal health outcomes[59]. In recent years, a number of facilities have had renovations and equipment upgrades without mechanisms for regulation and maintenance. This is an example of challenges that have manifested from variability in partner and

stakeholder accountability and limitations faced by coordinating ministerial bodies in monitoring and regulating this[60].

DISCUSSION

The example of maternal mortality discussed above highlights how achieving progress towards top health priorities in Sierra Leone depends on strengthening efforts across and within sectors. We now transition our discussion to broader sector-wide enablers and barriers of the multisectoral action needed to support this progress. Strengthening capacity for multisectoral action at this level will contribute to improvements across health outcomes in Sierra Leone, including maternal health and survival[61,62].

Recognition of the importance of multisectoral action for health within health policies and plans is necessary but insufficient to effectively integrate multisectoral action throughout planning, implementation, and monitoring processes. Accountability, transparency, and trust across and between levels of leadership and governance; mechanisms for monitoring implementation progress across sectors; political will, leadership, and collaboration across levels and sectors; and integration of partners' roles in planning, implementation, and monitoring processes are all critical features of effective governance of multisectoral action for health[63,64,65].

Barriers to Multisectoral Action

Predominant barriers to effective integration and application of multisectoral action in Sierra Leone include: limited accountability and transparency[66,67,68], lack of trust between and within sectors[69,70], a fragmented system and redundancy of efforts across sectors[71,72], and a high dependency on external partners and donors[73,74]. Similar contexts to Sierra Leone have also found barriers to multisectoral action for health to include: a lack of political will, challenges in governing implementation processes, and fiscal restrictions[75]. Although understudied in countries of similar contexts, disincentives to multisectoral action for health include the political challenges associated with connecting different sectors with discrepant interests, budgetary guidelines, funding restrictions, and disciplinary cultures[76].

The Ebola epidemic and its aftermath brought a proliferation of resources and efforts to the health sector. Given this attention, countless critical documents, plans, and strategies have been developed and launched to varying standards and degrees of implementation[77]. This rapid expansion of health and development priorities, plans, actors, and partners in Sierra Leone contributes to fragmentation of the sector, impedes coordination of efforts to improve health and well-being, and contributes to inefficient allocation of human and financial resources[78,79,80,81].

National and community ownership and sustainability of programs are undermined by a high dependence on external development partners and donors in the country[82,83,84]. Even prior to the influx of resources and funding that occurred during the Ebola response, over 449 million USD of net official development assistance (ODA) was received by Sierra Leone in 2013, representing over nine percent of GNI[85]. These values roughly doubled during the Ebola response[86]. Weaknesses with the system, perceived lack of transparency, and gaps in local capacity are reasons contributing to external actors implementing parallel structures and vertical programmes that both introduce and exacerbate fragmentation[87,88,89,90,91,92]. High donor dependence leaves the country vulnerable to both unsustainable programmes and distorts the national agenda towards donor priorities[93].

Opportunities for Multisectoral Action

To help redress some of these challenges, the GoSL has launched programs focussed on improving government planning, and policies and programmes affecting community health. The GoSL launched the Service Level Agreement approach (SLA) in 2015 to improve government and external partner planning. These agreements are intended to ensure consistency, coordination, and accountability of planned partner activities and interventions aligned with Ministry priorities and complementary to existing health sector activities. Although the GoSL introduced SLAs to streamline activities and improve coordination, poor communication among levels of governance and limited monitoring and accountability of SLAs have reduced the effectiveness of these agreements in promoting and governing multisectoral collaboration[94]. Gaps in governance capacity, as seen with the SLAs, and the consequential lack of trust in governing and coordinating bodies inhibits effective multisectoral collaboration at every level and interaction point[95].

A second example of an opportunity for more effective multisectoral action for health in Sierra Leone is the Free Healthcare Initiative (FHCI) which has been one of the most significant health reforms in the country[96]. It was introduced in 2010 to abolish out of pocket expenses for pregnant women, lactating mothers, and children under five[97,98]. The FHCI initiative responded to a clear community health need in Sierra Leone, it brought funds and momentum to produce important systemic reforms that contributed to a decrease in under five mortality[99]. Underlying this achievement was strong political will, enhanced donor cooperation, and consensus among stakeholders[100]. Challenges to the success of this initiative include a breakdown of communication and coordination between the Cabinet, Ministry of Finance and Economic Development (MoFED), and the MoHS, along with limited accountability and transparency[101,102,103]. The FHCI is also heavily donor dependent with 80 percent of financing coming from external sources in 2015[104], which raises serious concerns about sustainability. Adopting a multisectoral approach to the FHCI could involve leveraging appropriate coordination structures between stakeholders and introducing a monitoring and evaluation system to support accountability and transparency.

Examples of Multisectoral Action for Health in Sierra Leone

Amidst these challenges, barriers, and opportunities, Sierra Leone has taken action in applying a multisectoral approach across several programmes, including the sub-sectors of Nutrition[105] and Reproductive, Maternal, Child and Adolescent Health (RMNCAH)[106]. The strategic plans for these programmes demonstrate several qualities supportive of effective multisectoral approaches to health[107,108]. They integrate their strategies into the national development agenda, aligning and harmonizing objectives across sectors such as agriculture and education, finance, water, sanitation and hygiene. Within the plans, coordinating mechanisms between the national, district, and community level are prioritized, and an inclusive list of relevant development and implementation partners are outlined. Nutrition-related successes achieved through multisectoral action include a policy on child feeding practices, international code for marketing breastmilk substitutes, and the baby friendly hospital initiative. RMNCAH-related successes achieved through multisectoral action include the FHCI reform, a near twenty percent increase in the presence of skilled birth attendants, and the recently launched Maternal Death and Surveillance Response (MDSR) report[109,110,111].

Promising efforts to harness multisectoral action in Scaling Up Nutrition (SUN) and anaemia reduction programmes in Sierra Leone provide (1) insight into context-specific

facilitators of multisectoral action for health and (2) a sense of existing multisectoral coordination and collaboration structures and processes[112]. In the case of anaemia reduction efforts in Sierra Leone, facilitators of multisectoral action have included: building an agenda based on a context-specific landscape analysis; mobilization of multisectoral commitment; establishment of a cohesive coordination structure - the National Anaemia Working Group (NAWG) - with representation of diverse stakeholders; and demonstrated support, leadership, and involvement of key stakeholders and government staff[113]. Barriers and challenges in coordinating and advancing a multisectoral approach to anaemia-related activities in Sierra Leone included funding constraints and limited early engagement of the finance sector, competing priorities, misalignment of sectoral mandates, and accountability of stakeholders and challenges faced by the NAWG in monitoring this[114].

These examples demonstrate recognition of the importance of multisectoral action for health in Sierra Leone and illustrate how this approach has been integrated into health programme planning processes. In Sierra Leone, as with a number of other examples of multisectoral action for health, this approach has been limited to singular health issues[115,116,117]. In efforts to make long-term, sustainable improvements to health and well-being in the country, this approach must be scaled up to transcend sub-sector and programmatic areas[118]. The successful application of multisectoral action for nutrition and RMNCAH provides a starting point to learn from and build off to move towards a broader pursuit of multisectoral action for health.

RECOMMENDATIONS & STEPS FORWARD

Building on the integration of a multisectoral approach for nutrition and RMNCAH in Sierra Leone and drawing on lessons learned from case studies of multisectoral action in other countries[119,120,121,122], we have identified common themes supporting greater engagement in multisectoral action for health. Based on this analysis, we propose three recommendations to the Government of Sierra Leone and external partners as steps forward to facilitate an environment more conducive to multisectoral action in Sierra Leone. Focusing efforts on strengthening the following elements of governance and collaboration will extend multisectoral action beyond siloed policy and planning into collaborative implementable action.

Recommendation One: Understand and clarify roles of various actors to identify shared interests and opportunities for collaboration

An in-depth situational analysis that includes mapping interests, resources, and mandates of actors and stakeholders from across sectors would identify collaborative linkages and inform a more cohesive, efficient, and effective coordination of health system inputs and actors. This analysis could contribute to identifying mutual interests and moving forward with a shared vision for health across sectors with reduced fragmentation and duplication of efforts[123,124,125,126]. This would support harmonization and alignment of priorities in national, sector, and sub-sector plans and strategies and allow specific collaborative responsibilities required of external sectors to be outlined. A clearer picture of health sector activities is an essential precursor for effective monitoring of progress and holding various actors accountable. In Sierra Leone, SLAs are an example of a tool that could be used to support this mapping of interests and activities. Effective use of SLAs for this purpose, however, would require more rigorous monitoring, evaluation, and regulation of partner activities, as well as concrete accountability mechanisms for evaluations of activities outlined in SLAs.

Recommendation Two: Develop an effective means of tracking, monitoring, and evaluating progress as a foundation for accountability

The development of an integrated data system that captures indicators for monitoring progress and engagement across sectors has been a strategy used to support multisectoral action[127]. In Sierra Leone there are at least seven parallel health information systems and data collection initiatives currently operating[128,129], making monitoring and evaluation of progress and data quality across sectors challenging. Similar health information system problems such as parallel data systems and poor coordination and integration have been reported in Kenya[130]. Because of this, a health information system policy was introduced in Kenya in 2009 to integrate parallel systems, and progress towards harmonizing efforts and improving coordination has been reported[131,132]. Development of an integrated monitoring mechanism would support and strengthen evaluation of collaborative efforts, accountability, and governance of multisectoral action[133,134,135,136], and is a strategy in line with recommendations put forth by the MoHS[137].

Recommendation Three: Strengthen accountability and regulation of multisectoral action through incentives and penalties

Understanding the health landscape, identifying clear roles and responsibilities of actors, and developing a system for effectively monitoring activities and progress will not be sufficient in stimulating multisectoral collaboration without appropriate incentives, accountability, and governance. Monitoring of state and non-state actor activities in the health sector in Sierra Leone should be followed up with appropriate regulation and actors should be held accountable when agreed upon roles and responsibilities are not upheld. An example of governance for multisectoral action that involves legal power to mandate multisectoral collaboration comes again from Thailand, where a National Health Commission has been established, comprised of multisectoral public-policy makers, academics and professionals, and civil society organizations including the private sector. This tripartite constituency convenes an annual National Health Assembly (NHA) mandated by Law[138]. The NHA has been successful in collaborating with various actors and sectors involved in the social production of health, including marginalized groups in policy making[139].

When developing national strategic plans, roles and responsibilities for coordinators and implementers should be detailed along with mechanisms for guiding and motivating implementation across sectors. Planning should include appropriate support, resources, and incentives for collaboration[140,141]. Allocation of resources and distribution of incentives during planning stages to support public sector engagement has been an effective strategy for multisectoral collaboration in other countries[142]. As demonstrated in Thailand, incentives for collaboration could include subsidies or contracts[143] and could be introduced in Sierra Leone to enable and encourage multisectoral action initiated through the public sector. Capacity building within and across sectors and levels of governance to strengthen governance, implementation, and regulation of multisectoral action would support implementation of these recommendations.

CONCLUSION

SDG 3 to *ensure healthy lives and promote well-being for all at all ages* requires a coordinated effort harnessing commitment, action, and accountability across sectors. These sectors, spanning from water and sanitation to education, have far reaching effects on

population health as demonstrated through the analysis of maternal mortality in Sierra Leone. As discussed, challenges that have impeded effective multisectoral collaboration in Sierra Leone include: fragmentation and duplication of actors and activities in the health field, limited sustainability of programs due to high dependence on external donors, and limited accountability mechanisms. To integrate this work into real world governance in Sierra Leone, the recommendations for the Government of Sierra Leone and external actors include: Obtaining a better understanding of the actors and priorities operating in the health landscape, identifying clear roles and responsibilities; developing a cohesive cross-sector monitoring system; strengthening governance and accountability mechanisms, and building leadership capacity. These recommendations are feasible, realistic steps towards creating a more supportive environment for multisectoral action in Sierra Leone. This article is intended as a contribution to the situational analysis proposed in the first recommendation put forth in this paper, as an output of a governance analysis with the aim to inform future policy dialogue and negotiations towards achieving a multisectoral approach for health and subsequent improvements in persistent health challenges in Sierra Leone.

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Reforming International Health Agencies: Proposing an Inter-Disciplinary Approach through the Integration of Institutional Change, Network Analysis, and Power Theory

Eduardo J. Gómez

This article seeks to explore the utility of integrating institutional change theory with network and power theory in the social sciences in order to provide a fuller account of international health agency capacity to meet domestic healthcare needs. The application of institutional theory to the transformative capacity of international health agencies is a new area of scholarly research. This article used qualitative research methods, drawing from an in-depth literature review and select case studies to critique the existing literature and analyze the effectiveness of the author's proposed analytical framework. This article finds that institutional change theory on its own may not be sufficient for explaining international health agency transformations. Instead, scholars may benefit from combining this theoretical approach with network and power theory in the social sciences, theoretical frameworks that have mainly been used to explain institutional and policy change at the domestic rather than international level. Using the case of the Global Fund to Fight AIDS, Tuberculosis, and Malaria, this inter-disciplinary theoretical approach may help to better understand how change actors within international health agencies are able to adapt to external pressures and pursue policy reform.

Introduction

Understanding the ability of international health agencies to adjust and to effectively sustain their policy initiatives has been of growing interest to policymakers. Recently, however, the adaptive capacity of these agencies has garnered the interest of social scientists applying institutional theory to account for variation in bureaucratic and policy outcomes.[1,2,3] This article contributes to this literature by not only exploring the potential utility of institutional change theory but also the advantages of combining this theoretical approach with other analytical frameworks in the social sciences that could potentially help to further our understanding of how international health agencies adapt to challenging external environments.

Building on institutional change theories of *displacement* and *conversion*,[4] this article explains how the Global Fund to Fight AIDS, Tuberculosis, and Malaria (henceforth, the Global Fund) was able to transform its organizational structure and policies amidst increased international pressures from contributing donor nations. Institutional *displacement* and *conversion* theory, for example, helps to better understand how change actors within the Global Fund were able to strategically use international pressures in order to bolster their legitimacy and influence when seeking organizational and policy reform.

Nevertheless, this article claims that institutional change theory on its own may not be sufficient for explaining why change actors have so much influence. It is argued that a potential complementarity to this theoretical approach is how these actors use their global networks of support to *further* augment their organizational influence. Network theory in the social sciences exposes researchers to how the capacity of individuals within a group and their relationship with others generates a collective resource that can be used to empower those organizational actors seeking reform. *Power* theory, on the other hand, informs researchers of the institutional advantages of combining the possession of resources with specified motives for reform.[5] Combining network and power theory with the aforementioned institutional change literature may therefore provide a fuller account for how change actors within international health agencies are successful at reforming their organizational structures and policies in response to challenging external environments.

METHODOLOGY

This article conducted a qualitative methodological approach to research. With respect to data, the author relied on primary literature obtained from the Global Fund and secondary literature obtained from peer-reviewed journal articles, books, and working papers. The Global Fund case study was selected for two reasons: first, the ample amount of published information discussing recent reforms; and second, the Global Fund's sound illustration of the proposed analytical framework. In line with an *analytical narratives* methodological approach,[6] the Global Fund case study was also used to illustrate the potential applicability of the author's proposed theoretical approach, rather than to test and propose alternative hypotheses.

ESTABLISHING AN INTER-DISCIPLINARY THEORETICAL FRAMEWORK FOR EXPLAINING INTERNATIONAL HEALTH AGENCY TRANSFORMATIONS

Recently political scientists have explored the conditions under which institutions are transformed for greater efficiency.[7] [8] [9] Several theoretical perspectives have emerged, ranging from the sudden affects that shifts in the international environment have on institutions, to how external conditions combine with change actor strategies to gradually pursue institutional change.[10]

For example, some scholars have emphasized how international pressures and crisis conditions empower change actors to pursue institutional change. Institutional *displacement* theory,[11] for example, posits that these types of exogenous conditions facilitate these actors' ability to supplant preexisting institutions with new ones. Here, actors strategically use international pressures and criticisms in order to delegitimize existing institutions and their supporters, in turn increasing actors' legitimacy and influence when seeking reform.[12] Alternatively, an instance of institutional *conversion* occurs when actors use a change in the external environment to repurpose existing institutions and policies;[13] a sudden rise in international pressures and criticisms legitimize their actions, while facilitating their ability to build political support.[14]

However, when it comes to understanding reform processes within international health agencies, few have considered how these institutional change theories can be used to explain bureaucratic and policy change. For example, some scholars have instead focused on the skills of managerial leaders within agencies, specifically how they lead workers into adopting organizational and policy procedures, as seen with the WHO during the 1990s.[15] Alternatively, others focus on how international organizations pressure international health agencies into engaging in organizational management restructuring. During the 1990s, for example, the World Bank pressured the WHO into adopting neoliberal approaches to organizational efficiency.[16] Nevertheless, this literature has neglected to explore how the aforementioned institutional change theories can help to provide additional insights into how change actors within agencies work with the international community to pursue reform and the different strategies that they employ to achieve this.

In contrast, Gómez (2013)[17] has addressed these issues by arguing that the application of institutional change theories can help to account for the transformation of international health agencies. Specifically, Gómez (2013)[18] illustrates how through an instance of institutional *conversion*, change actors within the World Bank's International Development Association (IDA) used an increase in international pressures from UNESCO and the WHO during the 1960s to transform the Bank's mandate from providing loans strictly for economic reconstruction purposes to include and expand existing lending procedures for anti-poverty and human development policies. IDA change actors achieved this by working with UNESCO and WHO officials to pressure the Bank governing board into converting its lending practices and procedures.[19] Alternatively, Gómez (2013)[20] explains

how Nay's (2012)[21] work on the transformation of UNAIDS during the 1990s illustrates a process of institutional *displacement*, where a heightened increase in international criticisms and pressures of the agency's inability to adequately respond to nations' HIV/AIDS policy needs both encouraged and facilitated the UNAIDS Secretariat's ability to replace prior organizational procedures with new ones. These procedures included enhanced performance-based standards, increased inter-agency coordination, increased transparency in funding and policy decision-making.[22]

This article comports with Gómez's (2013)[23] view that the aforementioned literature discussing the transformation of international health agencies does not address how change actors within them strategically interact with and use the international community to pursue reform, instead seeing agency transformation as the product of either change actors' managerial strategies or coercive international pressures. Nevertheless, the author's proposed analytical framework goes beyond this, as well as Gómez's (2013)[24] analytical approach, by emphasizing alternative international and organizational factors that this literature has yet to consider. For example, this literature does not consider how global networks of state and non-state actors, such as international organizations, NGOs, and the private sector are important for change actors within international health agencies. Consequently, the aforementioned literature has not provided insight into the *emergence* and *composition* of these global networks, i.e., how similar ideas and policy interests arise and consolidate their collective efforts, the reasons for their source of influence, and the types of relationships they have with international change actors. This literature also overlooks the international origins of change actor power within international health agencies: that is, how these global networks provide an additional resource – beyond financial and technical – that actors can use to further enhance their ability to pursue institutional change. And finally, this literature provides no insight into understanding the international origins of institutional change processes.

The Advantages of Integrating Power, Network, and Institutional Change Theory

Filling in this lacuna in the literature, the author proposes an analytical framework that addresses these questions by unifying power, network, and institutional change theory when explaining the transformation of international health agencies. This framework provides an inter-disciplinary analytical perspective that makes change actor power a *product* of their global environment.

Traditional analyses of *power* and network theory have often focused on domestic institutional change processes, such as power within bureaucratic agencies or how power spreads out among interconnected agencies and/or private, civil societal organizations.[25] [26] Mahoney (2004)[27] claims that reform actors are capable of sustaining or readily transforming institutions when they possess a combination of resources and clear motive. This conception of power has traditionally been applied to domestic institutions, more recently in the area of public health, where a concentration of power by a particular political and/or bureaucratic agency leader can lead to expeditious bureaucratic innovations in response to health epidemics.[28]

Alternatively, network theory has focused on the processes through which actors share resources, collectively leading to a source of power for institutional and policy change.[29] According this literature, power is defined as the capability of actors within their network to collectively achieve their desired goals, and how resources are distributed within the group, thus determining which individual or group of individuals has the most resources (financial or ideational) and, therefore, authority.[30,31] Policy networks typically involve a group of inter-dependent institutions and/or individuals sharing similar resources, interests, motives, and ideas. According to Adam and Kriesi's (2010)[32] proposed typology, network analysis also entails looking at the *composition* of actors (that is, their capacity)

and the structure of their relationship between each other. Networks are most effective when they operate in a tightly linked corporatist structure, exhibiting a high level of hierarchy, trust, cohesion, and communication.[33,34] For our purposes the key lesson to take from this literature is that individual change actor power is the product of a closely inter-connected network of similar resources, interest, ideas, and perhaps normative commitments to achieving a common policy goal.

While network theory has mainly focused on domestic policy-making, I argue that these theories may also be applied at the global level. One can just as easily envision the rise of inter-connected multi-lateral health agencies and non-state actors working together to influence health policy *within* international health agencies, such as in response to worsening health inequalities and pandemic health threats.

In this context, change actors within international health agencies have a diverse network of authority among international actors that they can use to provide them with the additional power needed to transform their international agencies. When a new window of opportunity emerges, such as the rise of international pressures from external donors and governments, reformers may move away from traditional sources of power, such as their budgetary finances, technical knowledge and experience, towards supportive networks of power at the international level. I argue that using these external networks can help to further augment change actors' legitimacy and influence and that this *further compliments* their efforts to use shifts in external circumstances to embolden their cause – as emphasized by institutional *displacement* and *conversion* theory.

We therefore arrive at an inter-disciplinary analytical framework providing a potentially more robust explanation for how international health agencies pursue institutional change.

As Figure 1 illustrates, scholars may benefit from combining network and *power* theory with institutional change theory. In this approach, when analyzing change actor strategies, analysts apply network theory to understand how the change actor's efforts to establish global networks of support further embolden these actor's organizational influence; this then leads the analyst to employ power theory in order to show how a combination of global networks, the ideational and financial resources that emerge from them, and change actors' goals help to further achieve their cause. Finally, one then connects power theory to institutional change theory by focusing on and combining change actors' degree of organizational influence, in part derived from these global networks and resources, with their specific motives and aspirations, and how this, in turn, facilitates the adoption of particular strategies for institutional change, such as *displacement* and *conversion*—the dependent variable of interest. Combining these theoretical perspectives may therefore provide a fuller account of how change actors within international health agencies are capable of pursuing institutional change in a context of challenging external circumstances.

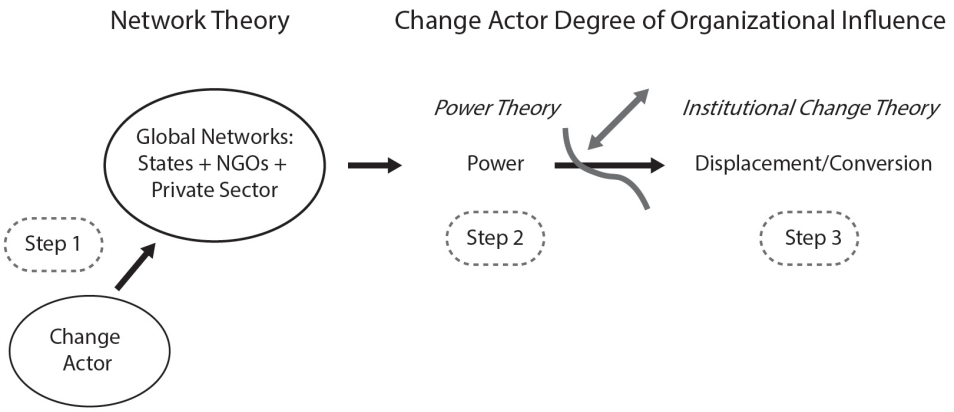
UNDERSTANDING THE GLOBAL FUND'S TRANSFORMATION

Created in 2003 with the support of the Bill & Melinda Gates foundation, the Global Fund is a non-UN institution – according to Swiss law, it is technically classified as a "foundation" – providing grants to country principle recipients (PR), both state and non-state actors. In contrast to most donors, the Global Fund's mandate is to increase country ownership over grant management, policy reform and implementation, while ensuring that civil society is actively involved in the grant application and implementation process.

Despite 10 rounds of grant funding, by 2010 the Global Fund encountered an organizational crisis. Following rumors that millions of dollars were lost due to corruption and poor grant management at the PR level, the Global Fund board called on its Inspector General (IG) to investigate the situation.[35] The IG office found that approximately $US 34 million in grant money had been lost due to financial corruption and mismanagement [36,37,38]

in countries such as Mauritania, Mali, Djibouti, and Zambia.[39,40] In March 2011, the Board requested the formation of an Independent Review Panel.[41] The Review Panel found several discrepancies and recommended that new policies and regulations be implemented.[42,43]

Figure 1: Combining network and power theory with institutional change theory



What resulted was a series of international allegations, pressures and criticisms. In addition to well-known media establishments, such as *Fox News*,[44] external Global Fund donors, comprised of member states, NGOs, philanthropists, and the private sector, immediately criticized the Global Fund Board, accusing it of financial mismanagement.[45,46] By 2011, major donors to the Global Fund, such as Germany, decided to cease payments.[47,48] The Governing Board quickly found itself in a state of crisis and illegitimacy within the international community.

The Board quickly realized that it needed to pursue reforms in order to regain the trust of donors and the international community. In November 2011, the Board approved a *Consolidated Transformation Plan*, which addressed the findings and policies recommended from the Independent Review Panel.[49,50] Yet, the key change actor leading reforms was not its Executive Director, Michel Kazatchkine, but instead a Colombian banking executive by the name of Gabriel Jaramillo. In January 2012, Jaramillo was appointed by the Board as the General Manager responsible for implementing the *Consolidated Transformation Plan*.[51]

Empowered by the Governing Board, and building on the wave of optimism surrounding his appointment as well as Bill Gates' expressed confidence in the Global Fund through a pledge of $US 750 million in March 2011,[52] Jaramillo moved to implement several institutional and policy reforms, as proposed through the *Consolidated Transformation Strategy*.[53] [54] In addition to creating several new policies, he succeeded in *re-purposing* several existing institutions and policies for greater efficiency and effectiveness in providing country grants and managing them. First, to ensure that country grants were better managed, Jaramillo assigned existing staff members with the additional responsibility of closely managing the grant implementation process and performance.[55] Approximately 75% of the Secretariat's staff now work in the grant management and strategy, investment, and impact divisions.[56]

Furthermore, through the Board's introduction of a New Funding Model (NFM) in November 2012, the Technical Review Committee (the body mainly responsible for approving and recommending grant disbursements to the Governing Board), and the Governing Board were required to supplant the existing Rounds grant structure with an

automatic 3 year grant award; [57,58] under this 3 year grant model, principle recipients are also allowed to re-apply for funding, through the submission of a concept note, at any time.[59] The goal was to improve Global Fund grant coordination with a country and/or NGOs' financial needs.[60] Moreover, the NFM prioritized providing grants to those countries with the highest disease burden and the least ability to pay.[61,62,63] The NFM model was expected to begin in 2013.[64]

New policy initiatives were also created. First, the Global Fund implemented policies for risk management. Specifically, the Global Fund has adopted a "new operational risk management approach," which includes the creation of risk profiles.[65] This approach assesses each grant's operation and the factors that contribute to these risks, such as a) treatment disruptions; b) poor quality of health services; c) inadequate PR reporting and compliance; d) poor quality Monitoring & Evaluation (M&E) and data management; and e) sub-standard health products.[66] The Global Fund will also closely monitor procurement and supply-chain management risks, which account for approximately 40% of the Fund's disbursements and are especially vulnerable to fraud.[67]

And to help ensure that the management of future grants is strengthened, in 2012 the Governing Board also required that Global Fund staff become more directly involved in the grant formulation and application process, rather than expecting CCMs (Country Coordinating Mechanisms) to do this on their own.[68] This, in turn, requires that the Secretariat's office and Fund portfolio managers strengthen their interaction with principle recipients.[69,70] Global Fund staff members are also tasked with the responsibility of making periodic country visits to ensure that grant money is used effectively.[71] Finally, the Global Fund's organizational leadership changed.[72] In December 2012, Dr. Mark Dybul was appointed as the new Executive Director of the Global Fund. Dybul brought a lot of experience as former director of the U.S. PEPFAR program.

In sum, the Global Fund's transformation provides a good example of institutional *conversion* processes.[73] Institutional conversion arises when reform actors within institutions strategically use changes in the external environment, such as the rise of international pressures, in order to bolster their credibility and influence, while repurposing existing institutions for new policy ends.[74] Repurposing institutions, that is, using existing committee structures and staff for alternative goals is perceived as a more cost effective, less politically contentious strategy.[75] In the case of the Global Fund, it was General Manger Gabriel Jaramillo, and supportive Governing Board members, that engaged in this process.

Jaramillo and the Board's power and influence stemmed not only from their position within their organization, their experience and resources, but also from their relationship with a powerful network of global actors. These reformers relied on a highly cohesive group of state and non-state actors that not only contributed financially to the Global Fund but were also united through similar policy ideals and goals – to eradicate AIDS, TB, and Malaria. For years, the Global Fund also had the unwavering support of influential individuals believing in its mission, such as Bono, Jeffrey Sachs, Bill Clinton, Bill Gates, and Zachie Achmat.[76] It was this global network of united, influential contributors to the Global Fund that Jaramillo and the Board aligned with and used to further embolden their cause when striving for reform.

Indeed, after extensive discussion with his external network of supporters, in an interview with the author, Jaramillo indicated that the Gates Foundation and international private sector firms, such as the McKinsey and Boston Consulting Group, were supportive of his efforts.[77] These supportive networks worked directly with Jaramillo, not the Global Fund's Board, and further empowered his ability to transform the organization's policies.[78] Moreover, Jaramillo claimed that in a context where the Global Fund's external donors were losing influence and credibility, these additional networks of like-minded supporters proved to be helpful in achieving his endeavors.

DISCUSSION

The study of applied institutional theory to the transformation of international health agencies is a new area of scholarly research. This article has attempted to contribute to this growing literature by conducting an inter-disciplinary analytical approach through the unification of power, network, and institutional change theory in order to account for reform processes within the Global Fund. This case study suggests that theories of institutional *conversion* may be effective in helping to understand how the Global Fund transformed in response to international pressures.

But where exactly did the Global Fund's change actors obtain their power and influence? This article has argued that a potentially more robust account of institutional change processes may benefit from combining institutional change theory with an examination of how like-minded, supportive global networks of actors provide agency reformers with the additional legitimacy and influence needed to achieve institutional *conversion*. As we saw with the Global Fund, change actors pursue the support of various state and non-state actors, each sharing resources in a common struggle to eradicate AIDS, Tuberculosis, and Malaria. This sharing of resources and interests in a global network of support for the Global Fund increased Jaramillo and the governing board's legitimacy, influence, and ability to pursue reform – and thus, further emboldened their organizational *power*. Hence, the Global Fund case study revealed that change actor power was not entirely the product of individual experiences, resources, and increased international pressures, but also the legitimacy associated with being a member of an influential global network of supporters.

However, a more critical and reflective point of view may suggest that in a context of organizational crisis, where donors of multilateral agencies and the media are pressuring for reform, agencies will inevitably reform. This certainly may have been the case for the Global Fund. However, the goal of this article has not been to explain "why" the Global Fund's transformation occurred but rather, "how." The author's proposed analytical framework was introduced to provide an alternative approach for better explaining how the Global Fund transformed; it was not intended for providing a justification for why it did. Nevertheless, future researchers should strive to compare the Global Fund to other international agencies that perhaps were not as successful in a context of organizational crisis and external pressures. Such a comparison would help to determine if the Global Fund is unique and if not, if the same casual factors in line with the author's proposed analytical framework were present.

My proposed analytical framework may also be used to understand why some international health agencies have been incapable of achieving reform. In contrast to the Global Fund, the World Health Organization (WHO), for example, has struggled to obtain the member state support and funding needed to reform its bureaucratic structure and policies.[79] Much of this stemmed from the crisis of legitimacy that has plagued the WHO in recent years, particularly after its failure to adequately respond to the West African Ebola crisis in 2014. However, organizational reformers, such as the WHO Director-General, Dr. Tedros Adhanom, have not had access to a strong international network of supporters. For instance, the international NGO community has been particularly critical and unsupportive, while nevertheless displaying unwavering support for other international health agencies, such as the Global Fund and The Gavi Alliance.[80] According to my proposed analytical framework, a supportive global network must first be present in order for reformers to have the organizational power needed to successfully engage in *conversion* processes. However, such transformations have yet to occur in the WHO.

Future research may wish to explore other types of institutional change theories and their interaction with international and domestic networks of power. My introduction of institutional conversion processes was done in order to provide an example of the

potential utility of institutional theory in accounting for international health agency transformation. But there certainly are a myriad of other institutional change theories that should be explored and applied to these international agencies. Furthermore, institutional *displacement* and *conversion* processes may not be applicable to cases in which agencies transformed in the absence of international pressures. Perhaps in this context, the emergence of supportive global networks can provide reform actors with the power needed to pursue reforms. Future research will need to explore if this has occurred in other agencies and what this means for our understanding of institutional change processes.

CONCLUSION

Better understanding how international health agencies transform themselves in order to meet new policy objectives may benefit from conducting an interdisciplinary institutional change, network, and power theory approach to research. As we saw with the Global Fund, this article has argued that by integrating institutional *conversion* theory with network and power theories, we may better understand how agency change actors are so successful in pursuing reforms. Future researchers may benefit from adopting this inter-disciplinary perspective, while carefully considering the types of international health agencies and contexts within which this approach can help to better understand the transformative capacity of these agencies.

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Inter-Institutional Relationships in Global Health: Regulating Coordination and Ensuring Accountability

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The global health landscape is characterized by a multitude of actors, including nation states, international organizations and non-governmental organizations, all of which play substantial roles in addressing global health issues. The range of organizations involved means a substantial heterogeneity with respect to their structure, mandate, legal standing, and obligations. As well as this diversity, they are substantially differentiated with respect to the power, influence, and the financial resources they are able to mobilize in order to advance their organizational mission. This variety also continues further through to the ability to determine accountability, with each organization differing in the stakeholders to whom it is accountable; some may be accountable to shareholders or a Board of Directors, while others will be accountable to governing bodies, national parliaments, or to the member states which comprise the organization. As such, concepts of accountability are often limited to ensuring accountability for the success of the organizational leadership in achieving the goals related to the mission of the organization[1]. Thus, the fundamental motivations of organizations are broadly "self-regarding" in nature. This issue, and how this range of actors may be governed in a truly global constitutional system has been considered by a number of scholarly perspectives, resulting in robust, academic discussions on what the global constitutionalized system in global health ought to look like.[2] However, one thing which has not yet been addressed fully in the literature, and which adds a distinct layer of complexity in current practice, without this fully formed constitutionalized system, is the fact that, when considering the relationships that organizations have with other relevant actors in the area; the extent to which enforceable obligations are owed between actors is unclear, and it is this which we focused on in the present paper. In this case we are not so much interested in beneficiaries of services provided by organizations, or services which have been formally contracted for between organizations, but rather, what sorts of obligations organizations have towards each other, beyond any contracted services.

This question is becoming increasingly important because, whilst such organizations typically work only within their pre-defined mandate, on some occasions, typically during an emergency event, a multitude of actors come together to work towards a common goal. A good example of how this can play out was evidenced in the Ebola outbreak of 2014-2016. The outbreak had all the chaotic features of a global health emergency, and brought a wide variety of actors to respond to the crisis, including: local civilian healthcare workers; voluntary foreign healthcare workers; domestic military forces; foreign military forces; private philanthropic organizations; international organizations; non-governmental organizations; universities; and foreign government departments. Fragmentation and poor co-ordination was characteristic of the early response, as were allegations of ineptitude, foot-dragging, and politically motivated decision making.[3] Even with an attempt by the World Health Organization (WHO) to develop some sort of coordination of action, this was still unsuccessful and lacking. Without an overarching understanding of the coordination of relationships, even attempts at ad hoc cooperation remain stunted.

In this paper we will explore issues related to the governance of inter-organizational relationships - taking the multi-layered response to the 2014 West African Ebola Outbreak as our point of departure. We note that, ideally organizations engaged in global health activity would have a clear set of governance rules that would guide their behaviors, and set expectations for collaborating with other organizations, though this is rarely the case. More broadly, we highlight that there is no overarching set of principles that would cover all the possible ways in which collaborations can take place. We conclude by suggesting some principles to guide collaboration between organizations engaged in global health in the future.

GLOBAL APPROACHES TO INTER-INSTITUTIONAL RELATIONS: A LACK OF COORDINATION?

We take as our starting point for this analysis the international legal framework, as the organizations we are engaging with in this analysis will be actors on the international stage in global health. The regulatory framework at the international level focuses upon the actions of states; international law is built around the concept of the state.[4] The original nature of international law as solely addressing sovereign states shifted in the twentieth century with the emergence and growth of, firstly international organizations, and later other varied actors beyond the state. Many initially considered institutions as being a part of a move towards an international 'community' that would contribute to providing a check on the authority of the state.[5] The growth of institutions was seen as positive as developing an increased capacity for the rule of law.[6] Franck, in this sense, famously claimed that international law had moved into a "post-ontological era" and into a mature legal system.[7]

In spite of these early hopes, however, the significant proliferation of institutions in the latter half of the twentieth century and into the twenty first century manifested in more of a challenge to the rule of law than a benefit.[8] The expansion was not simply in terms of number but also, more significantly, in terms of power and ability. A number of institutions can now be considered to exist as autonomous legal actors, operating beyond the control of their founding member states. In addition to this expansion, there has been a growth in the number and powers of numerous non-governmental organizations, as well as a greater involvement of business and other actors, such as philanthropic organizations. Nowhere is this more true that global health.[9]

This significant expansion and progress towards autonomy simply was not accompanied by sufficient development of the legal system to regulate these actions; the legal system Franck talked of has simply not developed into its 'mature' state. Not only do rules of international law continuing to depend upon states for their authority, but also, rules continue to be demarcated with regard to the particular kind of actor to which they are addressed. These actors, furthermore, continue to be either states or institutions, which are constituted by states.

The consequence is that in spite of some hopes within the twentieth century, institutions did not lead to an overall constitutionalized global order. This continues to be lacking. Most particularly, and the claim that is central to the present paper, there is a limitation in engaging in the interactions between international actors. Perhaps Franck's concept of a post-ontological system has been proven solely in relation to states, and more recently has developed in relation to institutions, but his focus on institutional autonomy is highly limited, as discussed below. Not only this, but it, furthermore, continues to lack in an overarching sense when considering numerous actors working together within the same legal space. The possession of the same legal space by multiple different varieties of actors is where a significant gap within the global legal order can now be tracked.

If a coherent system had been comprehensively established, under which these different actors functioned, the issues arising from coordination between actors would not be as pressing. There would exist a framework within which these relationships could be regulated. Rather than a constitutionalized system, however, there exists a pluralist system within which differing legal orders interact. The commonality between the majority of these legal orders is, furthermore, their continued focus on, or deference to, state sovereignty. Without first of all engaging in the difficulties and weaknesses of this overarching framework, the issues arising in the increasing collaborations between the new actors in global health cannot be fully understood.

It is the collaborations between actors at the global level generally, and in global health more specifically, that pose a substantial number of difficulties. The question arises

as to their relationship and the existence, or not, of a framework addressing these interactions. Institutions are often highly specialist, which has substantial benefits in their

ability to respond to different situations. There is a significant lack, however, of any sort of overarching legal framework to address the relationship between these entities. Some can be considered to have developed into autonomous legal systems of their own, such as the European Union.[10] Whereas others have a substantial role within the development and upholding of a particular area of international law; consider the role, for example, of the International Federation of the Red Cross and Red Crescent Societies and its role in International Humanitarian Law.[11] Each entity possesses its own remit and it is only if some sort of overarching international, or perhaps global, constitutionalized order could be identified that the interactions between the institutions and different legal norms and systems will gain clarity. Such an order does not exist, however. Rather than an overarching hierarchy of norms, the global system sees a pluralistic interaction of principles and actors. As Von Bogdandy has termed it, a "normative pluriversum".[12]

This lack of an overarching constitutionalized system really becomes exposed when considering the 2014-16 Ebola outbreak. Each institution and legal system had their individual role and remit to address the crisis, but the lack of coordination either created conflict between actors or left gaps in the ability of the global health community to adequately address the crisis. Responding organizations had to rely on ad hoc collaboration and discussions rather than there existing a clear framework within which they worked.

Not only is there a lack of an overarching global system, but furthermore even when limiting the focus to the law of international organizations (such as the UN and the WHO), and excluding other actors such as non-governmental organizations and states, the law remains unclear and underdeveloped regarding some of the fundamentals. For example, the primary source for determining the powers and structures of the institution is the constitution of the institution itself.[13] The discussion of what law applies to an international organization, if it is considered to have legal personality, has been a long and complex one. They are certainly able to be party to treaties[14], have more recently been argued to be subject to customary international law and general principles of international law,[15] although this remains controversial.[16] The discussion as to whether there may be the practice and development of a "common law" of international organizations[17], has not been straightforward. Relationships between international organizations, where not governed by treaties, are generally left to be dealt with by unspecified general principles, or in an ad hoc manner.

In the context of global health, there is often a pressing question or common concern that is driving the need for collaboration. It is usually the case that no single organization has the required resources to address the issue. In cases where there is a global health problem of significant magnitude such as a disaster or emergency (including Public Health Emergencies of International Concern as defined by the International Health Regulations) a variety of diverse organizations may come together voluntarily, despite the IHR only being binding upon state parties. It may be presumed that they are working towards a common goal, but tensions in the structure and purpose of organizations may lead to conflicts if there is no means of negotiating organizational differences. Indeed, it is the presumption of common goals that is the problem. We may be better off presuming conflict rather than presuming accord.

Table 1. Mission, Values and Policies of Global Health Actors

Organization	Mission	Vision/Goals	Values	Partnerships Statement	Accountability
World Health Organization	Our goal is to build a better, healthier future for people all over the world.	One of our core functions is to direct and coordinate international health work by promoting collaboration, mobilizing partnerships and galvanizing efforts of different health actors to respond to national and global health challenges.	Integrity: To behave in accordance with ethical principles, and act in good faith, intellectual honesty and fairness. Accountability: To take responsibility for one's actions, decisions and their consequences. Independence and impartiality: To conduct oneself with the interests of WHO only in view and under the sole authority of the Director-General, and to ensure that personal views and convictions do not compromise ethical principles, official duties or the interests of WHO. Respect: To respect the dignity, worth, equality, diversity and privacy of all persons. Professional Commitment: To demonstrate a high level of professionalism and loyalty to the Organization, its mandate and objectives.	WHO partners with countries, United Nations system, international organsations, civil society, foundations, academia, research institutions – with people and communities to improve their health and support their development.	World Health Assembly, U.N., Member States

Medicins Sans Frontieres	Médecins Sans Frontières provides assistance to populations in distress, to victims of natural or manmade disasters and to victims of armed conflict. They do so irrespective of race, religion, creed or political convictions.		Our actions are guided by medical ethics and the principles of neutrality and impartiality. We carry out our work with respect for the rules of medical ethics, in particular the duty to provide care without causing harm to individuals or groups. We respect patients' autonomy, patient confidentiality and their right to informed consent. We treat our patients with dignity, and with respect for their cultural and religious beliefs. In accordance with these principles, MSF endeavors to provide high quality medical care to all	Our decision to offer assistance in any country or crisis is based on an independent assessment of people's needs. We strive to ensure that we have the power to freely evaluate medical needs, to access populations without restriction and to directly control the aid we provide. Our independence is facilitated by our policy to allow only a marginal portion of our funds to come from governments and intergovernmental originations.	The highest authority of MSF International, the annual MSF International General Assembly (IGA) is made up of representatives of each association as well as of the individual membership, and the International President. The International President is elected by the IGA. Each representative, and the International President, has one independent vote on issues brought to the assembly for decision. MSF is committed to regularly evaluating the effects of its activities. We assume the responsibility of accounting for our actions to our patients and donors.
National Institutes of Health (note confusing number of mission	NIH's mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge		To exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science.	None	U.S. Congress

statements for each office)	to enhance health, lengthen life, and reduce illness and disability.				
Food and Drug Administration	FDA is responsible for protecting the public health by assuring the safety, efficacy and security of human and veterinary drugs, biological products, medical devices, our nation's food supply, cosmetics, and products that emit radiation.	Protecting consumers and enhancing public health by maximizing compliance of FDA regulated products and minimizing risk associated with those products.	Accountability We take personal responsibility for meeting individual, team , and organizational commitments. Commitment to Public Health We demonstrate our commitment to safeguarding the public health in our actions. We provide information that is accurate and clear, and in our interactions with others we actively listen to understand other points of view. Communication Diversity and Inclusion We embrace each individual's uniqueness and seek out their ideas and perspectives. We adhere to the highest ethical standards by consistently Integrity and Respect being honest and trustworthy in our actions. Quality We set high standards of excellence for	Collaborations and partnerships	U.S. Congress

			our work and take the necessary actions to continuously improve .		
Oxford University		The University of Oxford aims to lead the world in research and education. We seek to do this in ways which benefit society on a national and a global scale.	We will maintain the freedom for individuals and research groups to decide what to research.	To work effectively with other institutions and organizations, where such partnerships can lead to outstanding research and teaching We will seek to develop external collaborations, noting that these may be most effective in those areas where research and teaching strengths are complementary, while supporting connections between research groups at the level of individual projects.	Congregation and Council
Gates Foundation	Guided by the belief that every life has equal value, the Bill & Melinda Gates Foundation works to help all			Funder picks and chooses.	Board and trustees

	people lead healthy, productive lives. In developing countries, it focuses on improving people's health and giving them the chance to lift themselves out of hunger and extreme poverty. In the United States, it seeks to ensure that all people— especially those with the fewest resources— have access to the opportunities they need to succeed in school and life.				
Harvard University	None officially but states it wishes to be the preeminent academic institution in the world	Varies			By charter, Harvard has two governing boards— the President and Fellows of Harvard College (also known as the Corporation) and the Board of Overseers.

To make this clear, consider Table 1. It is not inconceivable to think of a situation where the WHO, MSF, Gates Foundation, NIH, FDA and universities such as Oxford and Harvard are brought together to collaborate. This table indicates the stated mission, vision, values, partnership policies, oaths and accountability structure (where such information was easily attainable). It is apparent that there will inevitably be conflicts between the missions of the organizations. For example, both Oxford and Harvard are competitive in their aspirations to be the world`s preeminent academic institution. The NIH seeks to advance fundamental knowledge in the area of health, whereas the FDA wishes to protect public safety in the United States by ensuring that medical treatments are safe and effective. MSF is pledged to come to the aid of populations in danger, and the WHO seeks to be the leader and standard setter in global health. Interestingly both the WHO and MSF have strong language regarding independence of action. The WHO has a pledge in its Code of Ethics and Professional Conduct obliging employees to "to discharge those functions and regulate my conduct with the interests of the WHO only in view". Therefore, it is imperative that this sort of *a priori* mission clash between organizations be acknowledged and managed expectantly.

Currently there is no governance instrument to guide representatives of organizations in their interactions with other organizations not otherwise specified in legal agreements. Holzscheiter comprehensively studied the nature of intergovernmental organizational behavior. Noting the extreme fragmentation characteristic of these relationships she discusses the need for norms in terms of what she has termed inter-organizational convergence:

The entire organizational convergence to global health governance as driven by norms or appropriate organizational behavior in the face of fragmentation allows moving away from a portrayal of global health as an apolitical technical domain and strategy to seeing its political and ideological dimensions.[18]

Understanding the political and ideological dimensions of inter-organizational relationships is an important move forward. Holzscheiter identifies what she calls moderate governance norms and principles that guide these relationships.[19] In terms of principles, she argues for the recognition of coherence, that is the congruity of the values, interests, actions and goals and harmonization of different values recognizing that different organizations may have incongruent visions and that the principles may in fact be in conflict.[20] However, the analysis that Holzscheiter provides focuses only on the elements of official intergovernmental inter-organizational cooperation, such as those between the WHO and the UN, and does not address issues related to different organizations of different types moving forward. There is good reason to believe as evidenced by Table 1, that the fragmentation and lack of convergence is even greater when taking into account the heterogeneous organizations involved in global health.

Aside from the divergent mission, vision and values that different organizations exemplify, it is important to acknowledge as per Holzscheiter, the political dimensions of inter-organizational behavior. It is evident that there are inherent power imbalances between different groups in the global health sphere. Organizations such as the Bill and Melinda Gates Foundation, the U.S. National Institutes of Health and the U.S. Food and Drug Administration exert differential financial and normative power in the market place of ideas and moral suasion. Organizations such as the World Health Organization should be neutral with respect to the interests of stakeholders in global health. MSF may pick and choose where they wish to engage. In essence, these organizations are not answerable in any straightforward substantive way to anyone but themselves, and most certainly not to each other - and yet we presume goodwill and accord when these organizations work together on a common mission.

THE CURRENT OPTIONS: INTER-AGENCY WORKING PROTOCOLS AND THEIR FAILURE

With no set framework or code within which institutions operate it is worth considering the ad hoc collaboration that currently takes place, as well as its effectiveness. This is generally done through inter-agency working protocols, which are often disparate in nature. The WHO signed a Letter of collaboration between the International Federation of Red Cross and Red Crescent Societies IFRC in 2005.[21] This agreement was reached on the basis of the two agencies "complementary approach to vulnerability to disease as a major cause of poverty" and the agencies commit, through the 2005 letter to: enhance contacts; build new relationships; support activities; and exchange technical contact points. The 2005 letter contains within it a stating that "the cooperation outlined in this letter will be valid for a period of 5 years from its date of signature", and does not appear to have been renewed. The WHO also entered into a Letter of Understanding with the International Medical Corps, in 2008.[22] The WHO-IMC LoU sets out that the parties intend "where possible and appropriate" to strengthen their collaboration regarding: surge emergency response; early recovery; capacity building. The cooperation included within this LoU is "to be reviewed every two years…until such time as it is terminated" - but does not appear to have been updated since 2008.

At a regional level the WHO Regional Office for Africa (WHO/AFRO) and the International Federation of the Red Cross and Red Crescent Societies signed a memorandum of understanding for collaboration in 2007.[23] The memorandum only mentions that the parties shall "act in close cooperation and consult with each other, not less than once a year, on matters of common interest…." No further information regarding what form this coordination ought to take is provided in the document.

The Basic Documents of the WHO also contain the "Principles governing relations between the WHO and NGOs",[24] which has a limited approach to NGOs for the WHO to partner with, which certainly does not reflect the cross-section of organizations involved in global health, included those that are operationally and normatively influential, such as MSF and Gates respectively. In order to be considered an NGO for the WHO to partner with the organization "must have a constitution or similar basic document, and established headquarters, a directing or governing body, an administrative structure at various levels of action, and authority to speak for its members through its organization representatives. Its members shall exercise voting rights in relation to its policies or actions"[25] Such criteria would rule out a number of operationally active organs such as MSF, as well as key actors in the above scenario such as universities engaging in research, the FDA, the Bill and Melinda Gates Foundation, and member state military bodies. The Principles do make allowances "in exceptional circumstances" for engagement with a national organization subject to the approval of the relevant WHO Regional-Director, and Member State in which the national organization is active,[26] but again, this demonstrates a limited framework for engagement with relevant actors during a public health emergency. Moreover, it is unclear if the "Principles governing relations between the WHO and NGOs" are even still operational or not, because, despite being included in the most recent version of the "WHO Basic Documents" attached the WHO Constitution, this document repeatedly refers to "the standing committee on Nongovernmental Organizations", which was abolished in 2016 by Resolution WHA69.10.[27]

In 2016 the WHA passed Resolution WHA69.10 "Framework of engagement with non-State actors" (FENSA), which abolished the Standing Committee on Nongovernmental Organizations, created a new pathway by which NGOs could partner with the WHO, and created the "Overarching Framework of Engagement with Non-State Actors" which serves as the guiding principles for WHO-external NGO relations. This document acknowledges

that "The global health landscape has become more complex in many respects; among other things, there has been an increase in the number of players including non-State actors" whilst protecting WHOs role as "the directing and coordinating authority in global health in line with its constitutional mandate". These relations are to "protect WHO from any undue influence, in particular on the processes in setting and applying policies, norms and standards; not compromise WHO's integrity, independence, credibility and reputation; be effectively managed, including by, where possible avoiding conflict of interest and other forms of risks to WHO; be conducted on the basis of transparency, openness, inclusiveness, accountability, integrity and mutual respect."[28]

This document is more expansive than the previous one which only considered NGOs, expanding the list of actors the WHO may engage with to include: private sector organizations; international business associations; philanthropic organizations; and academic institutions. It is positive that the WHO has expanded its principles of engagement to include highly influential bodies in the sector, that do not have one-member one-vote decision making protocols, such as MSF and the Gates Foundation. The participation envisaged by the Framework is largely driven towards participation in the decision making processes of the WHO (albeit without voting rights), although there is acknowledgement of technical collaboration refers to other collaboration, including: "product development; capacity-building; operational collaboration in emergencies; contributing to the implementation of WHO's policies." Prior to any engagement under this Framework the WHO conducts due diligence and a risk assessment on the relationship, and the collaboration "must be in the interest of WHO, and managed in accordance with the overarching framework and this policy to protect WHO, and in particular, its normative work, from any undue influence or conflict of interest and to ensure there is no interference with WHO's advisory function to Member States."

What engagement there is within this document that could be considered 'guiding principles' are all top-down in nature, designed to protect the WHO's identity and independence. There are provisions for due diligence as mentioned above, but also provisions for "monitoring and evaluation" of the relationship, which includes "non-compliance" with the Framework, which is monitored by the Secretariat. Non-compliance is taken to include: significant delays in the provision of information to the WHO register of non-State actors; provision of wrong information; use of the engagement with WHO for purposes other than protecting and promoting public health, such as for commercial, promotional, marketing and advertisement purposes; misuse of WHO's name and emblem; attempt at undue influence; and abuse of the privileges conferred by official relations. This list, whilst expansive, only includes the WHO monitoring the non-state actors it engages with, and does not acknowledge that non-compliance could happen on the part of the WHO too. Once again, the WHO considers itself to be an organization which holds others to account, not one which is held to account.[29] The Framework does, however, give significant leeway to the WHO during the scenario in which we envisaged above. In respect of implementation it states:

The Director-General, in the application of this framework, when responding to acute public health events described in the International Health Regulations (2005) or other emergencies with health consequences, will act according to the WHO Constitution and the principles identified in this framework. In doing so, the Director-General may exercise flexibility as might be needed in the application of the procedures of this framework in those responses, when he/she deems necessary, in accordance with WHO's responsibilities as health cluster lead, and the need to engage quickly and broadly with non-State actors for coordination, scale up and service delivery. The Director-General will inform Member States through appropriate means, including in particular written communication, without undue delay when such a response requires exercise of flexibility, and include summary

information with justification on the use of such flexibility in the annual report on engagement with non-State actors.[30]

FENSA has also been criticized for its ambiguous provisions with respect to engagement with industry. While acknowledging that FENSA is a step forward, Buse and Hawkes argue, FENSA is "a necessary but insufficient response to the significant part the private sector plays determining population health outcomes."[31] Balancing the scales would require a greater respect for public interest NGO's as partners rather than adversaries. This underscores the need for guidance in this sphere.

While all of this collaboration is positive in enabling a response to circumstances, it does not progress towards providing a long term solution and a reliable framework for addressing the institutional responses. It all demonstrates optional responses that institutions have chosen to engage with. This motivation may also arise for any number of reasons; the specific collaboration may not always be best designed to respond to the circumstances at hand. The ad hoc nature of the collaboration, furthermore poses a problem as there is a lack of consistency in response. With a lack of clarity on the relationships at play here, together with inconsistency in response, there also arise a number of questions on the consequences of actions and what happens when things go wrong.

Inter-institutional Collaboration and the Need for Accountability.

The increased collaboration between actors in global health not only causes complexity in terms of addressing who will act in any given situation, but it also raises questions for the consequences of those actions when things go wrong. The legal frameworks on accountability and responsibility are both built around specific actors, in particular states, and to a lesser degree international organizations. They are often, furthermore, predicated on the idea of being able to identify a single actor who has committed the harmful act.[32]

Accountability has a wide range of meanings but is generally understood to ensure the explanation and justification of actions.[33] Fundamental to notion of accountability are ideas of the appropriate exercise of power and the duty to account for the exercise of power. Accountability has, furthermore, long been accepted within liberal democratic systems as fundamental to the exercise of power.[34] One of the key elements of an accountability framework is that it is oriented to determining the outward or external obligations of organizations.[35] A key element of accountability is answerability, that is, how does an organization explain, justify and take responsibility for the consequences of its actions in the presence of external scrutiny.

The existence of accountability mechanisms provides a positive starting point in this area. However, these are often limited by the framework within which they have been created. When considering, for example, the WHO, a standalone accountability framework has existed for some time but the difficulties that arose with the Ebola crisis and the poor action, or inaction, demonstrated by the WHO show the inadequacies of this framework.[36] It has flaws in its simple application to the WHO's action, when considering the significant involvement of other agencies and actors within the Ebola situation, it was entirely inadequate.

This idea of answerability is central to the legitimation of international action. The concept of accountability responds to individual actors; the legal framework considers the accountability of states, or perhaps institutions, for their individual action. It does not necessarily consider the coordination of action and the possibility of collective action. This is one of the difficult aspects of accountability. Not only is the legal framework ill-equipped to deal with increased collaboration, but the lack of clarity in the interaction between these agencies can precipitate the need for accountability; a lack of coordination may lead to a gap in action or inappropriate action.

As noted, accountability theory, for the most part, relates to obligations of organizations and, in the context that we are discussing, organizations which engage in global health under a set of conditions where there is no clear instrument of legal accountability. However, the idea of answerability is one that plays a role that we believe can be adapted to further articulate a set of conditions for collaboration.

The specific form of accountability envisioned here is distinct from those proposed for a variety of other situations such as global public-private health partnerships (GHP). While GHP's are acknowledged governance mechanisms, systematic evaluation of their performance indicates salient gaps in performance, particularly with respect to ethical issues such as managing conflicts of interest or ensuring governance mechanisms to ensure transparency and inclusiveness in decision making.[37]

POSSIBLE SOLUTIONS

It is clear that the international legal framework in which international organizations and non-governmental organizations operate is not sufficiently able to ensure appropriate collaboration between such organizations in global health. This is largely due to the constitutional inadequacies of the international legal order, and the fact that such organizations exist in silos as standalone entities. The gap is conspicuous and as things currently stand there is little to prevent the type of situation that occurred during the 2014-2016 Ebola outbreak to occur again. Therefore, some form of governance document, representing "soft law" norms may be of benefit in the future. In what follows we will outline in broad strokes a possible way forward to manage and structure inter-organizational activities.

The current problem can only be addressed through a multitude of actions. While there may be arguments for an ability to continue as things stand, the status quo option is, if the above analysis has any purchase, untenable. While the ad hoc and fragmented nature of inter-organizational relations will no doubt serve the ends of particular organizations, it in no way serves a greater common good in global health. If no common good that transcends the particular mission of any organization necessitating the need for collaborative action exists, then the collaboration is moot. We hope that more than ritual interaction is called for in such circumstances.

Rather, we propose that some action needs to be taken to address this problem. Below we present three options, the adoption of any single one, or combination, would, we argue, make some progress towards improving the current issues. These options are:

Ethical Framework

An ethical framework may help to guide high level norms and expectations among organizations. An ethical framework may be of use in helping to articulate and mediate the competing values of organizations. Ethical frameworks are commonplace in global health. They have been employed by the WHO and other organizations in a variety of contexts such as public health surveillance, pandemic influenza planning, epidemic management and tuberculosis control.[38] Frameworks should be viewed as resources that aid in the understanding of ethical problems and in decision making. Frameworks have been proposed as a way of making complex landscapes tractable and to aid in the analysis of ethical issues and to guide reflection and decision-making. As global health organizations represent an immensely complex set of interactions, there is a need to include the multiplicity of perspectives required to be understood and balanced. Frameworks can be very useful because they attempt to capture what is relevant to the matter at hand. They help to simplify and make explicit factors relevant to a situation. However, they can also be problematic if they are applied blindly.

Code of Conduct

Codes of conduct have typically been structured to set expectations for members of organizations, in essence an "intra" rather than an "inter" organizational instrument. Codes of conduct have been defined as:

> *"Principles, values, standards, or rules of behavior that guide the decisions, procedures and systems of an organization in a way that (a) contributes to the welfare of its key stakeholders, and (b) respects the rights of all constituents affected by its operations."*

In the context of global governance, similar to the declaration of values, commonalities between codes of conduct can be determined. In this case the attention would be directed to the principles, values and standards of behavior that guide interactions between organizations. Again, our task is not to set out a comprehensive Code of Conduct for inter-organizational behavior, as we have no legitimate grounds to speak on behalf of organizations,

Accountability Framework

An accountability framework in this context would necessarily need to be set at the international level to encompass the actions of the various actors within it. The focus would need to be on providing a mechanism that would ensure answerability for both the internal and external obligations of the institutions concerned. This aspect is inextricably linked to those earlier mentioned solutions to this problem; in developing an accountability framework this could ensure the upholding of an ethical framework as well as a code of conduct. In drawing the other elements together, this aspect is central to ensuring a workable solution to this issue. It is difficult to conceive of a comprehensive approach within the limitations of the international system as it currently stands.[39] A full and comprehensively developed framework is beyond the scope of the current paper but ensuring frameworks of accountability, both internal and external to the organization would be the ideal scenario. An internal framework would specify obligations and would designate roles within the organization for checking whether the organization is meeting these aims sufficiently. The ideal vision of an external framework would include an independent mechanism to ensure scrutiny of action of the organization in terms of its compliance with its internal, and its international obligations. It could also be utilized in combination with either option one or two in ensuring compliance with an ethical framework or a code of conduct. The creation of such a mechanism would not be without its difficulties but it would show the gold standard in ensuring accountable institutional actions.

From the above, it seems that there are a minimal set of desired steps that should be carried out in the context of inter-organizational collaboration in global health.

The first step would be the comparative analysis of the values of the organizations involved including clear articulation of the values and an analysis of their convergence and divergence. Included in this is the articulation and sharing of organizational priorities that motivate the need to collaborate in the first place. A general statement of mutual respect could be developed to indicate good will between organizations. An agreed upon decision making framework that aspires to transparency and the reduction of power imbalances within the collaboration should be articulated. Finally, an accountability framework which specifies the obligations of each organization to each other should be created to respond to the answerability criterion. Ideally, such answerability would entail some form of public reporting. It would be important to include a high order statement or collective pledge to

the solution of the problem over optimizing organizational imperatives. The designation of a lead organization to coordinate the activities would be desirable.

A minimal requirement is that organizations be explicit about their espoused values and that some time and effort be devoted to articulating and examining the convergence and divergence of these values prior to collaboration or interaction. This may seem a lofty ambition in the context of an emergency, but there seems be a core set of organizations and organizational phenotypes that regularly interact in global health. It would seem evident that this kind of exercise is imminently sensible and feasible providing there is political will. Determining the key agreed upon values that are agreed upon sets up the opportunity to manage difference proactively.

CONCLUSION

In this paper we have identified a problematic set of gaps in global governance that require urgent attention. The West African Ebola outbreak exposed current deficits with respect to governance. We have identified some avenues that could possibly mitigate some of the current problems. We invite organizations involved in global health to take up the challenge of improving global health by improving inter-organization practice.

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Commentary:
The Antimicrobial Resistance Fight, Like Trade, Should be Multilateral

Kermit L. Jones and Payal K. Patel

In 1847, the Hungarian physician Ignaz Semmelweis determined that reasonable hand sanitation measures dramatically decreased infectious disease[1] transmission and death in a European maternity ward. His discovery was so well received that not long after, he was fired and committed to a mental asylum. There, as irony would have it, he died of likely infectious disease-related sepsis. One hundred and seventy years later, people still die unnecessarily from lack of proper and simple public health measures such as handwashing; rather now, their deaths are due to increasingly resistant antimicrobials, and not in a single maternity ward, but all over the world.

Declaring it a "crisis we cannot ignore," in September 2016, all 193 Member States of the United Nations General Assembly pledged to take action against the threat of rising antimicrobial resistance (AMR). Recently, the UK government launched a £10 million research competition[2] for innovations combating AMR. On this side of the Atlantic, over the past two years, the CDC has used several million dollars in Congressionally appropriated funds to launch an initiative[3] focused on strengthening lab networks, sequencing bacteria genomes and containing novel resistance threats. While these are powerful first steps, we argue that to date, too little concerted action has been done to combat the resistance catastrophe that many infectious disease experts predict is just over the horizon[4]. We propose a shift away from individual initiatives and a focus on combined action to: (i) scale currently effective containment strategies beyond high income countries and to global transit hubs and densely populated regions where they are most needed; and (ii) use high level diplomatic efforts to facilitate the creation of assistant secretary and junior level minister positions within member states focused exclusively on antimicrobial resistance. Only multilateral moves such as these will bring the level of operational expertise needed to effectively address this problem before it is too late.

The Urgency of Now

Throughout history, infectious disease makes notable mentions in historic and religious texts. For example, passages referencing leprosy, communicable skin diseases and worm infections can be found in the Torah (e.g., Leviticus 13:1), Egyptian medical papyri[5], and the Vedas[6]. In Dr. Semmelweis's time, the scientific community was unaware that bacteria, viruses, parasites and fungi were the culprits behind many diseases that caused high child and maternal mortalities and killed millions. Fast forward to the twentieth century and Alexander Fleming would change the world with the discovery of penicillin. By then, the late 1920s, it was quite evident and sobering how deadly microbes were: between 1918-1919, fifty million people, or nearly three times the number of people killed in World War I, died from the Spanish Flu[7].

Yet, since Dr. Fleming's momentous discovery, the bacteria he treated with penicillin, *Staphylococcus aureus*, along with many others, have become increasingly resistant to antibiotics to which they were once highly susceptible. Fleming himself famously warned[8] during his 1945 Nobel Prize acceptance speech of the dangers of microbial resistance long before antibiotics were being used to bulk up farm animals[9], in over-the-counter antibacterial soaps[10], and without prescription in countries like Spain[11]. Decades of such misuse has resulted in once easily treatable diseases becoming resistant to first and second line treatments. For example, the sexually transmitted disease gonorrhea, once easy to eradicate, has, in some places, become resistant to nearly all[12] treatment options.

OPENING A NEW FRONT

Currently, governments, funding organizations and private sector entities employ a combination of strategies that involve containing the spread of infection and push and pull incentives such as tax credits and market exclusivity extensions to encourage new drug development. Such strategies often include targeted campaigns, like the Global Handwashing Partnership, of infection prevention and control, and operationalizing antimicrobial stewardship programs—teams of infectious disease physicians and pharmacists that provide healthcare workers with advice and evidence-based guidelines to optimize antimicrobial use. These programs have become so effective in decreasing infectious disease spread that the U.S. Centers for Medicare and Medicaid Services (CMMS) has proposed[13] mandating their use in all healthcare facilities that receive CMMS reimbursements, something the state of California and the Joint Commission have already done[14].

We propose building on the declaration made during the 2016 United Nations General Assembly meeting and going beyond these current government-level efforts to combat antimicrobial resistance. We suggest that governments use the goodwill of that unanimous declaration to develop strategies to broad global effort to detect, isolate, contain and impede antimicrobial resistance. A vital part of this strategy would be working with the governments of global transit hub cities such as Jakarta, New York, Paris, Dubai, Tokyo, and others, where the volume of international airport traffic could allow resistant microbes to spread rapidly and uncontrollably. Countries could use the United Nations as a forum by which they can design assistant secretary or junior minister positions at the Senior Executive Service ("SES") levels of their health departments, Ministries of Health (MOH) and Departments of Defense. These SES level government officials could then work together to develop multilateral strategies that combat antimicrobial resistance while also addressing member states' health-related national security concerns. While an international coalition of governments working across countries and continents is a great place to start, a comprehensive global strategy against AMR will take more than just the private sector going it alone.

Under the umbrella of a United Nations mandate, the U.S., through the United States Agency for International Development (USAID), could work with other government aid agencies such as the UK's Department for International Development (DFID) and the European Union's International Cooperation and Development (ICD) to scale highly effective containment strategies like healthcare worker hand sanitization, decolonization of high bacteria patient areas[15] (e.g., hands, perineal, and axilla areas) and decontamination of patient spaces. Governments seeking to stay ahead of AMR will also need non-governmental organizations ("NGO") like the Gates, Ford and Rockefeller Foundations, corporations and other private sector actors to join the fight. One example of how these organizations can incentivize behavior in the countries in which they work is to require AMR prevention and containment training programs as either a pre-, or co-requisite for other program funding, where relevant. Countries that may not otherwise be able to fully fund such training programs through payroll or other taxes could raise revenue through taxing any tobacco-based products. This would have the two-fold effect of raising funds for AMR programs as well as decreasing global tobacco consumption[16], which weakens the immune system[17], raises the risk of infection and globally, is the leading cause of preventable death[18] in the world.

CONCLUSION

Microbes were here before humans and are likely here to stay. Two years ago, the United Nations member states made a momentous and historic pledge to collectively combat Antimicrobial Resistance. We contend, however, that other concrete steps must now be taken to continue the momentum toward a sound, effective and sustainable antimicrobial

agenda. These steps include the U.S. and Europe not only focusing its resources at home, but also partnering with developing countries to scale what works, concentrate resources around transit hubs and create a network of high level collaborators to combat AMR in every region of the world. If we don't act now, one day soon, we will be all out of successful treatments to offer patients, and all we'll have to offer them are stories of the past and articles, like the one we just wrote.

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