FORGING AHEAD: THE INCLUSION OF GLOBAL HEALTH IN THE TRAINING AND DEVELOPMENT OF ENVIRONMENTAL SCIENCE AND ENGINEERING OFFICERS

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Global health is a national security imperative. Preparedness for future challenges requires foresight in the training and development of leaders, who must be ready to meet the ambiguity and complexity of the modern global environment. A 2020 study found that 68% of Environmental Science and Engineering Officers (ESEOs) conducted global health activities between 2008-2020, with 54% of ESEOs applying competencies specific to water, sanitation, and hygiene during their engagements with host or partner nations. These activities have been informal additions to their force health protection roles and responsibilities. The cross-sectional, mixed-methods study provides quantitative and qualitative evidence to support the formal inclusion of global health in the training and development of junior ESEOs. Interviews from 17 ESEOs (O-5) specified actions that should be taken to facilitate the inclusion of global health-related competencies, attributes, skills, and topics into junior ESEO training and development efforts. Perhaps there is no more resounding call to action than the ongoing COVID-19 global pandemic, which demonstrates that such threats and their burdens are interconnected across all domains in the system of health.

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

FORGING AHEAD: THE INCLUSION OF GLOBAL HEALTH IN THE TRAINING AND DEVELOPMENT OF ENVIRONMENTAL SCIENCE AND ENGINEERING OFFICERS, by Christine Argueza-Prince, 109 pages.

Global health is a national security imperative. Preparedness for future challenges requires foresight in the training and development of leaders, who must be ready to meet the ambiguity and complexity of the modern global environment. A 2020 study found that 68% of Environmental Science and Engineering Officers (ESEOs) conducted global health activities between 2008-2020, with 54% of ESEOs applying competencies specific to water, sanitation, and hygiene during their engagements with host or partner nations. These activities have been informal additions to their force health protection roles and responsibilities. The cross-sectional, mixed-methods study provides quantitative and qualitative evidence to support the formal inclusion of global health in the training and development of junior ESEOs. Interviews from 17 ESEOs (O-5) specified actions that should be taken to facilitate the inclusion of global health-related competencies, attributes, skills, and topics into junior ESEO training and development efforts. Perhaps there is no more resounding call to action than the ongoing COVID-19 global pandemic, which demonstrates that such threats and their burdens are interconnected across all domains in the system of health.

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> There are mountains growing beneath our feet that cannot be contained. All we've endured has prepared us for this. Bring your hammers and fists. We have a glass ceiling to shatter.
>
> –Rupi Kaur

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ACRONYMS

2LT	U.S. Army 2nd Lieutenant
AMEDD	Army Medical Department
AOC	Area of Concentration
CEPH	Council on Education for Public Health
CUGH	Consortium of Universities for Global Health
CI	Confidence Interval
CPT	U.S. Army Captain
DODI	Department of Defense Instruction
DNBI	Disease and Non-Battle Injury
DOD	Department of Defense
ESEO	Environmental Science and Engineering Officer
EVD	Ebola Virus Disease
FHP	Force Health Protection
GHA	Global Health Activity
GHE	Global Health Engagement
GHECTK	Global Health Education Competencies Toolkit (2nd Edition)
LTC	U.S. Army Lieutenant Colonel
MAJ	U.S. Army Major
MDO	Multi-Domain Operations
MEDCAP	Medical Civil Assistance Program
MHS	Military Health System
MIL-CIV	Military-to-Civilian

MIL-MIL	Military-to-Military
NGO	Non-Governmental Organization
SECDEF	Secretary of Defense
USAID	U.S. Agency for International Development
WaSH	Water, Sanitation, and Hygiene
WHO	The World Health Organization

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CHAPTER 1

INTRODUCTION

> The creativity and talent of the department is our deepest wellspring of strength, and one that warrants greater investment.
>
> —Secretary of Defense James N. Mattis,
> "DOD Press Briefing Remarks on the 2018 National Defense Strategy"

Background

The Military Health System's (MHS) principal mission is to maintain a medically ready force and support the Department of Defense's (DOD) system-wide preparedness for full-spectrum military operations. The mission is accomplished through a diverse set of activities, comprised of an integrated, combat-ready system that supports battlefield medical requirements, worldwide healthcare delivery, management of medical research and development programs, and public health services for military communities and deployed populations.[1] When the DOD Instruction (DODI) 6000.16, Military Health Support to Stability Operations, outlined the requirements to meet the increasing demands for medical stability operations, significant shortcomings of the MHS were exposed.[2]

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[1] Assistant Secretary of Defense for Health Affairs (OASDHA), "Overview of the Department of Defense's Military Health System," (Fact Sheet, OASDHA, Falls Church, VA), accessed January 22, 2021, https://archive.defense.gov/home/features/2014/0614_healthreview/docs/Fact_Sheet_Overview.PDF.

[2] Derek Licina, Brad Cogswell, and Richard Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority: Supporting Theater Security Cooperation Objectives and Generating Military Medical Readiness," *Military Medicine* 181, no. 11 (2016): 1397-1398.

A document of change request (DCR) generated by the Office of the Secretary of Defense for Health Affairs identified gaps across the MHS. With the DOD's new Strategic Guidance in mind, the DCR found extensive deficiencies, particularly in the preparedness of MHS personnel for the civilian-military operational environment in foreign and domestic settings. The lack of mid- to senior-level experts impeded the MHS's effectiveness in supporting the DOD's contingency operations. Exploring the issues further, the DCR determined that the MHS's support of stability operations was predicated on partnering and collaborating with U.S. Government (USG) organizations and active liaising between the MHS, international, and interagency stakeholders.[3] Across all public health-related disciplines in Army Medicine, *global health* is the only systems-focused discipline that can fully encompass the extent of today's range of military operations (ROMO) and the interdisciplinary, interagency, and international context of Service-specific, Joint, and multinational operations.

In the Army, Environmental Science and Engineering Officers (ESEOs) are one of the only professions uniquely trained in public health through an Army Medical Department (AMEDD) functional course.[4] With their diversity of operational experiences, ESEOs are primed to fill the global public health gaps across the Joint Force in the short term. In the last two decades, ESEOs have employed a broad array of public health competencies to prevent disease and non-battle injuries (DNBI) across the ROMO. Their training and expertise span environmental health, epidemiology, industrial hygiene,

[3] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority, 1397-1398.

[4] 6A-F5, Principles of Preventive Medicine Course.

environmental engineering, entomology, risk assessment and management, and other public health disciplines. Their success in their primary mission set of *force health protection* (FHP) is evidenced by the low DNBI rates among deployed troops. ESEOs' operational impacts beyond servicemember-focused FHP, however, are even more notable.

As the counterinsurgency (COIN) strategy predominated multiple campaigns and operations in the Middle East, Africa, and Southeast Asia, ESEOs adapted their technical skills to irregular warfare in austere conditions. Tactical level ESEOs applied competencies used in conventional FHP to support Joint initiatives, military-to-military (Mil-Mil) partnerships, and multinational coalitions. They enabled Special Operations Forces (SOF) missions in Operation Enduring Freedom (OEF)-Afghanistan, OEF-Philippines, and Combined Joint Task Force-Horn of Africa, by providing direct public health services to SOF teams embedded in insurgent-controlled or -contested villages. ESEOs were instrumental during humanitarian assistance and disaster response missions like the 2005 Pakistan earthquake. Throughout Operation Iraqi Freedom (OIF) and OEF, ESEOs facilitated the provision of essential services (e.g., clean water, food, and waste removal) during stability operations.[5]

ESEOs' contributions at the tactical and operational levels enabled the Joint Force's achievement of strategic goals. These contributions also demonstrate their critical yet informal practice of global health in complex operating environments. The MHS is

[5] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398.

gradually evolving to meet the challenges of a multi-domain[6] and globalized operating environment, while also aligning its efforts in accordance with DODI 6000.16. ESEOs have a distinct opportunity to lead the charge in global health practice, by leveraging their battlefield-tested professional competencies and operational experiences in the last two decades.[7]

Problem Statement

One of the primary responsibilities of ESEOs is FHP through the prevention of DNBIs in the area of water, sanitation, and hygiene (WaSH). A 2020 research study found that 68% of ESEOs in the ranks of 2nd Lieutenant (2LT) to Major (MAJ) have participated in global health activities (GHAs) overseas. Fifty-eight percent of those surveyed conducted these activities using WaSH-specific competencies. Inquiry into the prevalence of WaSH activities from 2008-2020 showed an upward trend in the last four years, with lieutenants having the highest odds of partaking in GHAs. Global health is not acknowledged as a formal discipline of practice during the training and development of ESEOs. The execution of GHAs is not recognized as a critical task or responsibility of

[6] The *multi-domain* concept refers to the Army's future challenge in a new era of great power competition. Adversaries are anticipated to achieve their aims through a stand-off in the political, military, and economic realms by leveraging multiple, simultaneous, or synchronized strategies across the domains of land, sea, air, space, and cyberspace.

[7] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398.

ESEOs in forward operations, despite using their WaSH competencies in GHAs, which they are evidenced to support.[8]

Purpose of Study

The study aims to provide quantitative and qualitative evidence to support the formal inclusion of global health in the academic training and professional development of ESEOs.

[8] Christine Argueza-Prince, "WaSH in Practice: Evidence and Themes from the Global Health Activities of Environmental Science and Engineering Officers," (Master's thesis, University of North Carolina Chapel Hill, 2020), 37-40, University Libraries Digital Repository.

Research Questions

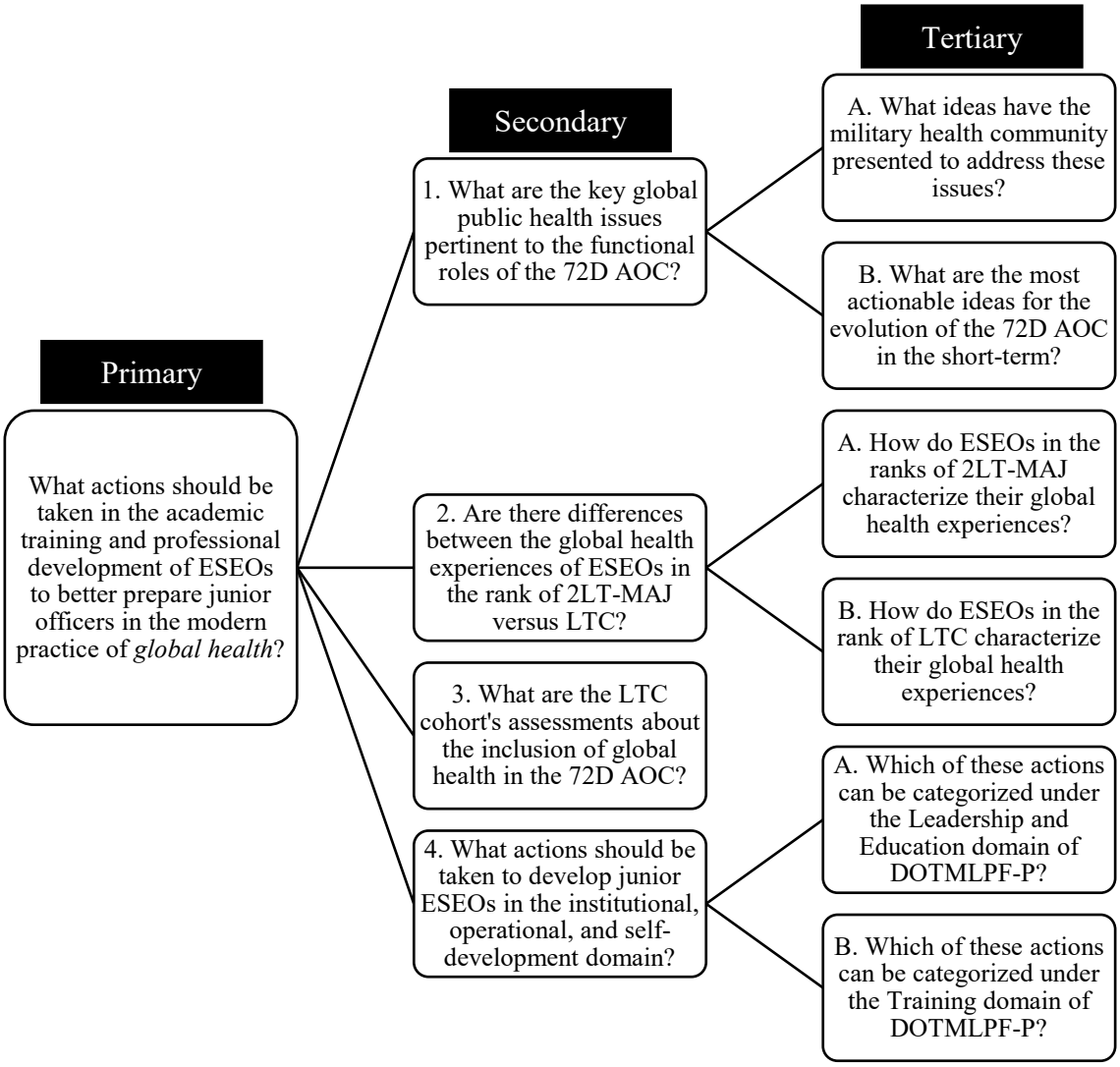

Figure 1. Conceptual Visualization of Secondary and Tertiary Questions Nested within the Primary Research Question of the Study

Source: Created by author.

Definition of Terms

Area of Concentration (AOC): refers to the occupational specialty categorized under one of the four medical functional areas (MFA). The 72D AOC (Environmental Science and Engineering) is categorized under MFA 72,[9] Preventive Medicine Sciences.

Disease and non-battle injuries (DNBI): leading causes of morbidity during wars and military operations. Throughout U.S. military history, DNBIs have produced more casualties, hospitalizations, and time lost than battle injuries as a result of the hostile combat environment.[10]

Force Health Protection (FHP): defined as the prevention of disease and non-battle injuries to protect the strength and capabilities of the military population.[11]

Global health: described as the modern derivative of *international health*.[12] Global health is inherently interdisciplinary, and its practice spans the factors and

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[9] U.S. Army Medical Service Corps, "U.S. Army Medical Department (AMEDD)," U.S. Army, accessed March 3, 2020, https://medicalservicecorps.amedd.army.mil/careers.html#72D.

[10] Philip J. Belmont Jr., Gens P. Goodman, Brian Waterman, Kent DeZee, Rob Burks, and Brett D. Owens, "Disease and Nonbattle Injuries Sustained by a U.S. Army Brigade Combat Team During Operation Iraqi Freedom," *Military Medicine* 175, no. 7 (July 2010): 469-476, 10.7205/milmed-d-10-00041; Barbara E. Wojcik, Rebecca J. Humphrey, Bogdan Czejdo, and Harrison Hassell, "U.S. Army Disease and Nonbattle Injury Model, Refined in Afghanistan and Iraq," *Military Medicine* 173, no. 9 (2008): 825-835.

[11] Mary Brueggemeyer, "Force Health Protection," in *Fundamentals of Military Medicine*, by Francis G. O'Connor, Eric B. Schoomaker, and Dale C. Smith (Fort Sam Houston: Borden Institute, Office of the Surgeon General, U.S. Army Medical Center of Excellence, 2019), 234.

[12] Jeffrey P. Koplan, Christopher T. Bond, Michael H. Merson, Srinath K. Reddy, Mario Henry Rodriguez, Nelson K. Sewankambo, and Judith N. Wasserheit, "Towards a Common Definition of Global Health," *The Lancet* 373, no. 9676 (2009): 1993-1995.

determinants that impact an entire system of health. There is currently no consensus on its definition in the academic and military public health communities. Broadly, global health encompasses all that is necessary to sustain human security, including people's universal rights, personal protection, the rule of law, access to food, water, healthcare, education, basic infrastructure, and shelter.[13] Licina differentiates the discipline of global health from the healthcare sector, positing that the synergistic effect of multiple sectors serves as the determinants of health. He adds that the healthcare sector is the gatekeeper of health, but sectors like education, the environment, and security, produce it.[14]

Global health activities: DODI 2000.30 specifies *global health engagements* (GHEs) as the formal term for Mil-Mil and Mil-Civ engagement activities supporting Joint and civil-military operations per Joint Publication (JP) 3-0 and JP 3-57.[15] However, the DODI's definition of GHE does not capture the gamut of activities pertinent to the ESEOs' practice of global health. Thus, for the purposes of this research, the term *global health activity* rather than *global health engagement* is used to capture the full extent of ESEOs' overseas activities with host and partner nations in the specific area of water, sanitation, and hygiene, see Limitations and Delimitations.

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[13] Lawrence Gostin, "Global Health," in *Global Health Law* (London: Harvard University Press, 2014), 22, 61-68.

[14] Derek Licina, "The Military Sector's Role in Global Health: Historical Context and Future Direction," *Global Health Governance* 6, (2012): 1-30.

[15] Office of the Under Secretary of Defense for Policy, Department of Defense Instruction (DODI) 2000.30, *Global Health Engagement (GHE) Activities* (Washington DC: DOD, July 2017).

Global health diplomacy: the intersection of public health and foreign affairs, referring to establishing relationships with multilateral organizations, foreign governments, and ministries of health to work towards the protection and promotion of health worldwide.[16]

Military-to-civilian health (Mil-Civ) engagements: refer to engagements where military personnel collaborate or partner with civilian (non-military) entities, including local civilian health clinics or community health workers.[17]

Military-to-military (Mil-Mil) health engagements: the exchange of knowledge and expertise between functional counterparts of two or more nations' militaries.[18]

Smart power: the combination of hard power (use of force) and soft power; "winning hearts and minds."[19]

Socioecological Model (also referred to as the *Socioecological Model Framework*): consists of overlapping and reinforcing levels in a system. Each level includes activities and potential modes of intervention relevant to the specific conditions

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[16] Office of Global Affairs, "Global Health Diplomacy," U.S. Department of Health and Human Services, accessed April 22, 2021, https://www.hhs.gov/about/agencies/oga/global-health-diplomacy/index.html.

[17] Thomas R. Cullison, Charles W. Beadling, and Elizabeth Erickson, "Global Health Engagement: A Military Medicine Core Competency," *Joint Force Quarterly*, 80, no. 1 (2016): 54-61, https://ndupress.ndu.edu/JFQ/Joint-Force-Quarterly-80/Article/643102/global-health-engagement-a-military-medicine-core-competency/.

[18] Edwin K. Burkett and Gerald V. Quinnan Jr., "Global Health and the U.S. Department of Defense: A Call for an Evidence Base," *Military Medicine* 180, no. 11 (2015): 1114-1115.

[19] Doug Gavel, "Analysis and Opinions: Joseph Nye on Smart Power," Harvard Kennedy School Belfer Center, July 3, 2008, https://www.belfercenter.org/publication/joseph-nye-smart-power.

and stakeholders of that level, much like a systems framework. The *Intrapersonal* level includes the knowledge or education of the target population, their perceptions, behaviors, and self-efficacy. The *Interpersonal* level includes the influence, behavior, and attitudes of social networks and the make-up of social networks in a population. The *Institution* level includes the perception and attitudes of leaders, institutional culture, institutional policies, institutional physical environment, and institutional capacity. The *Community* level consists of the delivery of community services and the community's physical environment and capacity. The *Policy* level includes the capacity for public advocacy, social norms, perceptions and attitudes of policy makers, and the creation and enforcement of public policy.[20]

Stability operations: These operations are executed in several forms across the ROMO. During peacetime, stability operations can include routine contact, military presence, and security cooperation activities. During crisis response and limited contingency operations, the balance of stability and combat operations vary widely. In differing contexts, foreign humanitarian assistance, COIN, and other stability actions are used. In general, stabilization is the responsibility of the host nation, Department of State,

[20] Shelley Golden and Jo Anne Earp, "Social Ecological Approaches to Individuals and Their Contexts: Twenty Years of Health Education and Behavior Health Promotion Interventions," *Health Education and Behavior* 39, no. 3 (2012): 364-372; Violence Prevention, "The Social-Ecological Model," Centers for Disease Control and Prevention, accessed April 26, 2021, https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html.

and the U.S. Agency for International Development, with support from the DOD conducting stability actions as necessary.[21]

Systems-thinking: a cognitive organization of the confluence of trends that are utilized in a variety of disciplines, including military science, public health, and engineering. The following fundamentals of a systems-thinking approach are shared across disciplines.[22]

1. Amplified attention to new knowledge, how it is gained, managed, exchanged, interpreted, integrated, and disseminated within and across disciplines
2. Encouragement of networks, building cross-organizational, individual, and interdisciplinary, relationship-building to achieve shared goals and objectives
3. Development and use of models and projections to improve strategic decision-making
4. Fostering an arrangement that allows organizations and their functions to work together in a system

Whole-of-government: an approach to a shared vision via inter- and/or intra-agency cooperation. The intent is to strengthen the ability of multiple organizations to operate as one system rather than a collection of separate components. It establishes a

[21] Chairman of the Joint Chiefs of Staff (CJCS), Joint Publication (JP) 3-07, *Stability* (Washington, DC: JCS, August 2016).

[22] Scott J. Leischow, Allan Best, William M. Trochim, Pamela I. Clark, Richard S. Gallagher, Stephen E. Marcus, and Eva Matthews, "Systems Thinking to Improve the Public's Health," *American Journal of Preventive Medicine* 35, no. 2 (2008): 196-203.

unified effort between government agencies to maximize resources, including personnel, funding, equipment, and supplies.[23]

Whole-of-society approach: differs from the *whole-of-government* approach as it includes stakeholders from international agencies, states, for-profits, and community organizations. Decision-making is not centered solely on the interests of state-connected stakeholders. Rather, individual and collective actors from governments, markets, and civil society, across all levels (e.g., global, national, regional) and domains (e.g., health, agriculture, information technology) create institutional arrangements based on their diverse expertise and perspectives, developing systems-wide solutions overtime.[24]

Scope

The study evaluated actionable ideas related to the academic training and professional development of junior ESEOs to better them for the modern practice of global health. Analysis included primary and secondary data, peer-reviewed literature, and results of a recent technical report on ESEO GHAs. While the literature review encompasses all categories of the Doctrine, Organization, Training, Leadership and Education, Personnel, and Policy (DOTMLPF-P) domains, the research itself focused on

[23] Elizabeth Jarrett, "Whole-of-Government Approach: What it Means and How it Translates to Improving National Health Security," *National Health Security Strategy* (blog), *U.S. Department of Health and Human Services,* February 6, 2019, https://www.phe.gov/ASPRBlog/Lists/Posts/Post.aspx?ID=329.

[24] Nii Addy, Alain Poirier, Chantal Blouin, Nick Drager, and Laurette Dube, "Whole-of-Society Approach for Public Health Policymaking: A Case Study of Polycentric Governance from Quebec, Canada," *Annals of the New York Academy of Sciences* 1331, no. 1 (2014): 216-229, 10.1111/nyas.12503.

the aspects of Training and Leadership and Education that pertain to the range of duties performed by the ESEO.

Limitations and Delimitations

Participation in the study was voluntary. The February 2021 67C roster published by the 72D Consultant's Office was utilized to identify and reach all potential participants. The sample population only included Active Duty ESEOs. Recruitment of the sample population was limited by the currency of contact information on the roster, time zone differences, and the available modes of contacting potential participants. The classification level of their activities limited the range of experiences shared by the study participants. The study only collected Unclassified data on the ESEOs' official activities and experiences; therefore, the results and interpretations are only generalizable to Unclassified activities in global health.

The term *global health activities* were used to describe the experiences of ESEOs in their practice of the global health discipline in an overseas setting. DODI 2000.30 specifies *global health engagements* as the formal term for Mil-Mil and Mil-Civ engagement activities in support of Joint and civil-military operations per JP 3-0 and JP 3-57. GHEs are defined as interactions:

> between individuals or elements of the DOD and those of a partner nation's armed forces or civilian authorities, in coordination with other USG departments and agencies, to build trust and confidence, share information, coordinate mutual activities, maintain influence, and achieve interoperability in health-related activities that support U.S. national security policy and military strategy . . . GHE activities establish, reconstitute, maintain, or improve the capabilities or capacities of the partner nation's military, civilian health sector, or its Ministry of Defense,

Ministry of Health, and/or appropriate partner nation ministry or agency in order to achieve USG national security objectives and DOD strategic objectives.[25]

However, DODI 2000.30 does not capture all activities pertinent to the practice of global health as a discipline. Most ESEOs' activities in the global health space have been informal in nature. Namely, the GHAs of company-grade ESEOs were informal additions to their FHP duties at the tactical level. Activities were generally not conducted per DODI 2000.30, nor were they aligned with GHE funding streams.[26] To effectively capture ESEOs' practice of global health competencies, the study did not limit data collection to the scope of GHE terminology per DODI 2000.30. Participants were asked to share all health-related missions where they interacted with foreign military, organizations, or populations within the specified timeframe. To mitigate recall bias, assessment of experiences was limited to those conducted between 2008 and 2020. The principal investigator developed the questions, performed the telephonic interviews, and conducted all aspects of data analysis. The memoing and coding techniques used for the qualitative methods may have been limited by having only one individual analyzing the narratives.

Significance of the Study

In May 2020, the first technical report focusing on ESEOs' relevance in the global health space was published. The report conveyed that while junior ESEOs perceived

[25] Office of the Under Secretary of Defense for Policy, DODI 2000.30.

[26] Argueza-Prince, "WaSH in Practice," 13, 20; Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398.

themselves as having achieved mission success in their WaSH-related GHAs, they identified extensive gaps in their global health competencies.[27] The current study further explores the significance of the technical report's conclusions, to determine whether the experiences of senior leaders in the global health space align with the reported experiences of junior ESEOs. The study aims to serve as a quantitative and qualitative evidence base to support the transformation of the 72D AOC. DOTMLPF-P analysis was used to assess the inclusion of global health in the formal roles and responsibilities of the ESEO, to ascertain what actions need to be taken in the Training and Leadership and Education domains to facilitate the modern practice of global health among junior ESEOs.

[27] Argueza-Prince, "WaSH in Practice," 44-45.

CHAPTER 2

LITERATURE REVIEW

Introduction

The scoping literature review discusses the relevance of global health to the DOD and 72D AOC to date. While GHAs have been utilized as formal and informal components of military missions, some existing literature question the use of military assets for non-combat purposes and the (lack of) evidence to support the effectiveness of these activities in the short and long term. To determine how ESEOs' global health practice can be optimized to meet future challenges, DOTMLPF-P is applied to categorize and synthesize overarching recommendations from peer-reviewed commentary by global health experts in the military medical community.

Relevance of Global Health to the DOD

The precedence for using global health as a tool to support the U.S.' defense strategies is not novel. During the Vietnam War, stability operations became a principal mission of the U.S. Army. Priorities shifted from kinetic war missions to preventing insurgency. The transition was tied to a fundamental problem that most emerging nations shared. The linkage between a population-wide deprivation of essential health services and socioeconomic and health inequities were established as the determinants of poor health outcomes and the roots of civil unrest. To this day, these deprivations and inequities continue to leave populations susceptible to insurgency. The emphasis on

preventing insurgencies paved the way for the Army Medical Service and its contributions to the DOD's stability operations.[28]

Health is the universal language that transcends borders and culture. The DOD employs health activities to project power, communicate with populations, and influence power dynamics.[29] The Army and other services mobilize medical assets in regions where natural or man-made disasters occur or when insecurity and instability are rampant. These operations intertwine the military's humanitarian traditions with the implicit intent of maintaining apolitical lines of communication between nations.[30] The DOD leverages a broad range of professional skill sets to execute health-related activities for the purposes of fostering international relationships.[31] These nation-to-nation events address issues of global health importance while supporting the strategic posture and foreign policy of the U.S.[32]

The relevance of global health is not limited to the projection of military power and influence in the traditional sense. Nang and Martin posit that g*lobal health* is a pillar of the U.S.'s security agenda and is a necessary investment into the preparedness for the

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[28] Spurgeon Neel, "The Medical Role in Army Stability Operations," *Military Medicine* 132, no. 8 (1967): 605-608.

[29] Ibid.

[30] Gerald V. Quinnan Jr., "The Future of Department of Defense Global Health Engagement," *Joint Force Quarterly* 80, no. 1 (2016): 37-44.

[31] Roberto N. Nang and Keith Martin, "Global Health Diplomacy: A New Strategic Defense Pillar," *Military Medicine* 182, no. 1 (2017): 1456-1460.

[32] Josh Michaud and and Jennifer Kates, "Global Health Diplomacy: Advancing Foreign Policy and Global Health Interests," *Global Health: Science and Practice* 1, no. 1 (2013): 24-28.

next global health threat.[33] Their assertion coincides with the following global health-related themes found in current literature and with Secretary James N. Mattis' remarks during the release of the 2018 National Defense Strategy (NDS).[34]

> The defense strategy's primary lines of effort will restore our comparative military advantage. We are going to build a more lethal force. We will strengthen our traditional alliances and build new partnerships with other nations. And at the same time we'll reform our department's business practices for performance and affordability . . . History has proven that nations with allies thrive, an approach to security and prosperity that has served the United States well in keeping peace and winning war. Working by, with, and through allies who carry their equitable share allows us to amass the greatest possible strength.[35]

Finding 1: Local is Global—No Such a Thing as an Isolated Threat

Insurgencies and terrorist organizations are rampant worldwide. Countries like Syria, Afghanistan, Sudan, and the Democratic Republic of Congo continue to witness corrupt governments and insurgent groups that hijack the state, infrastructure, and their people. These actors to which the DOD commits much of its resources to combat, violate segments of their societies, and fail to provide the necessities that are fundamental to human security. Population displacement, violence, environmental degradation, and infectious diseases that remained relatively isolated in the past have become a concern to U.S. public health, economic productivity, military readiness, and security.[36]

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[33] Nang and Martin, "Global Health Diplomacy," 1456-1460.

[34] James N. Mattis, "Remarks by Secretary Mattis on the National Defense Strategy," U.S. Department of Defense, January 19, 2018, https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1420042/remarks-by-secretary-mattis-on-the-national-defense-strategy/.

[35] Ibid.

[36] Nang and Martin, "Global Health Diplomacy," 1456-1460.

In 2014, the World Health Organization (WHO) declared a series of Ebola virus disease (EVD) outbreaks as an international public health emergency. President Barack Obama referred to EVD as a national security priority. What began as a few isolated outbreaks urgently required the attention and resources of the international community.[37] While the U.S. and international stakeholders responded exceptionally well to EVD, current and emerging infectious diseases like severe acute respiratory syndrome, extremely-drug resistant tuberculosis, and Zika virus disease can potentially reach epidemic levels in unstable or socioeconomically disadvantaged regions. Subsequently, they can spur global pandemics, overwhelm domestic resources, and compromise the security of the U.S. Perhaps there is nothing more resounding in this regard than the world's current plight with the coronavirus disease 2019 (COVID-19) pandemic.

Finding 2: Global Health is a Strategic Enabler

President Theodore Roosevelt's foreign policy in 1901 was "speak softly and carry a big stick." The ideology has since evolved into the concept of "smart power," which underpins the notion that prevention of war can be facilitated through the prevention of disease.[38] In the last two decades, the U.S. military struggled to sustain its role in the Nation's over-militarized stance on foreign policy, which stemmed from the provocations of extremists in the 9/11 terrorist attacks and the events that followed.[39]

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[37] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61.

[38] Ibid.

[39] Joseph S. Nye Jr., "Obama's Smart Power," *New Perspectives Quarterly* 26, (2008): 7-9.

Securing America's dominance in today's multi-domain global environment requires a new driving force in foreign policy. Global health presents a wide range of opportunities to use non-kinetic means to address the root causes of regional instability and insurgencies. Global health diplomacy is an underutilized capability in this regard.[40] Mil-Mil health engagements via the exchange of expertise between functional counterparts is a unique dimension of global health that best fits the training and resources of the DOD.[41]

Finding 3: Restoring the DOD's International Credibility Requires Investments in the Modernization of Health Systems

Per the current NDS, the DOD's enduring mission is to provide a combat-credible force needed to deter war and protect the security of the U.S. The NDS recognizes the erosion of the U.S. military's international credibility while China and Russia's strategic influence are on the rise. The prevalence of global disorder continues to shift the world's security context, becoming increasingly complex and volatile in nature. The NDS is clear in its acknowledgment that the DOD must invest in the restoration of its international credibility to remain competitive against peer and near-peer actors. The investment in modernization dictates a change in the way the DOD organizes and employs its forces.[42]

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[40] Nang and Martin, "Global Health Diplomacy," 1456-1460; Neel, "The Medical Role in Army Stability Operations," 605-608.

[41] Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

[42] Secretary of Defense (SECDEF), *Summary of the 2018 National Defense Strategy of the United States of America: Strengthening the American Military's Competitive Edge* (NDS), (Washington, DC: Department of Defense, January 19, 2018).

The restoration of credibility also lies with the DOD's ability to meet future challenges in its employment of the MHS. While the U.S.' military health capabilities are unmatched, the NDS dissuades complacency on concerns like the pandemicity of infectious diseases. Regardless of existing technical competence and capabilities, military medical personnel stands to benefit from a bidirectional exchange of knowledge with nations who have experience with such health threats.[43] Opportunities to capitalize on health engagements to train servicemembers using real-world global health threats (e.g., COVID-19, natural disasters) are at hand. They can be accomplished through (1) Mil-Mil engagements on health issues pertinent to the DOD and its partners, (2) international officer exchanges, and (3) programs that enable cultural understanding, the practice of technical competencies, and the improvement of interoperability between partner nations.[44].

Finding 4: Disaster Resilience is an Exercise of Protection

The USG must protect the Nation from harm. Protection extends beyond the foreign battlefield and defense of the homeland. The DOD has an inherent responsibility to protect the Nation through *disaster resilience.*[45] Proper execution of disaster

[43] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; SECDEF, NDS.

[44] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398.

[45] *Disaster resilience* is the ability of individuals, communities, organizations, or countries exposed to disasters, crises, and underlying vulnerabilities to anticipate, reduce the impact of disasters, cope with and recover from the effects of adversity without compromising their long-term prospects.

management depends on health systems which can function in synchrony to provide preventive and clinical services throughout all phases of natural or man-made disasters. Global health practice in the military is one way to improve disaster response and preparedness while also improving population health and continuing to advance the U.S.' strategic interests.[46]

The DOD's successful response to the 2010 Haiti earthquake and West Africa's Ebola crisis portray how similar efforts could be employed should disaster strike the U.S. Shortly after the 2010 Haiti earthquake, President Obama directed a *whole-of-government* response at the request of the Government of Haiti. With the U.S. Agency for International Development (USAID) in the lead, the DOD mobilized Joint Task Force (JTF)-Haiti to support Operation Unified Response, rendering humanitarian assistance and disaster relief alongside other response elements of the international community.[47] A Rand Corporation study of the 2010 Haiti earthquake reported that the U.S. effectively saved many more lives that would otherwise have been lost. Notably, the "speed that made Operation Unified Response successful may have been obtained at some cost in efficiency and acceptance of risk, but the cost and risks were mitigated by the leadership provided by the JTF-Haiti commander."[48]

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[46] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61.

[47] Gary Cecchine, Forrest E. Morgan, Michael A. Wermuth, Timothy Jackson, Agnes Gereben Shaefer, and Matthew Stafford, *The U.S. Military Response to the 2010 Haiti Earthquake: Considerations for Army Leaders* (Washington DC: Rand Corporation, 2013).

[48] Ibid.

The DOD's role positively contributed to the population-level health outcomes following the Haiti earthquake and West African EVD outbreak. It is worth citing that while simultaneously responding to these real-world events, military personnel were able to practice non-kinetic ways to protect the homeland from similar threats.[49] Considering that international disaster response to natural and man-made catastrophes are the military's most visible GHEs, the DOD must execute these missions with the utmost competence and effectiveness. The DOD's ability to respond to these threats in the international setting speaks volumes about their ability to protect the U.S. and respond to these threats domestically.[50]

Finding 5: The DOD Enables Alliances for Global Prosperity

In a recent interview, former Secretary of Defense James N. Mattis stressed that "throughout history, we see nations with allies thrive and nations without allies wither."[51] Through the DOD's initiatives, global health diplomacy may be used to position the U.S. in a leadership role to convene allies, strengthen bonds, and leverage assets to address common threats. By spreading the burden of global health threats, collaborating nations can reap many-fold the health and governance benefits that improve regional stability and

[49] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398; Nang and Martin, "Global Health Diplomacy," 1456-1460.

[50] SECDEF, NDS; Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

[51] James N. Mattis, "Nations with Allies Thrive, Nations without Allies Wither," interview by Steve Inskeep and Greg Myre, *Morning Edition* podcast on *National Public Radio,* September 02, 2019, https://www.npr.org/2019/09/02/756681750/jim-mattis-nations-with-allies-thrive-nations-without-allies-wither.

security. Global health diplomacy is an opportunity to assemble nations and groups to share needs, best practices, and innovations, especially in the realm of public health. Bringing together nations in tension to train towards a common goal like health systems modernization could break down barriers and provide a platform for collaboration rather than conflict.[52]

Further, Mil-Mil health engagements can bridge the gap between the U.S. and partner nations' capacity for humanitarian relief, disaster response, and peacekeeping. Mil-Civ health engagements can support host nation health sector development with activities like bilateral exchanges in knowledge and regional expertise.[53] Mil-Mil and Mil-Civ engagements not only increase host nation capability, they also help address concerns with sustainability and the protracted presence of military personnel in host nations. These types of partnerships enable developing nations and the U.S. to thrive and for alliances to be reinforced across the global community.

Finding 6: Health is an Effective and Ethical Platform for Engaging Foreign Nations

The concept of partner or host nation engagement applies in various contexts, as seen in the last two decades' security cooperation and disaster response efforts.[54] While the Law of Armed Conflict (LOAC) supports the provision of care to enemy combatants

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[52] Nang and Martin, "Global Health Diplomacy," 1456-1460.

[53] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398; Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

[54] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61.

on the battlefield, the military's humanitarian traditions have extended the benefit of care to local non-combatants. Activities related to health and healthcare are intended to be temporary until the responsibility can be transitioned to the host nation.[55]

In the Vietnam War, the U.S. Medical Service upheld the tradition of going beyond the LOAC. The Medical Civil Assistance Program (MEDCAP) employed military resources to improve the health of civilians. Military medical personnel directly and indirectly supported the ethical treatment of civilians during the war by conducting activities to relieve immediate medical problems among civilians. MEDCAP activities promoted the legitimacy and favorable image of the Central Government of Vietnam and the U.S. in the general population. These MEDCAP activities were also used in short-range and long-range initiatives to improve Vietnam's medical and health standards and practices through education.[56]

An example of a MEDCAP I activity was a counterpart program where U.S. advisors provided guidance to the Army of Vietnam's medical personnel while remaining behind the scenes. The emphasis was the legitimization of the Government of Vietnam's image. MEDCAP I activities alleviated some determinants of insurgency and indirectly secured and aided the execution of civilian medical activities as the Government of Vietnam underwent maturation.[57] Mil-Mil engagements similar to MEDCAP I continue to be relevant in military operations across the Middle East, Asia, and Africa, where poor

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[55] Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44.

[56] Neel, "The Medical Role in Army Stability Operations," 605-608.

[57] Ibid.

security can hinder the viability of civilian health systems. These Mil-Mil engagements are primarily employed so that when U.S. military troops withdraw, the host nation's military personnel can continue to supplement the needs of the civilian populace as their civilian health systems undergo maturation.[58]

The global health community recognizes that the inequities between developed and developing countries are politically, socially, and economically unacceptable. While the U.N. High Commission of Human Rights repeatedly recognizes health as a basic human right in international law, the DOD has never obligated its assets to facilitate human rights in an official capacity.[59] Still, the extent of gross human rights abuses observed in Syria, Sudan, and North Korea, have spillover effects on human security and stability worldwide. There is an indirect but significant relationship between the ethical ramifications of ongoing human rights violations and the DOD's ability to succeed in its mission to deter war and protect the security of the U.S.[60] It is imperative for the DOD to affirm and act on its stake in the world's health systems, whether it is pertinent to the fundamental rights of all people or the idea that global health threats ultimately have an impact on the health and welfare of the American people.

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[58] Nang and Martin, "Global Health Diplomacy," 1456-1460; Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44; Neel, "The Medical Role in Army Stability Operations," 605-608.

[59] Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44.

[60] Nang and Martin, "Global Health Diplomacy," 1456-1460.

Arguments against Military Global Health Activities

The evolving nature of global health as its own discipline contributes to some ambiguity and unwieldiness in how it is employed in the military operational environment. The use of defense assets for GHAs is unsurprisingly met with skepticism inside and outside the DOD. While there are recently published DOD instructions and directives supporting GHEs, there are three main arguments against the broader execution of GHAs.

Argument 1: The Effectiveness of Military Global Health Practice is not Well-Evidenced

The non-military global health community have expressed reservations about the DOD's role in global health. These reservations are partly attributable to an information and professional culture gap. A Kaiser Foundation report found differences in approach, organizational culture, and even health-related lexicon used by the DOD and their civilian counterparts. Civilian health professionals lack a complete understanding of the MHS and the DOD. Conversely, the military's health community is limited by the information-sharing constraints of the DOD as it relates to security-related activities, associated intents, and means used to achieve them. As a whole, the DOD is misaligned with the methods and principles characteristic of civilian GHAs. The lack of interface and transparency between civilian and military global health practitioners is a primary reason for the disjointedness of their practice.[61]

[61] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; Beth Grill, Michael J. McNerney, Jeremy Boback, Renanah Miles, Cynthia Clapp-Wincek, and David E. Thaler, *Follow the Money: Promoting Greater Transparency in the Department*

The methodology and evidence base that is foundational to good science is lacking in many GHAs. Unlike the process of transparent and systematic investigation methods used by non-military scientific communities, the impacts of GHAs on the world's health systems have not been thoroughly evaluated using the same methods of inquiry. Experts in the military agree that military humanitarian assistance activities, for example, have avoided empirical scrutiny, which begs the question of whether their reported successes are scientifically valid or anecdotal.[62]

In 2012, a Government Accountability Office (GAO) report on the military's humanitarian and development assistance cited concerns about poor data management, limited program evaluations, and limited program guidance. The former director of USAID expressed that while GHAs enhanced the image of the Armed Forces, long-term development was hindered, as conventional military personnel are not well-trained to work with foreign cultures and civil society.[63] Decision-makers and the scientific and humanitarian communities have yet to be presented with sufficient evidence to conclude that the DOD has been successful in the practice of global health.[64] Many even argue that

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of Defense Security Cooperation Reporting (Santa Monica, CA: Rand Corporation, 2017).

[62] Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115; Frederick M. Burkle Jr., "Throwing the Baby Out with the Bathwater: Can the Military's Role in Global Health Crises be Redeemed?" *Prehospital and Disaster Medicine* 8, no. 3 (2013): 197-199.

[63] Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

[64] Burkett and Quinnan, "Global Health and the U.S. Department of Defense: A Call for an Evidence Base," 1114-1115; Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

U.S. military health assets have only truly been effective in combat casualty care and the acute phase of disaster response, despite having a significant, enduring presence across the world.[65]

Argument 2: Deficient Strategic Integration and Sustainability of GHAs

While disaster response is a DOD mission, there is little evidence that humanitarian engagements have been sustainable or well-integrated into the strategic aims of military operations. The Kaiser Foundation's 2012 study on global health in the DOD raised skepticism about the immense budgets, utility, and validity of global health programs and activities that each branch of service executes under their own terms. The study claimed that GHAs are inconsistent in their coordination, monitoring, evaluation, and integration into long-term plans.[66]

Licina et al. emphasized that a significant barrier to GHAs is the poor predictability of funding authorities. Health capacity cannot be developed for long-term success in these current fiscal conditions. In the U.S. Army Pacific, only 2% of engagement funding requests were approved, amounting only to $119,000. Multiple and complex funding streams typically fund disaster preparedness activities and humanitarian missions. As a result, staffers often struggle to justify the resource requirements of each

[65] Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

[66] Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

activity to foreign assistance programs across 12 departments, 25 agencies, and 60 different government offices.[67]

Despite a demand by U.S. leadership, a recently published report about the increasing prevalence of GHAs by ESEOs, and a DOD policy for using GHAs to achieve partner nation stability and security, neither the DOD nor the Theater Security Cooperation[68] can provide the resources needed to adequately support sustainable engagements that can be effectively evaluated for progress towards desired outcomes.[69] A question that is hotly debated among the global health community is whether military initiatives in humanitarian operations have true value to the long-term health of individuals and populations. Measurement of effectiveness has been incorporated into DOD policy, yet the standard for monitoring and evaluating their long-term aggregate outcomes is yet to emerge.[70]

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[67] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398; Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

[68] *Theater Security Cooperation* describes military partnership activities conducted by the service components and COCOMs with partner nations. It is the application of U.S. resources in a joint, cooperative manner to advance the development of partner nation capability and capacity.

[69] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398.

[70] Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

Argument 3: GHAs are Only Partially Aligned with Humanitarian Principles

Apart from disaster response, GHAs are performed in accordance with the military's culture, traditions, and strategy[71] rather than humanitarian principles.[72] Thus, the accountability and transparency valued in humanitarian aid are not prioritized in the execution of GHAs.[73] Observers view the advancement of U.S. interests in the humanitarian space as inappropriate.[74]

International organizations (IOs) and non-governmental organizations (NGOs) often raise concerns that the DOD should not act as a humanitarian aid agency for two reasons. The DOD's humanitarian activities alongside IOs and NGOs potentially compromise the safety of their personnel and operations. The presence of uniformed servicemembers undermines the impartiality that traditionally entails humanitarian work. The issue of impartiality is especially problematic in regions with ongoing conflict, as IOs and NGOs may be subject to unnecessary violence in places where anti-American or anti-Western sentiments are prevalent. Secondly, the DOD does not meet the accepted standards of practice for a humanitarian organization. Humanitarian activities should be conducted for the sole purpose of providing humanitarian assistance. While the DOD

[71] Burkle, "Throwing the Baby Out with the Bathwater," 197-199; Neel, "The Medical Role in Army Stability Operations," 605-608.

[72] *Humanitarian principles* refer to humanity, neutrality, impartiality, and independence. These principles serve as the foundational principles for humanitarian action. Compliance to these principles are essential to effective humanitarian coordination.

[73] Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

[74] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61.

executes many humanitarian aid and relief initiatives with humanitarian intent, some activities are conducted because they directly or indirectly tie into the U.S.' security agenda.[75]

However, it would be remiss to discount the DOD's vast humanitarian impact worldwide. The public is well-aware of the military's contributions to disaster response outcomes and relieving the suffering of disadvantaged populations. Quantifying humanitarian impact, however, is often a major issue by those who study whether the military should play a role in humanitarian activities. The measurement of lifetime outcomes and burdens of disease requires long-term presence and extensive resources. The DOD currently does not have the systems in place to capture these outcomes in their entirety.[76]

Framing the Enhancement of ESEO Global Health Practice Using DOTMLPF-P

Examination of the most current literature on GHAs assert that the future success and utility of GHAs are predicated on the actions taken to improve their areas of deficiency. While ESEOs are not formally recognized as global health practitioners, they have leveraged their public health competencies in the global health space for decades. In the 2020 WaSH in Practice study, ESEOs were asked about the extent to which they applied a set of 25 competencies developed by the Consortium of Universities for Global Health (CUGH). ESEOs *greatly applied* 9 of the 25 CUGH competencies and *moderately*

[75] Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44.

[76] Ibid.

applied 12 of the 25 competencies. The study results overwhelmingly supported the notion that ESEOs are applying most of the global health competencies recognized by the CUGH, which are the same competencies taught by accredited graduate schools of global public health for civilian practitioners.[77]

The following sub-sections outline a synthesis of the overarching recommendations for the enhancement of modern global health practice. The ideas are framed using DOTMLPF-P and examined considering the roles that ESEOs play in the global public health space. While formal global health-related authorizations of ESEOs to serve in SOF and Joint commands have emerged in recent years, these changes have not been replicated across COCOMs and Theater Special Operations Commands (TSOCs). Therefore, the DOTMLPF-P framing will encompass all known conventional roles and responsibilities of ESEOs, so as not to limit the study within the scope of those formal authorizations.[78]

Doctrine

Systems-Thinking and Socioecological Models

Although the provision of health as a human right is not an explicit mission of the DOD, health equity is a function of a civil and just society. Thus, health equity is a factor in achieving human security and stability objectives across various military operations

[77] Argueza-Prince, "WaSH in Practice," 52-55.

[78] Derek Licina, Dennis Rufolo, and Mike Story, "Priorities for a 21st-Century Defense: Aligning U.S. Army Environmental Science and Engineering Officer Resources with the Department of Defense Strategic Guidance," *Journal of Special Operations Medicine* 13 (2013): 38-43.

worldwide. By incorporating and emphasizing systems-thinking and socioecological models in preventive medicine and public health doctrine, ESEOs can employ their competencies synergistically with other health enablers to accomplish their FHP objectives while also supporting the achievement of health as a human right.[79] These cognitive approaches to global health problems have already been introduced in National Security Presidential Directive 44 and the U.S. Global Health Initiative, thus underscoring the strategic-level precedence for adopting systems-thinking and socioecological models.[80]

Whole-of Society Approach

Like systems-thinking and the Socioecological Model Framework, the whole-of-society approach coincides with the DOD's ongoing movement towards interoperability. In the future, ESEOs' contributions to Joint and multinational operations may require greater interface with civil society stakeholders, including the U.S. Department of State, USAID, NGOs, universities, non-military health organizations, private enterprises, and partner nations.[81] As such, doctrinal references for public and global health should also incorporate the concept of the whole-of-society approach.

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[79] Nang and Martin, "Global Health Diplomacy," 1456-1460; Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115; Burkle, "Throwing the Baby Out with the Bathwater," 197-199; Golden and Earp, "Social Ecological Approaches to Individuals and Their Contexts," 364-372.

[80] Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44.

[81] Addy et al., "Whole-of-Society Approach for Public Health Policymaking," 216-229; Golden and Earp, "Social Ecological Approaches to Individuals and Their

Systematic Approach to Modern Global Health Practice

The DOD has not yet adopted the systematic approach to modern global health practice, particularly in the ESEO community where the discipline is not a standard component of ESEO roles and responsibilities.[82] Military reporting culture exacerbates the problem of relevance in the ESEO community. Global health efforts are under-recognized because public health outcomes like those that prevent DNBI or produce long-term yields are difficult to quantify. As a result, the utility of public health services is undervalued until a quantifiable event occurs.[83]

While various military branches have always collected their own GHA results, some experts recently proposed how to do so in the broader sense. GHAs, as they pertain to the roles of ESEOs, require a reliable system of evidence collection to better inform future decisions about how the AOC executes GHAs. Broader applicability of GHAs may emerge when there are consistent findings, patterns, and lessons from the collective. These data must then be synthesized for communication to the appropriate decision-

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Contexts," 364-372; Sean Murphy, "Military Health Engagement—Lest We Forget," *Military Medicine* 176, no. 9 (2011): 967–971.

[82] Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115.

[83] Fazal Hussain and Antonio Delgado, "Quantification of Global Health Impact," *Military Medicine* 15, no. 11-12 (2020): 467-468, https://doi.org/10.1093/milmed/usaa191; James D. Shelton, "Evidence-Based Public Health: Not Only Whether it Works, But How it Can Be Made to Work Practicably at Scale," *Global Health: Science and Practice* 2, no. 3 (2014): 253-258; Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

making and funding authorities, stressing a doctrinal need for consolidating such information coherently and systematically.[84]

Organization

Formal Authorizations in SOF and Conventional Units

The DOD's strategic guidance in 2012 called for a recalibration of capabilities and selective additional investments to succeed in the missions of counterterrorism, irregular warfare, stability operations, and conducting humanitarian and disaster relief operations.[85] Only one command within the DOD has seen organizational changes that support these four missions—the Special Operations Command (SOCOM). The 72D is one AOC in the Medical Service Corps specifically and uniquely trained in public health. They have been tested in their ability to meet these SOCOM mission sets per the Universal Joint Tasks List. Formal authorizations for ESEOs to serve in SOF and Joint commands have been recently made. However, replication of these authorizations across all COCOMs and TSOCs has not yet come to fruition. The initiative by SOF and Joint commands convey that conventional units should also consider organization-level

[84] Hussain and Delgado, "Quantification of Global Health Impact," 467-468; Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398; Shelton. "Evidence-Based Public Health," 253-258; Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

[85] Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43; Secretary of Defense (SECDEF), *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: Department of Defense, January 3, 2012), https://archive.defense.gov/news/Defense_Strategic_Guidance.pdf.

adjustments to their authorizations, as ESEOs have demonstrated both competence and capability in supporting both unit FHP requirements and GHAs.[86]

Intergovernmental and International Organization Liaisons

Personnel in the Medical Service Corps and other military branches "often without formal public health training or tactical and operational experience commensurate with ESEOs," are selected as public health liaisons for the DOD. They serve in assignments at the Centers of Disease Control and Prevention (CDC), USAID Office of Military Affairs, Department of Health and Human Services Office of Global Affairs, and the WHO, "to facilitate interagency and international collaboration on programs related to global health."[87] These types of assignments require further consideration in the talent management arena, as ESEOs have both the tactical or operational experiences and academic public health preparation to serve effectively in these organizations. Licina et al. recommended two changes regarding these assignments. Field-grade ESEOs should be assigned to "Joint and interagency organizations where public or global health requirements either exist or are projected." For company-grade officers, internship opportunities could be made available to "later feed into future field-grade assignments with interagency and international organizations."[88]

[86] Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

[87] Ibid.

[88] Ibid.

Training

Optimizing Existing Programs of Instruction

One of Licina et al.'s top recommendations for advancing the relevance of the 72D AOC to meet the priorities of the DOD is a review of the existing programs of instruction (e.g., 6A-F5).[89] Their commentary suggests that courses which are foundational to the ESEO's institutional training and technical knowledge base should serve as the forum for aligning the field with the DOD's strategic priorities and the projected needs of future GHAs.

Practice in Interoperability and Stakeholder Integration

Cooperation and collaboration among stakeholders are vital to the whole-of-society approach. Health threats that concern FHP also have the potential to negatively impact civilians and non-U.S. military populations across the operational area. In Thailand's Greater Mekong region, NGOs, IOs, and partner nations successfully employed a strategy to control and eliminate drug-resistant *Plasmodium falciparum* malaria. While conducting training in Thailand, the U.S. Indo-Pacific Command identified risks that extended beyond the host nation's capabilities. Through Mil-Mil engagements, Thai, U.S., and interagency partners embarked on a concerted effort to eliminate drug-resistant malaria. The activity required the involvement of the Global

[89] Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

Fund and the President's Malaria Initiative for longer-term, multi-agency efforts to address the regional health threat.[90]

In the DOD's response to the EVD epidemic, the U.S. Air National Guard with their ten expeditionary medical support systems, were employed to assist international stakeholders who provided care for EVD patients across several West African nations. The coordinated response of the U.S. Army and NGOs depicts how military assets can be used effectively during global health emergencies. The EVD GHA highlighted the logistical mobility of the DOD and its ability to deploy emergency equipment and highly trained personnel on short notice.[91]

These examples validate why interoperability is critical to military operations. The premise is even more relevant to ESEOs now as responses to global pandemics and other public health emergencies overextend their low-density AOC. Interoperability and integration among military, governmental, and civilian stakeholders present an opportunity for nations and institutions to train together in emergency preparedness, to share needs, best practices, and innovations. Such efforts also mean that non-military stakeholders can better focus on long-term health objectives after military partners have successfully transitioned the humanitarian or emergency recovery efforts back to the host nation.[92]

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[90] Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44.

[91] Ibid.

[92] Nang and Martin, "Global Health Diplomacy," 1456-1460.

Training Programs Focused on Areas of Health Expertise

Peer-reviewed commentary about GHAs argue that the most effective military health engagements were those executed during health emergencies. These were limited to the acute phases of disaster response. Some suggest that Mil-Mil or Mil-Civ training and knowledge exchange initiatives have also been fruitful.[93] Cullison et al. proposed that GHAs should focus on areas where the military has well-evidenced strengths. Mil-Mil engagements in preventive medicine, namely the published successes of ESEOs during their FHP missions in OIF and OEF, Mil-Mil and Mil-Civ partnerships related to FHP at overseas medical research laboratories, and training for disaster and emergency preparedness are some of the strongest areas of health expertise in the MHS.[94]

Materiel

The literature review did not yield any materiel-related deficiencies and solutions that were pertinent to the ESEOs' practice of global health. However, implementation of changes in other domains of DOTMLPF-P may warrant future changes in the materiel domain.

Leadership and Education

When ESEOs were asked to share the preparatory experiences that contributed to their successful execution of GHAs, 39% of ESEOs participating in the WaSH in Practice

[93] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; Burkett and Quinnan, "Global Health and the U.S. Department of Defense," 1114-1115; Neel, "The Medical Role in Army Stability Operations," 605-608.

[94] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

study attributed their success to "assignments which entailed on-the-job training or opportunities that focused on WaSH-related competencies." They referred specifically to assignments in institutional or non-deployable organizations that offered opportunities to learn or practice WaSH competencies in low-risk settings. Their feedback specified assignments at Public Health Command environmental health and engineering divisions, courses on food and water vulnerability, and the execution of food and water vulnerability and risk assessments in non-deployed settings. These findings suggest that organizational leaders should make deliberate efforts to include the practice of global health competencies in low-risk institutional settings and global health topics into their leader development programs.[95]

Personnel

In the 2020 WaSH in Practice study, an estimated 68% of ESEOs in the ranks of 2LT to MAJ participated in at least one GHA compared to 31% of ESEOs having no experience in GHAs between 2008 and 2020. Of the 68% who participated in GHAs, only 40% possessed graduate degrees from an institution accredited by the Council for Education in Public Health (CEPH). This finding is relevant because while ESEOs who are accessed into the Army primarily consist of personnel who have undergraduate degrees in the health sciences, biological sciences, physical sciences, and engineering, only 27% enter the 72D career field with a CEPH-accredited undergraduate degree. What can be inferred from this information is that only approximately 27% of ESEOs have been exposed to the global health competencies outlined by the CUGH and have the

[95] Argueza-Prince, "WaSH in Practice," 56-58.

foundational skills and competencies commensurate to their civilian global health counterparts upon accession.[96]

The chief recommendation to address the gap in qualified personnel lies in the Army's Talent Management System. A significant number of the surveyed population of ESEOs from the WaSH in Practice study recommended that assignments with an expected global health component should be reserved for ESEOs with the appropriate academic background and experiences.[97]

Facilities

The literature review did not yield any facilities-related deficiencies and solutions that were pertinent to the ESEOs' practice of global health. However, implementation of changes in other domains of DOTMLPF-P may warrant future changes in the facilities domain.

Policy

The inclusion of the global health discipline across the U.S. military services is hindered by complex and inconsistent funding streams, the lack of sound assessments and evaluation processes, and deficient metrics to measure effectiveness.[98] The deficiencies

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[96] Argueza-Prince, "WaSH in Practice," 56-58; Council on Education for Public Health, "Accreditation Criteria," October 2016, https://ceph.org/about/org-info/criteria-procedures-documents/criteria-procedures/2021-revisions-criteria/.

[97] Argueza-Prince, "WaSH in Practice," 60-61.

[98] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398; Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61.

associated with these three enablers must be rectified to garner buy-in and long-term fiscal investment from leaders and policymakers. As an arm of the USG, the DOD has a fiscal and ethical responsibility to adopt the modern, evidence-based practice of global health, conduct monitoring and evaluation activities, and improve the accountability and transparency of its long-term aggregate outcomes. Policies for evidence collection, data management, scientific research, and publishing current, peer-reviewed evidence are a necessary step in achieving those ethical and fiscal responsibilities.[99]

Summary

The scoping literature review broadly established that the discipline of *global health* supports the U.S.' security agenda. A growing body of peer-reviewed literature across multiple disciplines presented evidence of a national security imperative to invest and prepare for the next global health threat.[100] Five salient findings emphasized that the complex global environment requires a non-isolationist view of public health. Health threats, natural and man-made disasters, security threats, and civil concerns are interconnected. Each of these presents the potential to impact the U.S.' interests at home and abroad.

Multiple shortcomings about the global health practice of ESEOs were identified across the DOTMLPF-P domains. The literature presented three overarching issues within the Training domain that the 72D AOC should consider in its efforts to remain relevant today and against the future challenges of global health.

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[99] Burkle, "Throwing the Baby Out with the Bathwater," 197-199.

[100] Nang and Martin, "Global Health Diplomacy," 1456-1460.

1. Optimize existing programs of instruction to align with the DOD's strategic priorities and projected needs for future GHAs.[101]
2. Practice interoperability and stakeholder integration, particularly when health threats that impact FHP also concern populations that work or exist alongside U.S. military populations.[102]
3. Focus GHAs on areas where the military have well-evidenced strengths; leverage success of ESEOs in their FHP missions, Mil-Mil exchanges, and Mil-Civ partnerships.[103]

Within the Leadership and Education domain, the 2020 WaSH in Practice study suggested that organizational leaders must coordinate opportunities for junior ESEOs to practice global health competencies in low-risk institutional settings and make deliberate efforts to incorporate global health topics into their leader development programs.[104]

[101] Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

[102] Nang and Martin, "Global Health Diplomacy," 1456-1460; Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44; Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

[103] Cullison, Beadling, and Erickson, "Global Health Engagement," 54-61; Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

[104] Argueza-Prince, "WaSH in Practice," 56-58.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The cross-sectional, mixed-methods study provides AMEDD leaders and the 72D Consultant Team with quantitative and qualitative evidence of the actions that should be taken in the academic training and professional development of ESEOs, to better prepare junior officers in the modern practice of global health. The study comprised of a scoping literature review and interviews about the global health experiences of 20 Active Duty ESEOs in the rank of Lieutenant Colonel (LTC). The quantitative and qualitative results were analyzed in conjunction with the 2020 WaSH in Practice study's findings, which surveyed 63 Active Duty ESEOs in the ranks of 2LT to MAJ. Both cohorts' data represent global health experiences between 2008 and 2020.

Methodology

Scoping Literature Review

The scoping literature review of current peer-reviewed publications and gray literature provides contextual information on the topic of global health and answers the key global health-related issues and recommendations pertinent to the 72D AOC (Secondary question #1), see Figure 1. The following databases were used to perform the literature search: Scopus, ProQuest, Global Health, PubMed, Articles+, and Google Scholar. The following terms were used for the literature search: Army, Department of Defense, Defense Health Agency, Capacity Building, Disaster Response, Emergency Response, Environmental Science and Engineering Officer, Environmental Engineer,

Environmental Science Officer, Field Sanitation, Force Health, Force Health Protection, Global Health, Global Health Engagement, Global Public Health, Humanitarian Response, International Health, Joint, Medical Department, Military, Military Medicine, Partnership, Public Health, Sanitation Officer, Security Assistance, Training Exercise, and Village Stability Operations.

Due to the limited peer-reviewed studies specific to the 72D AOC, evidence from the greater military global health community was used to fill gaps in information, with the understanding that some findings may not be fully generalizable to the ESEO community. Overarching themes in the peer-reviewed literature were framed using DOTMLPF-P.

Cross-Sectional Mixed Methods

Thirty-seven ESEOs were eligible to participate in the study. Criteria for inclusion were Active Duty ESEOs in the rank and grade of LTC (O-5). Those listed in the 67C (Preventive Medicine Functional Area) roster distributed by the 72D Consultant Office as of February 2021 were considered for inclusion. Only those who were available for an interview via telephone were included due to limited means of remote contact. O-5 ESEOs serving in the U.S. Army Reserve and Army National Guard were excluded due to the investigator's lack of access to Reserve and National Guard contact rosters.

One-on-one telephonic interviews with LTCs were used to capture the prevalence measure and characterization of their global health experiences from 2008-2020. Combining the scoping review and telephone interviews leveraged primary and secondary data to answer the primary question of what actions should be taken in the academic training and professional development of ESEOs to better prepare the junior

officers in the modern practice of global health, see Figure 1. As referenced in Figure 1, secondary question 1 was answered using the scoping literature review. Secondary question 2A was answered using the 2020 WaSH in Practice study's data.[105] Secondary questions 2B, 3A, 3B, 4A, and 4B were answered using the primary data derived from the telephone interviews of the LTC cohort.

Interview Design, Cognitive Interviews, and Piloting

Ten quantitative and qualitative questions were drafted for the telephone interviews. Most questions were open-ended to capture as much descriptive information as possible. With the assistance of 3 interviewees, questions were tested using cognitive (think aloud) interviews over the phone. The pilot interviewees met via teleconference to examine the clarity, brevity, flow, and ease of answering the interview questions. Questions were revised if at least two pilot interviewees provided similar feedback about a specific question. After the final revision of the question set, the interviewees were called separately to pilot test the final questions. The pilot results were used to test the data analysis methodology. The results were also excluded from the final data collection because the pilot interviewees were exposed to the concepts and questions multiple times as the interview verbiage was refined. The final list of interview questions is included below.

1. Describe your undergraduate and graduate civilian education background.
2. Are any of your degrees accredited by CEPH or other accrediting institutions? Provide an answer for each of your degrees.

[105] Argueza-Prince, "WaSH in Practice," 35-67.

3. Review the definition of GHAs and provide examples to the interviewee before proceeding: Have you ever participated in or supervised a GHA as an ESEO? (Yes/No), expand on your answer as needed.
4. Review the definition of WaSH and provide examples at varying levels before proceeding: Did any of your GHAs focus on a WaSH problem or intervention? (Yes/No), proceed to questions 5-10 if the answer is Yes.
5. What is the estimated number of WaSH GHAs you participated in or supervised between 2008 and 2020? Only include GHAs conducted in your role as an ESEO. Expand on your answer as needed
6. Describe the types of WaSH GHAs you participated in or supervised between 2008 and 2020. Only include GHAs conducted in your role as an ESEO.
7. Based on your experiences as an ESEO, what type of skills, attributes, or competencies do you think are the most relevant to the future success of junior ESEOs in WaSH GHAs?
8. Based on your experiences, what is your assessment about the inclusion of global health or global health competencies in the training and education of junior ESEOs, for example, in courses like 6A-F5? Refer to the list of CUGH GHECTK competencies, as needed.
9. What actions should be taken to develop junior ESEOs in the Institutional, Operational, and Self-Development domains to facilitate their success in GHAs?

10. Review definition of Multi-Domain Operations (MDO) before proceeding: Based on your experiences, how can junior ESEOs be developed to best support MDO in the future?

Recruitment and Standardization of Study Conditions

Eligible ESEOs were contacted individually via email and/or phone at least two times using the information listed in the 67C roster. Once voluntary informed consent was obtained, interviewees were provided a 1.5-page topic overview via email to standardize the study's conditions and minimize errors in the interview format. The overview provided standardized definitions of terminology, major talking points, and a list of global health competency examples which the participants could reference during the interviews.

Interview Execution and Data Collection

The interviews began by focusing each interviewee on the topic of global health, referencing the topic overview provided ahead of time. The investigator made a deliberate effort to emphasize the limits of the study, including specific global health-related terminology, the date range of experiences between 2008 and 2020, and keeping the discussion Unclassified. While the interviewees were briefed that the interviews were designed to last no more than 30 minutes, there were no formal time limits if the discussion stayed on-topic.

Data for each interviewee were typed manually during the interview. Note-taking only began after the participants had undergone an introduction to the study and the reaffirmation of informed consent. The notes did not capture interviewees by name and

ended immediately after the participant answered the final open-ended question. Notes were not labeled with any identifiable information. Typed interview transcripts were aggregated into one document, with each interviewee being assigned a random number to allow for blinding in the quantitative analysis.

Data Analysis

Immediately after each interview, the notes were read line-by-line, segmented into analytical units, and aggregated under each research question category. Raw data was deleted from the segmented data to minimize cognitive bias during analysis. A combination of deductive and inductive coding was used in the qualitative analysis. Using previous knowledge of GHAs from the 2020 WaSH in Practice study, *a priori* codes were developed initially to help organize the data. For example, when describing the ESEO demographic characteristics, the 2020 WaSH in Practice study showed that ESEOs in the ranks of 2LT-MAJ primarily held undergraduate degrees in health, physical, and biological sciences or engineering.[106] *A priori* codes for education background developed for the current study of LTCs mirrored those known categories from the 2LT-MAJ cohort. Another example of *a priori* coding is when a question involved multiple sub-categories for a potential answer. When a question asked what actions should be taken to develop junior ESEOs in the Institutional, Operational, and Self-development domain, the *a priori* codes were listed as those three separate domains.

Further analysis was conducted using thematic memoing and inductive coding. The investigator developed inductive codes as new or unexpected thematic patterns

[106] Argueza-Prince, "WaSH in Practice," 35-67.

emerged from the data. For example, when asked to describe the types of WaSH activities the LTCs participated in or supervised between 2008 and 2020, the *a priori* codes were Water, Sanitation, Hygiene, or a combination of WaSH principles. During the inductive coding and memoing process, the investigator found that the LTCs' feedback encompassed either capacity-building, capability development, or direct assistance-type activities. The investigator also noted differences between the echelons at which the ESEOs engaged with host or partner nation entities, which prompted the examination of the same data set using two different types of analytic lenses. Throughout the analysis, themes were enumerated by frequency to calculate counts, proportion, and confidence intervals from the data set.

The investigator used Open Epi and Microsoft Excel software for data management and analysis. Univariate statistical analysis included frequency and proportions (%) for period prevalence measures, which estimated the parameter and the 95% confidence interval (CI) to capture the margin of error above and below the estimate.[107] The frequencies of qualitative responses were recorded and a proportion measure was calculated to determine what percentage of interviewees provided feedback consistent with each of the deduced themes. A prevalence calculation with a 95% CI that does not cross the null value of 1 was used to confer statistical significance to the finding.

[107] Burt B. Gertsman, *Basic Biostatistics for Public Health Practice,* 2nd ed. (San Jose: Jones and Bartlett Learning, 2015).

Integration of Quantitative and Qualitative Elements

The study used a systemic integration of qualitative and quantitative elements during data collection, mixed-methods analysis, and interpretation. This method was beneficial because it facilitated an iterative process, particularly during data analysis. Data integration also supported the creation of narratives that gave participants a voice in the study and the advantage of validating their collective responses with statistical significance.

Mitigating Bias and Study Design Errors

The effect of information bias and cognitive bias on the study's internal validity was considered during the design phase. While developing the study, the following measures were taken to mitigate bias, systematic errors, and random errors.

1. Use of plain language; modification of terms to reflect common military terminology
2. Explicitly defining terms like *global health activities* with the assumption that interviewees could mistake them for *global health engagements*
3. Expressing the limits of the study and date range for the cross-sectional methods
4. Recurring reminders of key terms, acronyms, and their meaning throughout the interview
5. Providing examples (e.g., some types of GHAs are disaster relief missions, humanitarian response, civic action programs)

6. Designing an iterative questionnaire flow that funnels interviewees to the appropriate questions based on their previous responses (specifically to mitigate misclassification errors)
7. Conducting cognitive interviews and piloting the questions to refine for clarity, brevity, flow, and ease of use for the interviewer and interviewees
8. Removing all identifying information from the data set; assigning a random number to facilitate quantitative analysis
9. Immediately segmenting data after each interview and organizing the data set using *a priori* codes
10. Performance of inductive coding and thematic memoing after the entire data set is blinded and aggregated

An assumption noted by the investigator is the susceptibility of the interviewees to recall bias due to the study's cross-sectional design. The potential for imprecision due to the wide range of required recollection from 2008-2020 was expected with experiences closer to 2008. To mitigate recall bias, participants were asked to provide "best estimates" rather than specific dates to match their data. This enabled the investigator to analyze and interpret the data conservatively with estimates rather than exact counts.

The potential for selection bias was also considered. Two modes of recruitment (email and telephone) were used to reach the eligible population of ESEOs. To address the recruitment barriers presented by individuals not checking emails or emails going to spam folders, the investigator used telephonic recruitment as the primary means of contacting participants. Due to the differences in time zones and the varying accessibility of telephonic communication to or from overseas locations, the primary means of

recruitment favored ESEOs in locations within the Continental United States. ESEOs who know or have had previous professional interactions with the investigator may have imparted a higher recruitment success with those participants. While interviewer-interviewee blinding could not be used to mitigate bias, the removal of identifying information, immediate segmentation of the data at the end of each interview, and the performance of inductive memoing and coding after all segmented data were aggregated, mitigated some subjectivity in the analysis and interpretation of results.

Ethical Assurances

This study was approved by an Institutional Review Board. Participation in the study was voluntary. While the investigator used a by-name roster published by the 72D Consultant Office, aggregated data sets did not retain the identifiable information of participants. Interview data collected for this study will not serve as the primary data set for any future studies. Only the published results and interpretations from the 2020 WaSH in Practice literature were used for this study.

Summary

The methodology effectively asked what actions should be taken in the academic training and professional development of ESEOs to better prepare junior officers in the modern practice of global health. Four secondary questions and six tertiary questions answered the primary question. The study was completed utilizing a scoping review of existing peer-reviewed and gray literature, a recent mixed-methods study into the GHAs of ESEOs in the ranks of 2LT-MAJ, and the interviews about the global health experiences of 20 LTCs which were analyzed using a mixed-methods approach. The

integration of quantitative and qualitative data during collection, analysis, and interpretation supported the creation of narratives that gave voice to the participants and provided the study with the advantage of validating qualitative feedback within a specified threshold of statistical significance (95% CI).

CHAPTER 4

ANALYSIS

Study Population Demographics

Fifty-four percent (n = 20) of the 37 eligible ESEOs participated in the study. Demographic analysis indicated that the participants primarily consisted of those who held undergraduate degrees in the health, physical, or biological sciences (55%) or engineering (30%). None of the participants held undergraduate degrees in public health. Thirty percent attained degrees in public health at the Master's level and 10% at the doctoral level. All participants held at least one graduate degree, see table 1.

Table 1. Study Population Demographics

Characteristics	**n**	**%**
Eligible ESEOs (Active Duty O-5, LTC)	37	100%
Sample	20	54%
Civilian Education		
- Bachelor's – Public Health Sciences	0	0%
- Bachelor's – Health, Physical, Biological Sciences	11	55%
- Bachelor's – Engineering	6	30%
- Bachelor's – Other	1	5%
- ≥ 2 Bachelor's Degrees	1	5%
- Master's – Public Health	6	30%
- Master's – Health, Physical, Biological Sciences	1	5%
- Master's – Engineering	5	25%
- Master's – Other	6	30%
- Master's – None	0	0%
- ≥ 2 Master's Degrees	2	10%
- Doctorate – Public Health	2	10%
- Doctorate – No Doctorate Degree	18	90%

Source: Created by author.

The undergraduate degrees held by the LTC cohort were relatively consistent with the undergraduate degrees of the 2LT-MAJ cohort surveyed during the 2020 WaSH in Practice study. Among the ranks for 2LT-MAJ, 51% were accessed with degrees in health, physical, or biological sciences, while 14% were accessed with degrees in engineering. However, 27% of the more junior cohort held undergraduate degrees in public health from CEPH-accredited institutions, compared to 0% among the LTC cohort. These results potentially infer that as a cohort, more junior ESEOs are better prepared for GHAs from an institutional training standpoint, because CEPH-accredited curricula for undergraduate and graduate public health education are aligned with the CUGH's competencies for global health education and professional development.[108] The finding from the demographic analysis, however, is not conclusive. Further study is required to definitively support the conclusion that the accession of junior ESEOs with CEPH-accredited degrees makes them better prepared to execute GHAs in WaSH.

At the graduate level, there is only a 10% variation between the CEPH-accredited public health education of the 2LT-MAJ cohort (40%) compared to LTCs (30%). Because ESEOs choose to pursue graduate programs at different stages of their careers, it was expected that the more junior cohort reported lower percentages of graduate school completion (46% with no Master's degrees and 93% with no Doctorate degrees), while

[108] Argueza-Prince, "WaSH in Practice," 36; Barbara Astle, Carlos A. Faerron Guzman, Ayla Landry, LaHoma S. Romocki, and Jessica Evert, eds., *CUGH Global Health Education Competencies Tool Kit,* 2nd ed. (Washington, DC: Consortium of University for Global Health, Competency Sub-Committee, 2018).

the LTCs reported higher percentages of completion (0% with no Master's degrees and 90% with no Doctorate degrees).[109]

Comparing Global Health Experiences among Two ESEO Cohorts

The LTCs' feedback about the training and professional development of junior ESEOs would be generalizable to the junior cohort if the study demonstrates consistency across the two cohort's global health experiences. Secondary question 2 (see figure 1) asked whether there are differences between the global health experiences of the two cohorts. In a previous study of ESEOs in the ranks of 2LT to MAJ, 68% [95% CI: 0.55, 0.79] of the sample population confirmed participation in at least one GHA, with 54% [95% CI: 0.41, 0.67] practicing WaSH competencies in global health contexts.[110] Prevalence measures for experiences spanning between 2008 and 2020 were statistically significant.

The period prevalence of WaSH GHAs measured among the LTCs (n = 20) resulted in a statistically significant parameter consistent with the findings from the more junior cohort of ESEOs. Table 2 displays the proportion of LTCs who participated in or supervised at least *one* GHA, with the analysis delineating between the use of WaSH and non-WaSH competencies in their activities. Between 2008-2020, 100% [95% CI: 8.39, 10.00] of LTCs participated in or supervised GHAs, with 85% (n = 17) [95% CI: 6.39, 9.48] reporting that at least one of their activities focused on a WaSH-related issue or topic. The estimated range of WaSH-focused activities was between 10 and 100, with the

[109] Argueza-Prince, "WaSH in Practice," 36.

[110] Ibid., 37, 66.

mean frequency of 39 individual activities per study participant. The activities were specified as individual missions per deployment or temporary duty. Considering that 3 of the 20 LTCs indicated having participated in or supervised a non-WaSH-related activity, their feedback was excluded for the remainder of the analysis to focus the parameters on WaSH-type GHAs.

Table 2. Prevalence of Global Health Experiences among Active Duty ESEOs

Descriptor	**n**	**%**	**95% CI**
Sample	20	100%	8.39, 10.00
Participated in or supervised at least *one* GHA	20	100%	8.39, 10.00
Participated in or supervised at least *one* GHA in WaSH	17	85%	6.39, 9.48
Participated in or supervised a non-WaSH GHA	3	15%	0.52, 3.60
No experiences in global health	0	0%	n/a

Summary of the proportion of ESEOs (LTC, O-5) who reported supervising or participating in GHAs
(n = 37, total O-5 ESEOs as of February 2021)

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Source: Created by author.

When asked to describe the GHAs they participated in or supervised between 2008 and 2020, participants consistently described 12 types of WaSH activities. The inductive analysis found that these activities were broadly categorizable as direct assistance, capability development, and capacity building (see figure 2). Of the 12 types of reported WaSH activities, 68% [95% CI: 3.91, 8.62] were in direct assistance[111] to

[111] *Direct assistance* is defined in this study as Mil-Mil or Mil-Civ engagements where ESEOs provided in-person or direct reach-back support to host or partner nations'

host or partner nations. Predominantly, these activities comprised of Mil-Mil or Mil-Civ engagements with local or regional water providers, assessment of proposed host nation military facilities and living sites, disaster response missions, and technical assistance for emergency preparedness concerns. Next, 58% [95% CI: 3.20, 8.10] of the reported activities were categorizable under capability development.[112] They included local Mil-Mil engagements for implementing field-expedient water filtration solutions, building improved groundwater distribution structures, knowledge exchange for water systems protection and maintenance, and engagements to advise and assist foreign ministries, strategic level leaders, and governments with policy development and disaster resilience. Of the 12 activity types, 17% [95% CI: 0.47, 4.48] were categorized as capacity building.[113] However, the proportion of this activity category was inconclusive due to the lower limits of the 95% CI crossing the null value.

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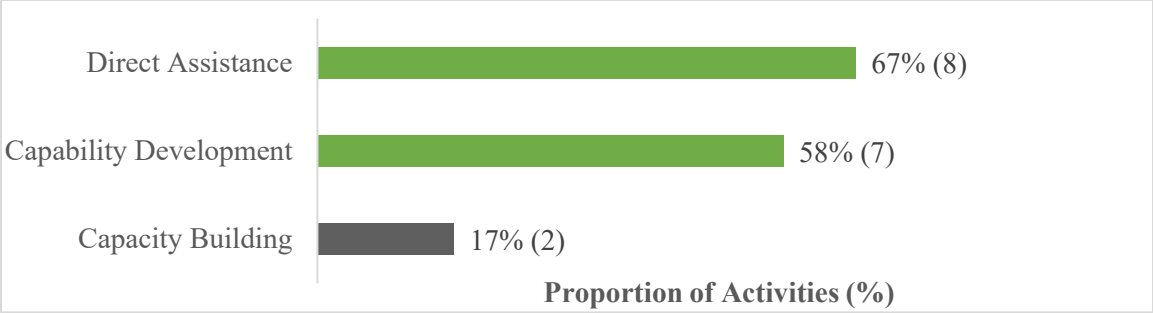
personnel, institutions, or populations using their technical expertise, manpower, or resources.

[112] *Capability development* activities are those where ESEOs supported the addition or improvement of a capability for the host or partner nation(s) to successfully pursue their interests, which are sometimes mutual with the U.S. Many times, the military capabilities allow countries to defend themselves or respond to non-conflict-related threats (e.g. natural or manmade disasters).

[113] *Capacity building* provides articles and services to build physical and organizational institutions or force structures to support the security of a host nation; these are activities where ESEOs assisted in the establishment and improvement of the institutional policies and processes necessary to plan, develop, resource, acquire, staff, employ, and sustain capabilities of mutual benefit.



Proportion of activities conducted by ESEOs in direct assistance, capacity building, or the development of capabilities in support of host or partner nation(s) (n = 12, activity types).
**Some activities supported host or partner nations in two or more categories*

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

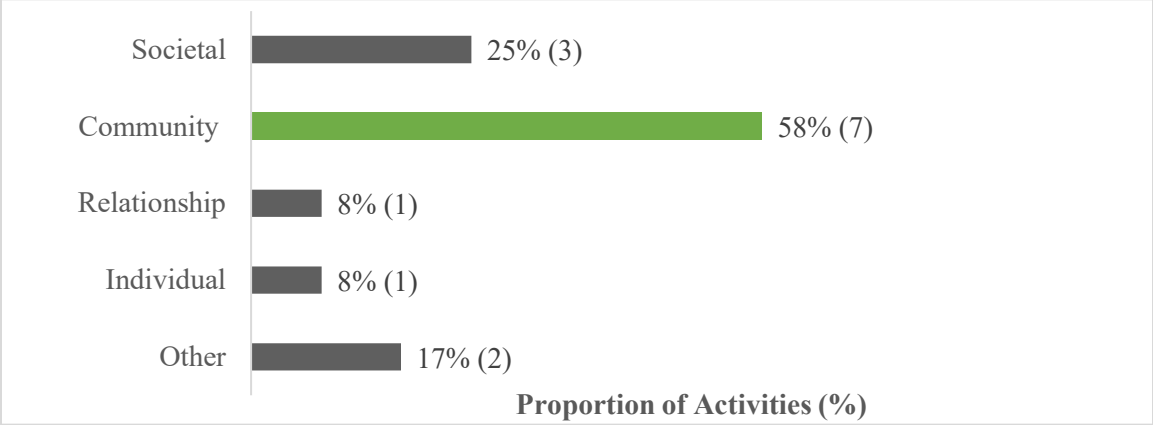
Figure 2. WaSH Activities in Global Health by Category, 2008-2020

Source: Created by author.

Using an alternative analytic lens, the reported activities were examined using the Socioecological Model Framework to better understand at which level(s) of public health systems do ESEOs conduct their work (see figure 3).[114] The categorization of 12 activity types using the Socioecological Model Framework yielded statistically significant results to infer that ESEOs primarily conduct GHAs at the community level [58%, 95% CI: 3.20, 8.07]. They leveraged the same WaSH competencies they used to execute their FHP mission to conduct GHAs with host nation or partner populations. The scales of impact described by the interviewees ranged from villages, brigade-sized footprints, to training for 30 personnel who would provide field sanitation services for division-sized elements.

[114] Addy et al., "Whole-of-Society Approach for Public Health Policymaking," 216-229.

The proportion of activities categorized under the societal, relationship, individual, and other levels did not yield statistically significant results.



Proportion of activities conducted by ESEOs categorized in each level of the Socioecological Model Framework (n = 12, activity types).
**Some activities spanned two or more levels of the Socioecological Model Framework*

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

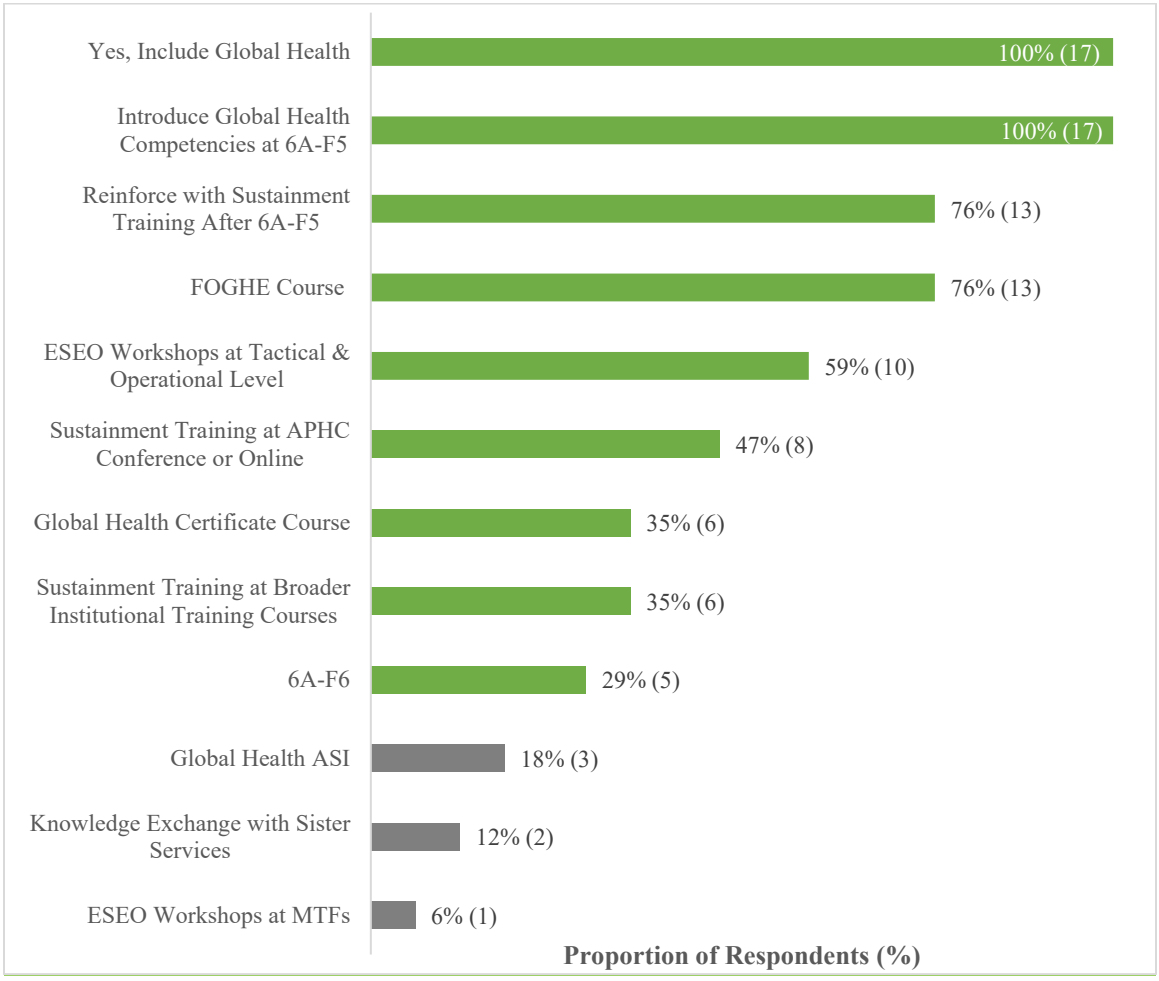
Figure 3. WaSH Activities in Global Health by Level of the Socioecological Model Framework, 2008-2020

Source: Created by author.

Assessing the Inclusion of Global Health Competencies

Secondary question #3 asked what the LTCs' assessments are about the inclusion of global health in the training and development of ESEOs. All LTCs [95% CI: 8.16, 10.00] answered "Yes," global health competencies and topics should be included in the training and development of junior ESEOs (see figure 4). Most responses added that regardless of rank, these competencies are relevant across the AOC. In their feedback, participants expanded on the types of training courses, venues, and ideas about where global health competencies should be included in the training and development of

ESEOs. All 17 participants [95% CI: 8.16, 10.00] concurred that 6A-F5 is the optimal venue to introduce topics and competencies related to global health because the course captures the widest audience of junior ESEOs prior to or within their first duty assignments.



Proportion of participants' responses when asked about their assessment of the inclusion of global health in the training and education of ESEOs (n = 17, # participants)

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Figure 4. Inclusion of Global Health Competencies in ESEO Training and Education

Source: Created by author.

The findings from the LTC cohort coincide with the 2020 WaSH in Practice study's assertion that 6A-F5 is the prime venue to include global health competencies.[115] The previous study found that among ESEOs in the ranks of 2LT thru MAJ (n = 63), lieutenants had the highest odds [Odds Ratio = 2.58, 95% CI: 1.30, 5.10] of participating in WaSH GHAs. Among the ranks of 2LT thru MAJ, 78% [95% CI: 0.60, 0.91] conducted these activities as part of their unit's missions. The same study found that only 34% [95% CI: 0.18, 0.54] *moderately* attributed their preparedness in executing GHAs to 6A-F5, followed by 31% [95% CI: 0.15, 0.51] *slightly* attributing preparedness to their attendance of the course.[116]

While the findings from both the 2LT-MAJ and LTC cohort studies generally coincide, the LTCs' responses provided more robust recommendations on how global health competencies should be included in training and development efforts. After introduction at 6A-F5, 76% [95% CI: 5.27, 9.04] of LTCs conveyed that newly-learned competencies must be continually reinforced through sustainment training, figure 4. The overwhelming majority suggested leveraging already established courses, namely the Fundamentals of Global Health Engagement (FOGHE) course and Global Health Certificate offered by the Uniformed Services University of the Health Sciences (USUHS).

Participants also named other potential venues where medical counterparts and other warfighting functions (WfF) would benefit from global health-related knowledge

[115] Argueza-Prince, "WaSH in Practice," 37-40, 67.

[116] Ibid., 43.

exchange, particularly with competencies related to whole systems (e.g., stability operations, whole-of-government approach). Thirty-five percent [95% CI: 1.73, 5.87] named courses such as the Medical Center of Excellence (MEDCoE) Officer Advanced Course, Food and Water Risk Assessment Course, Command and General Staff Officer Course (electives), Joint Medical Operations Course, and Public Health Program Management Course (6A-F6). However, due to the duty position or rank requirements associated with some of these courses, lieutenants may not stand to benefit significantly from the inclusion of global health in these venues.[117] One exception would be the Food and Water Risk Assessment Course, which is open to all ranks and duty positions.

The majority of LTCs strongly recommended going beyond the Institutional domain to reinforce global health competencies and the relevance of global health across the AOC. Sixty percent of LTCs [95% CI: 3.58, 8.02] conveyed that for ESEOs to succeed against the challenges of the future (e.g., hybrid threats, large scale combat operations, MDO), they must have a better understanding of how to apply scientific principles to real-world problems in a multitude of operational contexts. At the tactical and operational level, training and professional development workshops were mentioned by 59% [95% CI: 3.60, 7.84] of LTCs as being optimal venues for global health sustainment training. Their examples included Division ESEOs taking charge of recurring global health sustainment training and mentorship programs for Brigade ESEOs. Others mentioned Corps-level ESEOs hosting FOGHE courses at central installations with the intent of bringing together Table of Organization and Equipment-

[117] Argueza-Prince, "WaSH in Practice," 37-40.

and Table of Distribution and Allowances-assigned ESEOs. Forty-seven percent [95% CI: 2.52, 6.90] of LTCs advocated for global health sustainment training to be offered during the annual Army Public Health Conference or at similar online events on a recurring basis. Such events could allow the invitation of interagency and non-military global health experts to facilitate knowledge exchange across and beyond the AOC.

Global Health Skills, Attributes, and Competencies

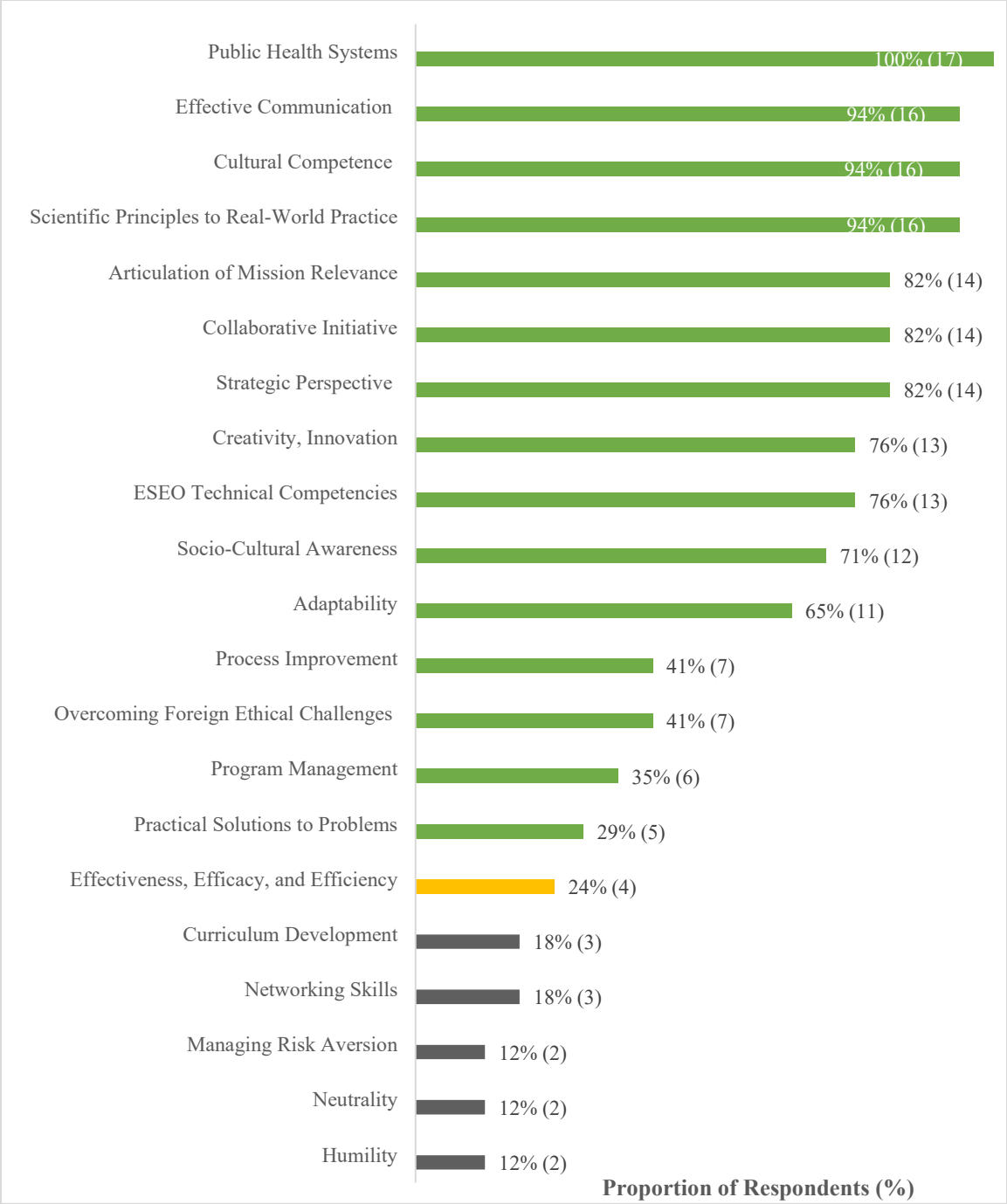
Further expanding on secondary question #3, which assesses the inclusion of global health in the training and development of ESEOs, the interviewees described the types of skills, attributes, and competencies they perceive to be the most relevant to the future success of ESEOs in WaSH GHAs. Using the Leadership Requirements Model,[118] the study established that all statistically significant responses could be broadly classified under the Intellect attribute and the Leads and Develops competencies of the Leadership Requirements Model. Of the 21 types of leader attributes, skills, and competencies noted by LTCs as most relevant, 15 were found to be statistically significant and 1 with borderline significance (see figure 5). Using the definitions of attributes and competencies in ADP 6-22 (Army Leadership and the Profession), one can infer that findings categorized within the Intellect attribute can be developed through training and leader development. However, those classified under Leads and Develops competencies

[118] The *Leadership Requirements Model* displays the foundations of selecting, developing, and evaluating Army leaders, regardless of rank. Competencies are skills that can be trained and developed, while the attributes are enduring characteristics which can be developed through experience over time. The model aligns expectations with leader development activities, personnel management practices, and systems.

may require more in-depth professional development efforts because these characteristics are honed through experience over time.[119]

Developing ESEOs' knowledge of public health systems was unanimously found to be the most critical for success in WaSH GHAs [100%, 95% CI: 8.16, 10.00]. Interviewees commented that while the focus of FHP is the application of specific technical competencies for the protection of U.S. personnel, knowledge about the social and environmental determinants of health and the socioecological framework is vital. Knowledge of systems-wide frameworks coincides with subsequent commentary about how ESEOs must view their work with a strategic perspective and understand the operational environment beyond their area of responsibility (AOR) [85%, 95% CI: 5.90, 9.38]. According to the feedback, broadening one's perspective includes a self-study into current events, national strategy, policy decisions, and staying abreast of how actions at each level of war could inform or impact their work in the global health space.

[119] Headquarters, Department of the Army (HQDA), Army Doctrine Publication (ADP) 6-22, *Army Leadership and the Profession* (Washington, DC: Government Publishing Directorate, July 2019), 1-15.



Proportion of participants' responses when asked about the type(s) of attributes, skills, and competencies most relevant to the future success of ESEOs in WaSH-related GHAs (n = 17, # participants)

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Figure 5. Attributes, Skills, and Competencies

Source: Created by author.

An ESEO's ability to execute context-specific mission analysis that includes a comprehensive consideration of causal factors, relationships, and second- and third-order effects of health threats to systems would better facilitate their success in global health. The specific finding on the knowledge of public health systems is noteworthy, as the LTC cohort's responses were consistent with the WaSH in Practice study's results that the following competencies were *greatly applied* (**) and *moderately applied* (*) by ESEOs in the ranks of 2LT to MAJ during their GHAs in WaSH.[120]

1. Global Burden of Disease Competency 1a**. Describe the major causes of DNBI and how risk varies regionally
2. Global Burden of Disease Competency 1c*. Validate the status of populations using data (e.g., public health surveillance data)
3. Social and Environmental Determinants of Health Competency 3c**. Describe the relationship between access to and quality of water, sanitation, food, and air on individual and population health
4. Ethics Competency 6b*. Demonstrate an awareness of local and national codes of ethics relevant to one's working environment
5. Strategic Analysis Competency 11c*. Conduct a situational analysis across a range of cultural, economic, and health contexts
6. Strategic Analysis Competency 11d*. Design context-specific environmental health interventions based upon situational analysis.[121]

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[120] Argueza-Prince, "WaSH in Practice," 52, 55-56; Astle et al., *CUGH Global Health Education Competencies Tool Kit.*

[121] Astle et al., *CUGH Global Health Education Competencies Tool Kit.*

Effective communication, cultural competence, and the ability to apply scientific principles to real-world contexts were named by the LTC cohort as imperative attributes, skills, and competencies [94%; 95% CI: 7.30, 9.90], followed by creativity and innovation [76%, 95% CI: 5.27, 9.04], socio-cultural awareness [71%; 95% CI: 4.69, 8.67], adaptability [65%, 95% CI: 4.13, 8.27], and the ability to overcome foreign ethical challenges [41%, 95% CI: 2.16, 6.40] (see figure 5). Observations consistently noted by the respondents are junior ESEOs' inclination to think, communicate, and execute missions in a very technical manner. Likewise, officers were observed to be biased towards Western points of view, whether in problem-framing or when developing solutions. Interviewees conveyed that while U.S. military commanders or personnel may be receptive to logical, data-driven assessments and recommendations, problems in the global health space require flexibility in the way risks, problems, or solutions are viewed or conveyed to foreign partners or populations. Several LTCs mentioned that the Western way may not always be the best way to achieve the intended effects in certain operational environments. Some indicated that empathy and humility are undervalued attributes when working with partners or populations who have had little or no exposure to the Western way of life. Thus, the ability to take one's technical knowledge and effectively communicate and apply them simply, in culturally-applicable and contextually-appropriate ways, are foundational to success in the global health space.

In line with the ability to effectively communicate with foreign partners or host nation entities, the LTC cohort stressed the development of skills required to articulate the value of global health (or public health) beyond FHP [82%; 95% CI: 5.90, 9.38], for ESEOs to remain relevant and nested with the mission at large (figure 5). Interviewees

asserted that by ESEOs having a strategic perspective and understanding public health systems, they benefit from seeing the linkages among global health stakeholders across military services, governmental organizations, NGOs, the private sector, and foreign or host-nation entities. The heightened level of awareness about primary and secondary stakeholders across their operational environment could stimulate collaboration between the ESEO and those actors, as collaborative initiative[122] is another skill identified by the LTCs as relevant to future WaSH GHAs.

Last among the statistically significant skills, attributes, and competencies are those related to the improvement of organizational processes [41%, 95% CI: 2.16, 6.40], development of practical solutions [29%, 95% CI: 1.32, 5.31], management of programs and concurrent or complementary initiatives [35%, 95% CI: 1.33, 5.31], and the evaluation of effectiveness, efficiency, and efficacy [24%, 95% CI: 0.96, 4.73] (see figure 5). As part of their conventional duties, many ESEOs are tasked to plan, implement, and evaluate programs. To be effective, especially when responsibilities extend beyond the realm of FHP, ESEOs must be able to apply project management and process improvement techniques. Several interviewees noted that public health programs should not be developed and implemented in isolation. Because many ESEOs work as subject matter experts for large organizations, even the most junior ESEOs must have the skills and attributes necessary to lead and manage personnel. Intended effects are more likely to be achieved when ESEOs can lead others beyond their warfighting function and direct influence, to achieve buy-in and collective action from all stakeholders.

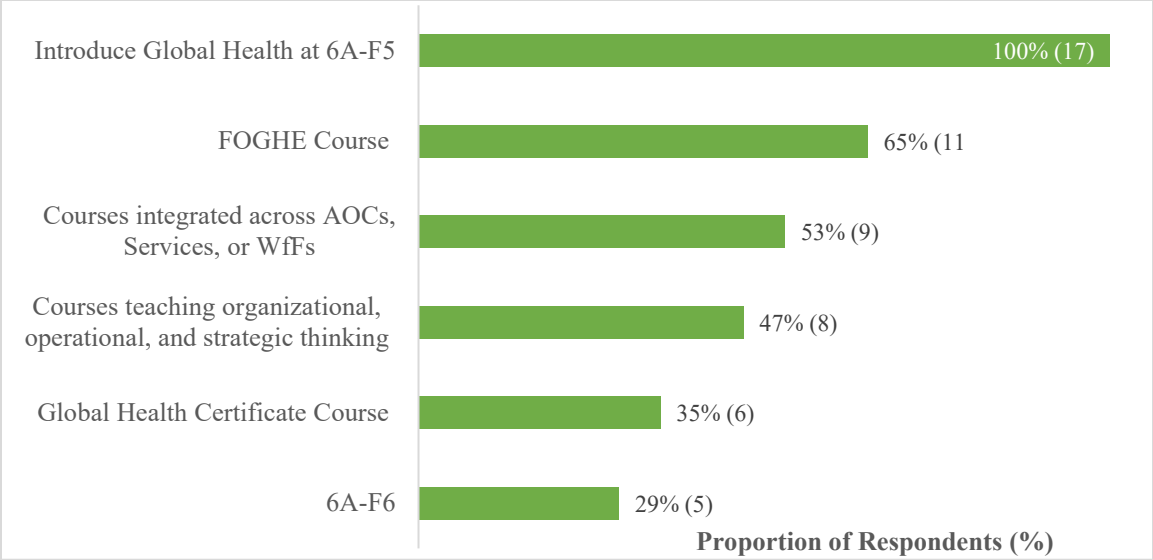
[122] *Collaborative initiative* can lead to innovation and better solutions to complex problems by encouraging the exchange of ideas across disciplines and stakeholders.

Development in the Institutional, Operational, and Self Development Domains

Secondary question #4 asked LTCs to describe what actions should be taken to develop junior ESEOs in the Institutional, Operational, and Self-Development domains. As previously mentioned, 100% of interviewees concurred that 6A-F5 [95% CI: 8.16, 10.00] should be the primary venue in the Institutional domain to introduce global health concepts to junior ESEOs (see figure 4 and figure 6). They added that sustainment training at already-established courses should be leveraged to reinforce competencies as ESEOs progress in their careers and diverge in career paths and experiences. The courses which were identified as having statistical significance were the FOGHE and the Global Health Certificate offered by USUHS, the parent organization of the Center for Global Health Engagement.

While the interviewees mentioned the long-term benefit of including global health material in courses that are integrated across AOCs, Services, or warfighting functions (e.g., MEDCoE Officer Advanced Course, Joint Medical Operations Course, Command and General Staff Officer Course), the low attendance rates of ESEOs or rank requirements for these types of courses may not offer significant benefits to the most junior ESEOs who were identified as having the highest odds of executing GHAs in WaSH.[123]

[123] Argueza-Prince, "WaSH in Practice," 43.



Proportion of participants' responses when asked what types of training and/or leader development actions within the Institutional domain would facilitate junior ESEOs' success in Global Health practice (n = 17, # participants)

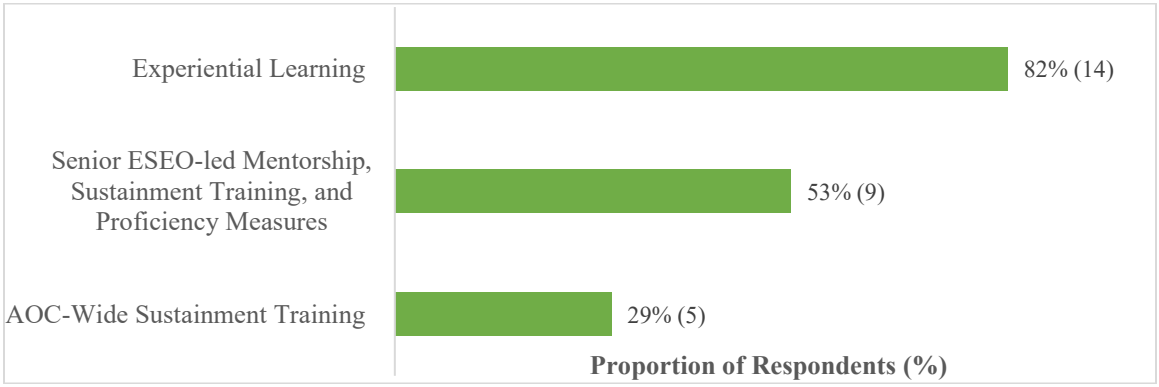
Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Figure 6. Institutional Domain: Training and Leader Development for Successful Global Health Practice

Source: Created by author.

Inductive memoing and coding revealed three broad themes about the actions that should be taken in the Operational domain to prepare junior ESEOs for GHAs in WaSH (see figure 7). Interviewees cited the facilitation of experiential learning [82%, 95% CI: 5.90, 9.38] as the most relevant action that should be taken to develop junior ESEOs to become effective global health practitioners. "Learning by doing" was the message echoed by several interviewees when they relayed the importance of ensuring that ESEOs gain proficiency through repetition and equitable exposure. The interviews revealed that talent management is vital to ensuring that all junior ESEOs receive maximum exposure and experience in applying global health competencies. Talent can be managed through

senior ESEOs' engagement in the assignments process, during personnel selection for manning global health-related taskings, and when assessing who should participate in training or knowledge exchange exercises where junior ESEOs can practice global health in relatively low-risk settings.



Proportion of participants' responses when asked what types of training or actions within the Operational domain would facilitate junior ESEOs' success in Global Health practice (n = 17, # participants)

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Figure 7. Operational Domain: Training and Leader Development for Successful Global Health Practice

Source: Created by author.

Another action in the Operational domain that could improve global health practice is the inclusion of global health topics in senior ESEO-led mentorship initiatives [53%, 95% CI: 3.10, 7.38] (see figure 7). Interviewees conveyed that senior ESEOs should facilitate sustainment training as part of the AOC's mentorship programs. Two interviewees added that like other sustainment training, proficiency on global health competencies should be measurable. Unit training plans should include competency evaluations for junior ESEOs. Senior ESEOs could facilitate these evaluations because

they can influence subordinate training plans and have better insight into unit training priorities and upcoming missions where global health could be potentially employed.

Going beyond senior ESEO-led mentorship and sustainment training, 29% of interviewees discussed the value of having a recurring AOC-wide sustainment training event [95% CI: 1.33, 5.31]. Most of the feedback mentioned the Army Public Health Conference as a prime venue. Others remarked about the benefit of hosting regular sustainment training in an online environment. Remote training would be more cost-effective and could occur more frequently than the Army Public Health Conference. Finally, interviewees noted that the advantage of hosting AOC-wide sustainment training is the ability for all ESEOs to exchange knowledge about their global health experiences in a single, recurring forum. During these events, subject matter experts can present modern, emerging material that could enhance global health practice in the Army.

Inductive analysis found six statistically significant themes in the Self-Development domain (see figure 8). Seventy-one percent of the LTC cohort conveyed that junior ESEOs should seek ways to improve their communication skills [95% CI: 4.69, 8.67]. Their recommendations included enrolling in Centers of Excellence instructor courses, attending courses in health risk communication, taking advantage of public speaking opportunities (e.g., teaching, briefing senior leaders), and self-study into how to communicate effectively with individuals in positions of authority or persons from different cultures. Developing communication skills through self-development aligns strongly with a previous assertion that effective communication is one of the critical attributes necessary to succeed in executing GHAs (see figure 5 and figure 8).

Proportion of participants' responses when asked what types of training or actions within the Self-Development domain would facilitate junior ESEOs' success in Global Health practice
(n = 17, # participants)

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Figure 8. Self-Development Domain: Training and Leader Development for Successful Global Health Practice

Source: Created by author.

Fifty-three percent of LTCs stated that junior ESEOs should pursue global health education in non-military learning institutions [95% CI: 3:10, 7.38] (see figure 8). Some reasoned that while there are opportunities like the FOGHE course and the USUHS Global Health Certificate to learn about global health in a military education setting, many civilian institutions offer robust opportunities, including exposure to the multitude of public health disciplines that overlap with or enable global health (e.g., Health Policy, Population Health, Epidemiology, Health Behavior). Twenty-nine percent [95% CI: 1.33,

5.31] of respondents also recommended that junior ESEOs find ways to experience or understand how non-military public health stakeholders (e.g., The World Health Organization, USAID, CDC) practice global health. While ESEOs do not typically pursue the Long Term Health Education and Training Program until they are mid-grade to senior O-3s or higher, there are opportunities to enroll in free online global health courses. Such courses are currently offered by The World Health Organization's Human Security Learning Platform, Harvard University, University of Oxford Global Health Training Centre, and the University of Washington's Department of Global Health.

Self-study should not be limited to health-specific courses. The LTC cohort noted that junior ESEOs should have a practical understanding of national and strategic policies that could impact public health, DOD strategic guidance, and emerging or ongoing issues that affect global health systems (e.g., regional power dynamics). Finally, 29% [95% CI: 1.33, 5.31] of interviewees emphasized that junior ESEOs should seek to improve their cultural awareness and cultural competence by finding ways to immerse themselves in a variety of cultures and ways of thinking.

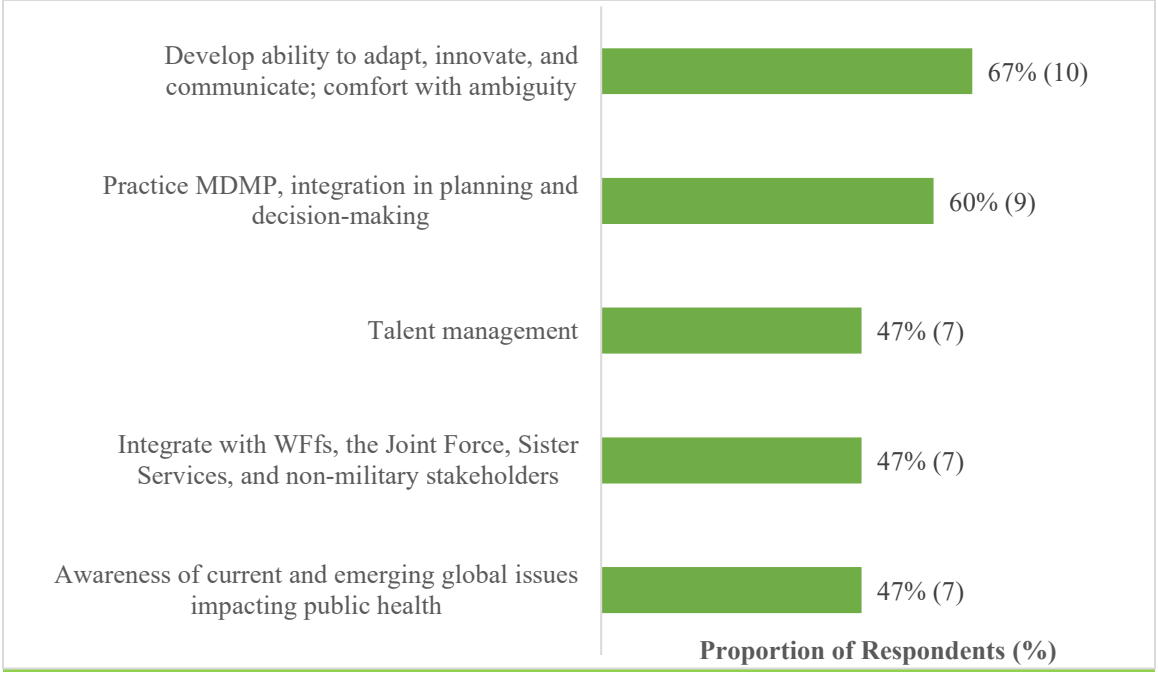
Developing Junior ESEOs for Multi-Domain Operations

When asked how ESEOs can be developed to best support MDO, 5 statistically significant themes emerged from the narratives of 15 LTCs (see figure 9). Two respondents' narratives for this specific question in the interview were excluded from analysis due to inconsistent understanding of MDO, as defined in U.S. Army Training

and Doctrine Command (TRADOC) Pamphlet 525-3-1.[124]. Most of the thematic evidence from the MDO portion of the analysis was consistent with previous findings about the types of skills, attributes, and competencies necessary for junior ESEOs' success in WaSH GHAs (see figure 5).

The most salient finding is the development of junior ESEOs' ability to adapt, innovate, and communicate in the global health space [67%, 95% CI: 4.17, 8.48]. Interviewees noted that ESEOs must develop confidence when operating in uncertain situations. Commanders may make decisions expediently, using the limited information they have on-hand. Junior ESEOs must be able to effectively assist the commander's decision-making process by presenting coherent assessments of risk to forces and practical solutions. These actions must sometimes be executed without the ESEO having a complete picture of the operating environment. Thus, Junior ESEOs must hone the attributes of adaptability and innovation and the skills to effectively communicate to support the commander's decision-making process in complex and often ambiguous contexts, which are expected to be the norm in MDO.

[124] U.S. Army Training and Doctrine Command (TRADOC), TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028* (Fort Eustis, VA: TRADOC, December 6, 2018).



Proportion of participants' responses when asked how can ESEOs be developed to best support MDO (n = 15, # participants)

**Note: Two participant narratives omitted due to inconsistent understanding of MDO*

Statistically Significant 95% CI upper and lower limits < or > null value of 1	**Borderline Significance** 95% CI upper or lower limits within 0.05 of the null value	**Not Statistically Significant** 95% CI upper or lower limits cross the null value of 1

Figure 9. Developing Junior ESEOs for Multi-Domain Operations

Source: Created by author.

Previous findings on integration and interoperability overlap with the next theme, which focuses on the integration of global health considerations in staff planning processes and commanders' decision-making. The LTC cohort remarked that integration could be achieved by ESEOs partaking in unit staff planning and military decision-making processes (MDMP) [60%; 95% CI: 3.58, 8.02]. Because the ESEOs who have the highest odds of participating in WaSH GHAs are lieutenants,[125] the integration of junior

[125] Argueza-Prince, "WaSH in Practice," 37-40.

ESEOs in the MDMP may require the engagement of senior ESEOs who serve at higher echelons of the organizations that junior ESEOs are assigned to. The inference is also consistent with the recommended actions that should be taken in the Operational domain, which emphasized the need to facilitate experiential learning [82%, 95% CI: 5.90, 9.38] to ensure that junior ESEOs gain proficiency through repetition and equitable exposure (see figure 7).

Again, talent management was a consistent theme, not only in the current study, but in the recommendations from the 2020 WaSH in Practice Study, which derived its feedback directly from ESEOs in the ranks of 2LT-MAJ. The WaSH in Practice study asserted that assignments with a projected global health component (e.g., deployments consisting of Mil-Mil or Mil-Civ operations) should be manned by ESEOs with the appropriate academic background and experiences.[126] This recommendation ties directly to AOC-wide talent management efforts, which 47% [95% CI: 2.48, 6.99] of LTCs noted as critical to junior ESEOs success when tasked to conduct WaSH GHAs. An example discussed by one respondent is that when the Assignment Interactive Module 2.0 (AIM 2.0) marketplace becomes available to match junior officers to brigades, senior ESEOs who have insight into those brigades' upcoming missions should assist unit strength managers in advertising the appropriate knowledge, skills, and behavior indicators on AIM 2.0. They commented that senior ESEOs should make themselves available to assist potential, incoming ESEOs in making the best decisions during the assignments process. Another interviewee remarked that mentors and branch managers should advise ESEOs

[126] Argueza-Prince, "WaSH in Practice," 60-61.

on how to diversify their career paths, noting that success in MDO will demand an increase in global health-related sustainment training early on in a junior ESEO's career.

Because MDO requires the consideration of adversaries' strategies across multiple domains, the future success of ESEOs in executing WaSH GHAs are predicated on their ability to integrate with other warfighting functions, the Joint Force, other military services, and at times, non-military stakeholders operating in the global health space (see figure 9). This coincides with the theme in which all 17 interviewees concurred that an extensive knowledge of public health systems is the most relevant competency [100%, 95% CI: 8.16, 10.00], followed by the finding that ESEOs must view their work with a strategic perspective and an understanding of the operational environment beyond their typical AOR [85%, 95% CI: 5.90, 9.38] (see figure 5). The study, however, found that opportunities for such integration are not practical in the Institutional domain (see figure 6), other than in the attendance of the FOGHE course or the Global Health Certificate from USUHS, because most of the courses that could potentially include global health-related topics have specific rank or assignment requirements. The integration is more practical in the Operational domain, as many experiential learning opportunities offer flexibility on the rank requirements for junior ESEOs (e.g., taskings, temporary duty missions, deployments).

Effective integration with the stakeholders of a global health system requires an understanding of current and emerging global issues and how they impact the system at large from a public health perspective [47%, 95% CI: 2.48, 6.99]. In light of the COVID-19 pandemic, it is even more imperative for junior ESEOs to understand how their niche

in FHP can positively contribute to their organizations' readiness in the face of MDO and potentially expand their missions’ relevance beyond their immediate area of influence.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Summary of the Secondary Research Questions

Question 1

The scoping literature review established that the global environment has evolved to be increasingly complex and interconnected. The ongoing COVID-19 pandemic demonstrates that once-isolated threats can upend the Nation's interests and security in a short span of time. Emerging diseases, natural and man-made disasters, fluctuating environmental conditions, global power dynamics, and new strategic guidance, directives, and policies are just some factors that impact the roles and responsibilities of ESEOs.

Pertinent to secondary question 1, the military global health community presented several recommendations, many of which are actionable in the short-term to help drive the modernization of the AOC's public health practice. Foremost is the need to acknowledge that global health is the overarching public health discipline that establishes the relationship between most, if not all, the critical public health tasks performed by the ESEO in the operational context. Experts in global health and military medicine recommend that current programs of instruction like 6A-F5 should be aligned with the DOD's strategic priorities and future needs in the global health space.[127]

Singular stakeholders can no longer bear the burden of public health threats. The complexity of today's problems requires extensive stakeholder integration and

[127] Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

interoperability.[128] Junior ESEOs must demonstrate the initiative to effectively leverage their skills, attributes, and competencies to achieve integration and interoperability across warfighting functions, services, and partners.

Finally, the literature review established that in the short-term, global health efforts and leader development programs should focus on areas where the military has achieved success and demonstrated well-evidenced strengths. The ESEO community can examine lessons from the U.S. and international community's efforts in responding to recent global health threats like the EVD epidemic in West Africa[129] or COVID-19. The community can also seek to further understand which specific areas of WaSH have ESEOs been most successful in the last ten years. In the Leadership and Education domain, leaders can begin coordinating equitable opportunities for ESEOs to practice global health competencies in low-risk settings, as they concurrently develop their organizations' leader development programs to focus on global health-related topics.[130]

Question 2

In examining the differences between the global health experiences of 2LT-MAJs versus LTCs, the study found evidence to infer that experiences in WaSH GHAs are relatively consistent across both cohorts. The WaSH competencies used by junior ESEOs

[128] Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43; Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44; Nang and Martin, "Global Health Diplomacy," 1456-1460.

[129] Quinnan, "The Future of Department of Defense Global Health Engagement," 37-44.

[130] Argueza-Prince, "WaSH in Practice," 57.

in FHP coincide with the competencies required to execute WaSH GHAs with host or partner nations, namely in community-level activities, which were found to be the most predominant across the five levels of the Socioecological Model Framework. Because the results between both cohorts coincide at a quantitative and qualitative level, there is sufficient evidence to validate that recommendations from the LTC cohort regarding the training and development of junior ESEOs are generalizable to those in the ranks of 2LT-MAJ.

Question 3

The LTC cohort's assessment about the inclusion of global health in the training and development of ESEOs coincides with the literature review finding that existing courses should be optimized per the results of the 2020 WaSH in Practice study, which outlined the competencies that junior ESEOs *greatly applied* and *moderately applied* in their WaSH GHAs.[131] Concurrently, the types of actions they recommended that should be taken with the future challenges of MDO in mind, yielded themes (see figure 9) consistent with the skills, attributes, and competencies outlined in figure 5. The concordance of the recommended actions in both the general global health context and in MDO supports the assertion that the skills, attributes, and competencies found to be statistically significant in this study are relevant to the universal practice of global health in WaSH by junior ESEOs.

[131] Argueza-Prince, "WaSH in Practice," 52-55; Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

Expanding on the inclusion of global health as it pertains to WaSH, the LTC cohort provided their recommendations on the types of training courses, venues, and ideas about where global health topics should be included. All agreed that 6A-F5 is the prime venue for introducing global health competencies. However, sustainment training in various settings is necessary to ensure that junior ESEOs receive equitable preparation for future global health practice. Their ideas primarily included already-established courses like the FOGHE and the Global Health Certificate offered by the USUHS. They added that senior ESEOs have a critical role in facilitating leader development programs that include global health-related material, low-risk experiential learning opportunities, and competency validation.

In line with the inference that global health is the overarching discipline that integrates multiple aspects of public health, the LTC cohort unanimously concurred that knowledge of public health systems is the most relevant competency that a junior ESEO should have in order to succeed in WaSH GHAs. Their feedback included significant commentary about the importance of self-study into current events, national strategy, policy decisions, and actions at each level of war that may impact the global health space. Because only 27% of junior ESEOs reported entering the 72D AOC with a CEPH-accredited degree, the formal inclusion of public health systems concepts at 6A-F5 becomes even more critical.

Question 4

While the formal inclusion of global health in the Institutional domain was well-articulated in the LTCs' feedback, the skills, attributes, and competencies described as being of critical importance to junior ESEO development require extensive integration

with the training and development actions taken in the Operational and Self-Development domains. The competency of understanding public health systems, for example, can be taught at 6A-F5 using concepts like the Socioecological Model Framework and the systems perspective of the operational environment in JP 2-01.3. However, the LTCs emphasized that for junior officers to succeed in GHAs, they must practice applying these systems-thinking concepts to real-world problems and operational contexts. Experiences like food and water risk assessments with other military services, for example, is one low-risk opportunity to practice WaSH competencies before deploying to support security and stability missions in highly-kinetic areas of operation.

These experiential learning opportunities require engaged organizational leaders and mentors. Senior ESEO-led sustainment training, mentorship, and proficiency measures would wholly reinforce gains in the Institutional and Operational domains. Due to the low-density nature of the AOC, it is even more imperative that junior ESEOs are networked with and mentored by higher echelon ESEOs across organizations and installations. These networks have the potential to facilitate global health-related dialogue and knowledge exchange, as global health (or public health) competencies are rarely integrated into non-medical unit training plans.

The LTC cohort recommended a variety of modalities for self-study and self-improvement. The ability of junior ESEOs to effectively communicate with senior leaders, people of different cultures, and non-military stakeholders was noted as a highly essential skill for junior ESEOs. Participants repeatedly commented that while junior ESEOs' technical knowledge and competence are unmatched across a range of AMEDD technical specialties, many lack the skills necessary to successfully convey the relevance

of their assessments, recommendations, and even their own value to their organizations. Poor communication style, relying solely on a Western-centric perspective, inability to formulate practical messages to a lay population, and deficient cultural competence are the most significant barriers that ESEOs face when communicating with senior leaders. They are also hindered by these when implementing their initiatives among non-U.S. military stakeholders. Coinciding with the need to improve on public health systems competencies, making the linkages between these systems and conveying messages appropriate to the operational and cultural context are crucial to the execution of WaSH GHAs across the global health space.

Conclusions

The primary research question asked what actions should be taken in the academic training and professional development of ESEOs to better prepare junior officers in the modern practice of global health. The insights learned from each of the aforementioned secondary questions yielded significant quantitative and qualitative evidence to answer the primary question. They also substantiate timely changes to the modernization of the 72D AOC across the Institutional, Operational, and Self-Development domains.

In recent years, senior ESEOs have advocated for the realignment of the 72D AOC with future Joint and interagency requirements. Similarly, there is a call to leverage the talent of ESEOs across organizations and missions of the Joint Force, interagency, and international public health stakeholders using their existing FHP competencies. ESEOs are one of the only AOCs uniquely trained by functional specialty to fulfill Joint public health requirements. Counter to a DCR finding that MHS personnel lack

preparedness for conducting missions in the civilian-military environment, ESEOs proved relatively successful in their global health missions despite the global health discipline not being formally recognized as a function of their AOC.[132]

Amid the DOD's efforts to adapt and respond to the ongoing COVID-19 pandemic, a new lens is necessary to examine the relevance of the 72D AOC. Across Army Medicine, global health is the only systems-focused discipline with the potential to encompass the requirements of the ROMO and the interdisciplinary and interconnected context of today's public health challenges. Being one of the first studies of its kind to capture the specific nuances of the ESEO community in the global health space, these findings present a timely opportunity to refocus the training and development priorities of the 72D AOC. The overall outcome of this study sets a precedent for initiating the evidence-based cultivation of future global health practitioners in the 72D AOC.

Recommendations

The study's outcomes offer robust insights into the potential for modernization in the 72D AOC. To catalyze the institutionalization of global health as a discipline of practice by ESEOs, this study must gain the attention of leaders across Army Medicine, warfighting functions, the Joint Force, interagency organizations, and the global health community. Peer-review and presenting the outcomes of this study in an AOC-wide forum like the annual Army Public Health Conference would provide an audience with the 72D Consultant to the Surgeon General, ESEOs of all ranks, and Army Medicine at

[132] Licina, Cogswell, and Paz, "Establishing a Predictable Military Global Health Engagement Funding Authority," 1397-1398; Licina, Rufolo, and Story, "Priorities for a 21st-Century Defense," 38-43.

large. Listed below are the actionable recommendations for the development of modern global health practitioners among today's junior ESEOs.

1. Formalize global health as a discipline of practice in the 72D AOC
2. Optimize 6A-F5 to introduce global health concepts per the Priority I and II list of competencies recommended in the 2020 WaSH in Practice study.[133]
3. Develop and provide a consolidated list and descriptions of WaSH GHA-related skills, attributes, and competencies to all 72Ds to help guide mentorship and self-development
4. Support pursuance of training and professional development opportunities across Institutional, Operational, and Self-Development domains that focus on WaSH and global health-related topics, attributes, skills, and competencies
5. Approve a global health additional skill identifier (ASI) for those who have earned a qualifying certificate (e.g., graduate-level global health certificate) or demonstrated having gained the competencies and skillset of a global health practitioner; utilize ASI for talent management efforts
6. Develop or provide recurring sustainment training events with options for in-person and remote participation
7. Provide opportunities for low-risk practice of WaSH competencies before junior ESEOs deploy to more complex or kinetic operational environments

[133] Argueza-Prince, "WaSH in Practice," 55-56.

8. Conduct a study on the scope and effects of GHAs in WaSH to focus training and development efforts on ESEO-specific areas of improvement; base training and development efforts on evidence from the field
9. Implement reportable measures of effectiveness and measures of performance for WaSH GHAs
10. Conduct a gap analysis study in WaSH GHAs for the other DOTMLPF-P domains that were not assessed in-depth by this study
11. Pursue the integration and interoperability of ESEO roles and functions into other warfighting functions and services. Seek opportunities for junior ESEOs to experience working in Joint assignments, with governmental agencies (e.g., USAID, Department of State), and with other global health stakeholders
12. Stimulate senior leader engagement in the Army Talent Alignment Process; ensure that assignments on the AIM 2.0 marketplace which have a global health component are advertised with the appropriate knowledge and skills indicators for global health

Future Studies

Unlike the 2020 WaSH in Practice study, the delimitations placed on the LTC cohort's study design prevented the collection of data that describes their WaSH activities by-year and duration. While the WaSH in Practice study was able to assert that there is an upward trend of GHAs in WaSH in the last four years, the current study was unable to compare the LTC cohort's trends in GHAs over time. Likewise, the study was delimited on describing the duration, geographic location, and conditions of WaSH activities conducted by ESEOs currently in the rank of LTC. The investigator determined that some

of these descriptive factors were less critical to the study because the statistical analysis in the previous study of 2LT-MAJ ESEOs was inconclusive for the duration of WaSH activities. However, there may be some future benefit in describing the types of WaSH activities conducted at various geographic locations and conditions and comparing their outcomes.

This study design did not ascertain the senior ESEO cohort's assessment of junior ESEOs' performance and effectiveness in specific types of WaSH GHAs. In the future, measures to determine what types of WaSH GHAs junior ESEOs perform well or most effectively may provide better insight into the kinds of competencies, skills, or attributes that need to be prioritized for their professional development.

Because the results of this study are only generalizable to the professional training and development of Active Duty ESEOs, the 72D AOC may benefit from exploring whether there are any quantitative and qualitative differences between the GHAs conducted by Active Duty ESEOs and those in other components. Future professional development could also be enhanced by exploring how other U.S. military services execute GHAs, especially those with dedicated officers who specialize in global health.

When asked about the actions that should be taken in the academic and professional development of ESEOs to better prepare junior officers for the modern practice of global health, the study participants were generally more inclined to respond with junior officer development in mind. Further studies on the topic could focus on what training and professional development are required for senior officers, as they lead and mentor the future generation of global health practitioners in the 72D AOC.

BIBLIOGRAPHY

Addy, Nii, Alain Poirier, Chantal Blouin, Nick Drager, and Laurette Dube. "Whole-of-Society Approach for Public Health Policymaking: A Case Study of Polycentric Governance from Quebec, Canada." *Annals of the New York Academy of Sciences* 1331, no. 1 (2014): 216-229. 10.1111/nyas.12503.

Argueza-Prince, Christine. "WaSH in Practice: Evidence and Themes from the Global Health Activities of Environmental Science and Engineering Officers." Master's thesis, University of North Carolina Chapel Hill, 2020. University Libraries Digital Repository.

Assistant Secretary of Defense for Health Affairs (OASDHA). "Overview of the Department of Defense's Military Health System." Fact Sheet, OASDHA, Falls Church, VA. Accessed January 22, 2021. https://archive.defense.gov/home/features/2014/0614_healthreview/docs/Fact_Sheet_Overview.PDF.

Astle, Barbara, Carlos A. Faerron Guzman, Ayla Landry, LaHoma S. Romocki, and Jessica Evert, eds. *CUGH Global Health Education Competencies Tool Kit.* 2nd ed. Washington, DC: Consortium of University for Global Health, Competency Sub-Committee, 2018.

Belmont Jr., Philip J., Gens P. Goodman, Brian Waterman, Kent DeZee, Rob Burks, and Brett D. Owens. "Disease and Nonbattle Injuries Sustained by a U.S. Army Brigade Combat Team During Operation Iraqi Freedom." *Military Medicine* 175, no. 7 (July 2010): 469-476. 10.7205/milmed-d-10-00041.

Brueggemeyer, Mary. "Force Health Protection." In *Fundamentals of Military Medicine*, by Francis G. O'Connor, Eric B. Schoomaker, and Dale C. Smith, 234. Fort Sam Houston: Borden Institute, Office of the Surgeon General, U.S. Army Medical Center of Excellence, 2019.

Burkett, Edwin K., and Gerald V. Quinnan Jr. "Global Health and the U.S. Department of Defense: A Call for an Evidence Base." *Military Medicine* 180, no. 11 (2015): 1114-1115.

Burkle Jr., Frederick M. "Throwing the Baby Out with the Bathwater: Can the Military's Role in Global Health Crises be Redeemed?" *Prehospital and Disaster Medicine* 8, no. 3 (2013): 197-199.

Cecchine, Gary, Forrest E. Morgan, Michael A. Wermuth, Timothy Jackson, Agnes Gereben Shaefer, and Matthew Stafford. *The U.S. Military Response to the 2010 Haiti Earthquake: Considerations for Army Leaders.* Washington, DC: Rand Corporation, 2013.

Center for Army Lessons Learned (CALL). CALL Handbook No. 17-03, *Theater Security Cooperation: The Military Engagement Team.* Fort Leavenworth, KS: U.S. Army Combined Arms Center, January 2017.

Center for Nonprofit Excellence. "Collaborative Initiatives and Effectiveness." New Mexico Association of Grant Makers. August 24, 2016. https://www.centerfornonprofitexcellence.org/.

Chairman of the Joint Chiefs of Staff. Joint Publication 3-07, *Stability.* Washington, DC: Joint Chiefs of Staff, August 2016.

Council on Education for Public Health. "Accreditation Criteria." October 2016. https://ceph.org/about/org-info/criteria-procedures-documents/criteria-procedures/2021-revisions-criteria/.

Cullison, Thomas R, Charles W. Beadling, and Elizabeth Erickson. "Global Health Engagement: A Military Medicine Core Competency." *Joint Force Quarterly* 80, no. 1 (2016): 54-61. https://ndupress.ndu.edu/JFQ/Joint-Force-Quarterly-80/Article/643102/global-health-engagement-a-military-medicine-core-competency/.

Gavel, Doug. "Analysis and Opinions: Joseph Nye on Smart Power." Harvard Kennedy School Belfer Center. July 3, 2008. https://www.belfercenter.org/publication/joseph-nye-smart-power.

Gertsman, Burt B. *Basic Biostatistics for Public Health Practice.* 2nd ed. San Jose: Jones and Bartlett Learning, LLC, 2015.

Golden, Shelley, and Jo Anne Earp. "Social Ecological Approaches to Individuals and Their Contexts: Twenty Years of Health Education and Behavior Health Promotion Interventions." *Health Education and Behavior* 39, no. 3 (2012): 364-372.

Gostin, Lawrence. "Global Health." In *Global Health Law,* 22, 61-68. London: Harvard University Press, 2014.

Grill, Beth, Michael J. McNerney, Jeremy Boback, Renanah Miles, Cynthia Clapp-Wincek, and David E. Thaler. *Follow the Money: Promoting Greater Transparency in the Department of Defense Security Cooperation Reporting.* Santa Monica, CA: Rand Corporation, 2017.

Headquarters Department of the Army. Army Doctrine Publication 6-22, *Army Leadership and the Profession.* Washington, DC: Government Publishing Directorate, July 2019.

———. Army Regulation 351-3, *Professional Education and Training Programs of the Army Medical Department*. Washington DC: Government Publishing Directorate, October 2007.

Hussain, Fazal, and Antonio Delgado. "Quantification of Global Health Impact." *Military Medicine* 15, no. 11-12 (2020): 467-468. https://doi.org/10.1093/milmed/usaa191.

Institute for Security Governance. "Institutional Capacity Building: An Essential Component of Full Spectrum Capability Development." Defense Security Cooperation Agency. Accessed 20 March 2020. https://instituteforsecuritygovernance.org/icb-smart-sheets.

Jarrett, Elizabeth. "Whole-of-Government Approach: What it Means and How it Translates to Improving National Health Security." *National Health Security Strategy* (blog). *U.S. Department of Health and Human Services,* February 6, 2019. https://www.phe.gov/ASPRBlog/Lists/Posts/Post.aspx?ID=329.

Koplan, Jeffrey P., Christopher T. Bond, Michael H. Merson, Srinath K. Reddy, Mario Henry Rodriguez, Nelson K. Sewankambo, and Judith N. Wasserheit. "Towards a Common Definition of Global Health." *The Lancet* 373, no. 9676 (2009): 1993-1995.

Leischow, Scott J., Allan Best, William M. Trochim, Pamela I. Clark, Richard S. Gallagher, Stephen E. Marcus, and Eva Matthews. "Systems Thinking to Improve the Public's Health." *American Journal of Preventive Medicine* 35, no. 2 (2008): 196-203.

Licina, Derek. "The Military Sector's Role in Global Health: Historical Context and Future Direction." *Global Health Governance* 6 (2012): 1-30.

———. "Hospital ships adrift? Part 1: A Systematic Literature Review Characterizing US Navy Hospital Ship Humanitarian and Disaster Response, 2004-2012." *Prehospital and Disaster Medicine* 28, no. 3 (2013): 230-238.

Licina, Derek, Brad Cogswell, and Richard Paz. "Establishing a Predictable Military Global Health Engagement Funding Authority: Supporting Theater Security Cooperation Objectives and Generating Military Medical Readiness." *Military Medicine* 181, no. 11 (2016): 1397-1398.

Licina, Derek, Dennis Rufolo, and Mike Story. "Priorities for a 21st-Century Defense: Aligning U.S. Army Environmental Science and Engineering Officer Resources with the Department of Defense Strategic Guidance." *Journal of Special Operations Medicine* 13 (2013): 38-43.

Marquis, Jefferson, Jennifer D.P. Moroney, Justin Beck, Derek Eaton, Scott Hiromoto, David R. Howell, Janet Lewis, Charlotte Lynch, Michael J. Neumann, Cathryn Quantic Thurston. *Developing an Army Strategy for Building Partner Capacity for Stability Operations*. Santa Monica, CA: Rand Corporation, 2010.

Mattis, James N. "Nations with Allies Thrive, Nations without Allies Wither." Interview by Steve Inskeep and Greg Myre. *Morning Edition* podcast on *National Public Radio.* September 02, 2019. https://www.npr.org/2019/09/02/756681750/jim-mattis-nations-with-allies-thrive-nations-without-allies-wither.

———. "Remarks by Secretary Mattis on the National Defense Strategy." U.S. Department of Defense. January 19, 2018. https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1420042/remarks-by-secretary-mattis-on-the-national-defense-strategy/.

Michaud, Josh, and Jennifer Kates. "Global Health Diplomacy: Advancing Foreign Policy and Global Health Interests ." *Global Health: Science and Practice* 1, no. 1 (2013): 24-28.

Murphy, Sean. "Military Health Engagement—Lest We Forget." *Military Medicine* 176, no. 9 (2011): 967–971.

Nang, Roberto N, and Keith Martin. "Global Health Diplomacy: A New Strategic Defense Pillar." *Military Medicine* 182, no. 1 (2017): 1456-1460.

Neel, Spurgeon. "The Medical Role in Army Stability Operations." *Military Medicine* 132, no. 8 (1967): 605-608.

Nye Jr., Joseph S. "Obama's Smart Power." *New Perspectives Quarterly* 26 (2008): 7-9.

Office of Coordination of Humanitarian Affairs. "OCHA on Message: Humanitarian Principles." United Nations, June 2012. Accessed: November 22, 2020. https://www.unocha.org/sites/dms/Documents/OOM-humanitarianprinciples_eng_June12.pdf.

Office of Global Affairs. "Global Health Diplomacy." U.S. Department of Health and Human Services. Accessed April 22, 2021. https://www.hhs.gov/about/agencies/oga/global-health-diplomacy/index.html.

Office of the Secretary of Defense. *Fiscal Year (FY) 2021 President's Budget: Justification for Security Cooperation Program and Activity Funding*. Revision 1. Washington, DC: Department of Defense, April 2020. Accessed May 1, 2021. https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/fy2021_Security_Cooperation_Book_FINAL.pdf.

Office of the Under Secretary of Defense for Policy. Department of Defense Instruction 2000.30, *Global Health Engagement (GHE) Activities.* Washington DC: Department of Defense, July 2017.

Providence, Bertram C., Derek Licina, and Andrew Leiendecker. "Increasing Partner Nation Capacity Through Global Health Engagement." *Joint Forces Quarterly* 87, no. 4 (2017): 64-68.

Quinnan Jr., Gerald V. "The Future of Department of Defense Global Health Engagement." *Joint Force Quarterly* 80, no. 1 (2016): 37-44.

Sanderson, David, and Anshu Sharma. "World Disasters Report - Resilience: Saving Lives Today, Investing For Tomorrow, Chapter 1." International Federation of the Red Cross and Red Crescent Societies, 2016. https://media.ifrc.org/ifrc/wp-content/uploads/2016/11/WDR-2016-FINAL_web.pdf.

Secretary of Defense. *Summary of the 2018 National Defense Strategy of the United States of America: Strengthening the American Military's Competitive Edge*. Washington, DC: Department of Defense, January 19, 2018.

———. *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense.* Washington, DC: Department of Defense, January 3, 2012. https://archive.defense.gov/news/Defense_Strategic_Guidance.pdf.

Shelton, James D. "Evidence-Based Public Health: Not Only Whether it Works, But How it Can Be Made to Work Practicably at Scale." *Global Health: Science and Practice* 2, no. 3 (2014): 253-258.

U.S. Army Medical Service Corps. "U.S. Army Medical Department (AMEDD)." U.S. Army. Accessed March 3, 2020. https://medicalservicecorps.amedd.army.mil/careers.html#72D.

U.S. Army Training and Doctrine Command (TRADOC). TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028.* Fort Eustis, VA: TRADOC, December 6, 2018.

Violence Prevention. "The Social-Ecological Model." Centers for Disease Control and Prevention. Accessed April 26, 2021. https://www.cdc.gov/violenceprevention/about/social-ecologicalmodel.html.

Wojcik, Barbara E., Rebecca J. Humphrey, Bogdan Czejdo, and Harrison Hassell. "U.S. Army Disease and Nonbattle Injury Model, Refined in Afghanistan and Iraq." *Military Medicine* 173, no. 9 (2008): 825-835.