The Military Sector's Role in Global Health: Historical Context and Future Direction

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The military sector's role in global health has gained visibility in recent years following its disaster responses to the South Asian Tsunami of 2004 and the earthquake that hit Haiti in 2010, in addition to humanitarian assistance activities conducted throughout the world. What is less clear is the overall contribution of the military sector to global health outcomes through direct and indirect investments. These investments range from medical research and development to peacekeeping operations while providing normative, technical assistance, and coordinating roles. Focusing efforts where required, as identified in international agreements such as the Geneva Conventions, and expanding multilateral organizations (e.g., the International Congresses of Military Medicine and Global Uniformed Services Task Force) may improve near term efficiencies. A collective international military global health financing mechanism to support these efforts is also necessary. Through further enhancement of existing structures, the military sector's current role can become more efficient and effective in supporting the global good. The health and security of individuals and states throughout the world deserve nothing less.

INTRODUCTION

The international military sector's role in global health has a long and dynamic history. Early direct investments in health were made to maintain the fighting strength of military forces to defend their nations and expand the reach of their governments. Individuals within the military sector, both medical and non-medical, have shaped the global health environment. Military medical personnel gave rise to the concept of the International Red Cross and led efforts to combat tropical diseases such as yellow fever and malaria.[1,2,3] Military leaders would go on to work in the diplomacy arena and conceptualize the Marshall Plan while others serve as the President of the World Bank, arguably having the greatest influence in the development arena.[4,5] The military sector's impact on global health is also rendered indirectly through collective security, which supports social order. This is

further exemplified through the employment of peacekeeping forces that facilitate and enable the transition from conflict to peace in war torn nations. Military assets also contribute to the global good on issues of national security such as bioterrorism, infectious diseases, and humanitarian assistance. However, the human and financial resource contributions of the military sector on global health are not clearly defined. Furthermore, the military sector itself could be perceived as a hindrance to health –in general—described as the "guns versus butter" tradeoff.

This article will illuminate the historical and current role of the military sector in global health and provide recommendations on what role it should assume in the future. It starts by describing the historical role of the military sector in the global health arena. The article continues with an in-depth analysis of the current military sector in the context of global health. The functional roles of the military sector are also detailed and then, key agreements are identified and described. The final section provides recommendations for the military sector's role in future global health activities.

HISTORICAL ROLE OF THE MILITARY SECTOR IN GLOBAL HEALTH

The historical role of the military sector in global health is diverse and substantial. The sector's impact through early direct investments in maintaining the health of military personnel to the indirect contributions of military leaders in the health and development arenas warrants discussion. Furthermore, international conflict involving the military sector has led to the establishment of organizations such as the World Health Organization (WHO) that currently lead global health efforts. Each of these contributions will be described in detail below.

Direct Investment

Early investments in health were made to maintain the fighting strength of military forces as they expanded the reach of their governments. These investments were the result of disease and non-battle injuries (DNBI) historically outnumbering casualties attributable to direct combat. The destruction of Napoleon's Grand Army following their withdrawal from Russia in 1812 due in large part to typhus and cold weather injuries serves as one of the most prolific examples of the impact DNBIs can have on military personnel.[6] Investments in health by states and the military sector

extended to the first International Sanitary Conference in 1851 where European nations focused on increasing international cooperation to decrease the risk of disease pandemics.[7] States realized diseases could no longer be addressed only through national efforts. International partnerships were critical to protecting their domestic populations. The primary objective of the conference was to develop maritime quarantine procedures to protect trade and shipping in the Mediterranean as well as maintaining the public health.[8] These procedures directly impacted European maritime forces and the states they engaged while performing their various security missions.

Individual Contributions

Many early examples exist of medical professionals who served in the military and contributed positively to broader global health. Sir John Pringle and Richard Brocklesby served as English Surgeons General during the War of Austrian Succession and Seven Years' War in the middle of the 18th century.[9] They were responsible for modifying medical doctrine and advancing military hygiene within the British forces. Their findings regarding the preservation of the health of troops were published and eventually influenced both civilian and military medical practices in other nations as well as the American colonies. Sir John Pringle is also credited with establishing the concept of the Red Cross in June 1743.[10] Pringle brought about an agreement between British and French commanders at the time of the battle of Dettingen in Bavaria identifying military hospitals as neutral, immune sanctuaries for the sick and wounded. This agreement would be codified in the Geneva Conventions in 1864 and replicated in the establishment of the International Committee of the Red Cross (ICRC).[11] The ICRC would be given authority under international humanitarian law to protect the life and dignity of the victims of international and internal armed conflict.[12]

Another military physician, James Lind, served in the Royal Navy as a surgeon and was responsible for promoting the use of citric fruits to prevent and combat scurvy among military personnel.[13] Other military medical personnel from the U.S. led efforts to combat tropical diseases during and after the Spanish-American War. Walter Reed and his research team identified the yellow fever vector allowing William Gorgas to clear Havana, Cuba of the disease.[14,15] Their combined research and disease prevention programs facilitated the completion of the Panama Canal by controlling the yellow fever and malaria vector.

In addition to military medical professionals, military sector leaders would go on to influence global health during post conflict eras. After serving as the U.S. Secretary of Defense during the Vietnam War, Robert McNamara was appointed as the 5th President of the World Bank Group in 1968. He served as the Bank's president for over 13 years where he transformed the Bank by focusing on poverty reduction. McNamara would develop programs to address the specific needs of developing nation populations to include nutrition, reductions in infant mortality, and health.[16] Under his leadership, the World Bank initiated lending operations specifically targeting the health sector.[17] Another military sector leader would assume a similar role at the World Bank in 2005. Following the U.S. led invasion of Afghanistan in 2001 and Iraq in 2003, outgoing Deputy Secretary of Defense Paul Wolfowitz would serve as the 10th President of the World Bank. During his tenure, Wolfowitz transformed the health strategy of the World Bank by making investments in health systems that addressed all health-related challenges.[18] These two examples highlight how previous military leaders influenced global health in the international development arena.

Conflict Influencing Global Health

During the 20th century, major international conflicts led to the establishment of multiple organizations that assumed roles in global health. Following the Paris Peace Conference that ended World War I, the Treaty of Versailles created the League of Nations to serve as the first international organization chartered to maintain world peace.[19] Within the Covenant of the League of Nations, Article 25 encouraged members to establish voluntary national Red Cross organizations chartered to improve health, prevent disease, and mitigate suffering throughout the world. Co-operation among the national Red Cross organizations was highlighted in the Article and continues to serve as the beacon for collaboration. Additionally, the League oversaw a Health Organization composed of a Health Bureau, General Advisory Council, and Health Committee. These organizations took up efforts to prevent and treat diseases such as leprosy, malaria, yellow fever and typhus among others. In 1921, the permanent committee of the International Congresses of Military Medicine and Pharmacy was established to increase military medicine cooperation worldwide.[20] Founded by eight nations (Table 1), the International Congresses of Military Medicine (ICMM) as it is known today is an intergovernmental organization consisting of more than 100 nations. The ICMM has

Memorandums of Understanding with the WHO and other United Nations (UN) Agencies. It maintains a world congress, scientific council, technical commissions, and working groups to further shape member nation roles in military and global health activities.

Following the League of Nations' inability to prevent WWII, the League would be terminated and replaced by the UN in 1946. During this period, the League of Nations Health Organization would be transferred to the UN and restructured before being renamed the WHO in 1948. The objective of the WHO as defined in their constitution is the attainment by all peoples of the highest possible level of health.[21] Sixty-four years later, the WHO remains a strong technical authority on global health related issues.

During the Cold War, disease transcended financial matters of Western Governments and became analogous to fighting communism.[22] Health was described as a safeguard against communist forces that were taking advantage of and exploiting the sick and impoverished throughout the world.[23] It was also during this time when resources began to shift from international development to military growth. The post Cold War era in conjunction with the technological expansion of the mid 1990s led to a contraction of the world and need to strengthen global military partners. Bi-lateral and multilateral relations sought to increase the health capacities and capabilities of partner militaries through direct and indirect investments.

CURRENT MILITARY SECTOR CONTRIBUTIONS

Global health is commonly accepted as an outcome of multiple sectors such as agriculture, education, environment, health, security, and trade. It is counterintuitive that the health sector may in fact not produce health, but instead serve as a gatekeeper of health while other sectors produce it. As governments explore the synergistic effect of multiple sectors on health, they frequently leverage military health resources to meet their global health, security, and political objectives. A review of senior foreign policy statements and literature used to better position global health within foreign policy found most nation states make decisions to employ global health on issues of national security and economic interests rather than on global humanity.[24] These findings explain why global health programs supported by the military sector targeting threats from bioterrorism and infectious diseases such as HIV/AIDS, avian and pandemic influenza achieve foreign policy priority over chronic diseases like obesity and

diabetes as well as injuries which contribute substantially to the global burden of disease.[25,26] The military sector is leveraging bi-lateral and multilateral relationships to expand national security related global health programs. The three major health related functional areas where the military sector is directly involved in global health activities include: 1) medical force protection, 2) humanitarian assistance/disaster response, and 3) medical stability operations.

Medical Force Protection

The first functional area, medical force protection, is defined by the North Atlantic Treaty Organization (NATO) as "the conservation of the fighting potential of a force so that it is healthy, fully combat capable, and can be applied at the decisive time and place".[27] Different militaries employ various programs to meet the intent of this definition. Preventive medicine programs designed to mitigate the debilitating effects of the environment, disease, and weapons systems play a prominent role. Active disease surveillance systems are also employed by the military sector pre-, during, and post-deployment to ensure military personnel are capable of performing their operational mission. The research and development of medical countermeasures to address areas of risk and build disease surveillance networks, not only benefit the military sector, but also the global health community. One clear example is the U.S. military's investment in overseas medical research laboratories.

The U.S. military maintains overseas medical research laboratories in Egypt, Georgia, Kenya, Peru, and Thailand to develop vaccines, therapies, medical devices, and new prophylactic drugs to support the needs of their military forces.[28] The medical contributions of these labs over the past 60 years extend well beyond military beneficiaries to all populations susceptible to neglected diseases. Specific examples of their contributions range from developing the first vaccine for Japanese encephalitis to the first successful HIV/AIDS vaccine trial.[29] Furthermore, the U.S. Armed Forces Health Surveillance Center's Division of Global Emerging Infections Surveillance and Response System (GEIS) partners with these laboratories to form a network to characterize the nature, emergence, and growth of vector-born infections globally.[30]

GEIS serves as the token institution within the military sector that directly supports implementation of the International Health Regulations. GEIS was established in 1997 in response to a U.S. Presidential directive addressing the threat of emerging infectious diseases both domestically and

internationally.[31] Since inception, capacity building efforts led by GEIS aided both military and civilian organizations in 46 countries worldwide and were conducted in conjunction with other U.S. government organizations to include the Department of Health and Human Services (e.g. the Centers for Disease Control), the Department of State, and the U.S. Agency for International Development.[32] Capacity building efforts include developing laboratory infrastructure, increasing host-nation disease surveillance capability, and transferring technical knowledge to partner nations, which supported their efforts in meeting the implementation milestones of the 2005 IHRs.[33] GEIS also supports global health and the global good by building a network of international partners and laboratories capable of identifying, analyzing and responding to emerging disease vulnerabilities.[34]

One of the greatest contributions to the success of the U.S. military laboratories and surveillance program is the collaborative relationships they share with scientists and public health personnel in the host nations they support.[35] This collaborative relationship extends beyond the public sector where the laboratories partner with international organizations, nongovernmental organizations, research institutes, academia, foundations, and the business sector to build true scientific capacity throughout their respective regions of the world.[36] The combined efforts of the U.S. military overseas laboratories and surveillance program may have one of the largest direct contributions to global health out of any other program in the global military sector.

Another example of a military medical force protection program that contributes significantly to global health is their fight against HIV/AIDS. Military sector personnel play a unique role both at home and in deployed environments where they may be supporting populations in crisis. The crises may include disasters, conflict, post-conflict, or complex emergencies where populations may be displaced and potentially bring about an increase in HIV vulnerability. Military personnel are in a position to serve as partners in HIV/AIDS prevention, testing, care, and treatment of these populations until other sectors can assume the responsibility.[37] In addition to supporting other populations at risk, military personnel are themselves a target audience for HIV/AIDS programs. Peacekeeping forces are routinely deployed to crises where they may engage the vulnerable population in sexual activity that places them at high risk for acquiring HIV. Additionally, concerns of high HIV prevalence among military personnel in African militaries and possibly introducing HIV to countries they are serving during peacekeeping operations exist.[38,39,40] However, a recent scientific study

found peacekeeping does not pose a major risk of HIV transmission to host countries and that most peacekeepers do not originate from countries with higher HIV prevalence rates than the host country they are supporting.[41] Furthermore, troop-contributing countries make significant efforts to prevent HIV among their personnel.

This is due in part to the UN Security Council Resolution 1308 that recognized the threat of HIV/AIDS to international peace and security which gave rise to incorporating HIV prevention, treatment, care and support during international peacekeeping missions.[42] The Global Uniformed Services Task Force on HIV was established to address these concerns and includes multiple partners from international organizations, regional networks, and research institutes (Table 2).[43] Their mission is two-fold and includes "Strengthening and expanding effective HIV prevention, AIDS care, treatment and support for uniformed services personnel, their families and communities, in both developed and developing countries; and to assist national AIDS programmes in harnessing the full potential of uniformed services as behavioural and social change agents".[44] A core member of the Task Force is the U.S. military, which possesses their own Department of Defense HIV/AIDS Prevention Program (DHAPP). With an annual operating budget of approximately $8 million USD, DHAPP provides the world's largest HIV assistance program to militaries impacting 4.8 million military members and as many family members in 82 countries.[45,46] DHAPP efforts assist in establishing and maintaining HIV prevention, care and treatment programs for not only military members, but also their dependents and surrounding communities. A unique example where non-governmental and intergovernmental sectors support the military in HIV/AIDS can be found in Timor-Leste. The non-governmental organization Family Health International received funding support from the U.S. Agency for International Development to manage the Timorese Defense Force HIV/AIDS prevention program.[47] These examples clearly highlight the investments made by and with the military sector to address a common global health challenge.

Humanitarian Assistance and Disaster Response

The second functional area, humanitarian assistance/disaster response, has and continues to play a prominent role for the military sector. The provision of aid by the military can be traced back to the time of Alexander the Great and extends through the Napoleonic Wars, World Wars of the Twentieth Century, and other areas of conflict, disaster and

complex emergencies to include the Congo, Bangladesh, Ethiopia, Sudan, Iraq, the former Yugoslavia, Rwanda, Mozambique, and Afghanistan.[48] Humanitarian assistance is routinely provided by the military sector in times of disasters as a foreign policy tool when the civilian sector capacity is exceeded.[49,50] Elements such as transportation, communications, logistics, and health are provided by the military to support the international response and meet the basic humanitarian needs of the affected population.

In 2010, there were over 250 natural disasters globally including the shocking Haiti earthquake and devastating Pakistan flooding.[51] In Haiti, the U.S. military spent $464 million USD to deliver 17 million pounds of food and 2.6 million liters of water, treat 9,758 patients, deliver 149,045 pounds of medical supplies, and relocate over 3,800 displaced personnel among other missions.[52] In Pakistan, the U.S. military evacuated more than 30,000 Pakistanis from flood-ravaged areas and delivered 22 million pounds of relief supplies.[53] Other examples of militaries engaged in international disaster relief include India's military support to Sri Lanka, Indonesia, Pakistan, the Philippines, and even the U.S. following Hurricane Katrina.[54] Russia delivered 350 tons of humanitarian aid using 15 military transport planes to China following the 2008 Sichuan earthquake.[55] Five military field hospitals representing different countries were deployed to both the 2003 Bam earthquake in Iran and the 2005 Asian Tsunami.[56] NATO as well as the U.S. military deployed field hospitals to Pakistan following the 2005 earthquake with the latter transferring the facility to the host nation military upon redeployment.[57,58] The military sector also supports domestic disaster response efforts in a whole of government approach as exhibited by the Pakistan Army during the 2005 earthquake and 2010 floods.[59,60]

For each major international disaster, the probability of the military sector supporting the response effort during the initial stage is high. Military organizations work with the U.N. Office for the Coordination of Humanitarian Affairs (UNOCHA) and the WHO Global Health Cluster during the crisis to increase the efficiency and effectiveness of the military sector response. In doing so, the military ensures their efforts are integrated with the overall civil-military response and meet the core principles of humanity, neutrality, and impartiality in accordance with the U.N. Oslo Guidelines.[61] To further promote the principles and broader humanitarian policies, UNOCHA established a liaison office in Brussels in 2007. This office continues to strengthen relationships with multiple organizations in Europe to include NATO. UNOCHA also works closely with the U.N. Department of Peacekeeping Operations to train

peacekeeping forces that may be deployed to support humanitarian assistance missions as part of broader international disaster response efforts.

The military sectors involvement in disaster response activities when requested by the international community typically does not generate consternation with other humanitarian actors. However, a rift does exist when the military sector engages in humanitarian activities in permissive environments where traditional humanitarian and development actors provide support.[62] The U.S. military maintains a congressional appropriation for humanitarian and civic assistance missions. Budget estimates for fiscal year 2011 submitted by the military to U.S. Congress included $83.4 million in support of 499 projects conducted by their six regionally focused Combatant Commands.[63] Projects may range from training partner nation military personnel in medical skills to renovating health care clinics in austere environments. A comprehensive review of all HA projects completed by the U.S. military from 2006 to 2008 found 19 percent focused on health care infrastructure while another 6 percent supported health care training and provision.[64] Not included in these figures are the costs associated with military hospital ship humanitarian assistance missions.

Based on the perceived success of the U.S. military hospital ship mission in support of the Asian Tsunami response, the U.S. military continues to deploy their two hospital ships, the USNS Mercy and USNS Comfort, on humanitarian assistance missions to the Pacific, Latin America, and Caribbean regions.[65] The missions known as Pacific Partnership and Continuing Promise last approximately 4 months and typically include port calls to 4 or more partner states. Humanitarian assistance is provided in the form of direct patient care both on the hospital ship and ashore through medical outreach missions. The perceived positive impact of the hospital ship humanitarian assistance missions is increasing their use by the U.S. government and other nations. The Chinese military recently built and deployed their hospital ship, the Peace Ark, to Africa and the Caribbean to provided similar types of services.[66,67,68]

Medical Stability Operations

The third functional area, medical stability operations, was defined by the U.S. military in a 2010 Department of Defense Instruction as "tasks assigned to establish, reconstitute, and maintain health sector capacity and capability for the indigenous population when indigenous, foreign, or U.S.

civilian professionals cannot do so."[69] In this seminal document, medical stability operations were put on par with health service support to combat operations. These medical tasks support the military sectors involvement in peace, conflict, and post-conflict missions and have been exercised by different nations during the Philippine Insurrection, Malayan Emergency, and Vietnam War under various terminology (e.g., unconventional warfare and counter-insurgency operations). The military sector in Iraq and Afghanistan leverage Medical and Civic Action Projects (MEDCAPs) and Provincial Reconstruction Teams (PRTs) represented by different contributing nations to conduct medical stability operation tasks. MEDCAP and PRT missions are typically conducted in remote environments as part of the military sectors counter-insurgency strategy. Strengths and weaknesses to these approaches are well documented in the literature.[70,71,72,73,74,75,76] According to NATO who plays a leading role in Afghanistan security, the military sector is likely to remain engaged at the forefront of humanitarian distress and has a moral obligation to provide support when aid is not provided by others.[77] Beyond the three major functional areas, the military sector contributes to global health through investments in the global good, peacekeeping operations, and health related human and financial resources. Each of these is described below.

Global Good

Humanitarian assistance, disaster response and medical stability operations are driven by key international agreements and are designed to meet national security interests, improve global health, and have a positive impact on the global good. Unfortunately, not all pundits believe national security serves as a global good. Some argue national security can be described as a public good where the costs to sustain a robust security element are supported via the financial mechanisms of individual states.[78] However, others contend military spending has a negative impact on technological development in the civilian sector.[79,80] The theory of technological displacement is based on pulling highly skilled individuals (e.g., scientists) from the civilian sector to meet an increasing research and development demand in the military sector. This displacement may stymie innovation in civil society and negatively impact private sector economic growth.

Furthermore, the traditional macroeconomic model of guns versus butter describes the decision nations make between investments of finite resources in national security (guns) or the production of other goods

(butter).[81] Using this model, there is an underlying assumption that an investment in one will take resources away from the other. A recent quantitative study looking at the correlation between military spending and infant mortality rate and life expectancy at birth found a negative relationship.[82] Hyatt (2007) used a cross-sectional time-series model (88+ countries over 8+ years) and found as many as 2.5 additional infant deaths per 1,000 live births and a reduction of six months in life expectancy at birth result for each 1 percent of gross national product diverted from domestic welfare programs to military projects. He recognizes the need for security in order to afford basic levels of well-being, but suggests nations find ways to balance the guns versus butter tradeoff. It is important to highlight the guns versus butter model does not account for positive externalities where an investment in military spending such as peacekeeping operations may yield an improvement in both security and other public service sectors such as health.

Peacekeeping Operations

As of October 31, 2011, the United Nations Department of Peacekeeping Operations was supporting 16 operations globally with 121,787 military, police and civilian personnel.[83] The primary mission of peacekeeping operations is to deliver security and early peace-building support to facilitate the rapid transition from conflict to peace in war torn nations. The budget allocated to accomplish this mission in 2011 was $7.06 billion USD.[84] However, these personnel and financial investments do not account for other organizations involved in "peacekeeping" operations. Organization such as NATO, African Union (AU), European Union (EU), Organization for Security and Co-operation in Europe (OSCE), and Multinational Force and Observers (MFO) have approximately 83,687 personnel deployed globally in peace supporting missions.[85] Although peacekeeping missions historically kept warring nations apart while peace negotiations could take place, peace-building efforts are becoming more prevalent.[86]

Peace-building is defined as the actions which foster and support sustainable structures, institutions and processes that strengthen the prospects for peaceful co-existence and decrease the likelihood of the emergence, reoccurrence, or continuation of deadly conflict.[87] Peace-building emerges when peacekeeping forces are used to maintain order within countries and facilitate their transition from failed-state status to stable and prospering nations. The focus of these operations is to address

the underlying root causes of conflict that predispose nations to internal strife. These root causes often include a lack of access to basic essential services such as healthcare provided by the local government.

As the role of peacekeeping and peace-building missions transform, their impact on global health through the absence of conflict needs to be scientifically explored. It is reasonable to assume secure environments contribute to economic development at the individual and community levels, which facilitate national progress in other sectors such as health. Individuals living in secure environments should have greater access to basic services such as food, water, and sanitation that improve health status. As health status improves, individuals are able to attend school and develop the skills necessary for employment. As individual and family income rises, overall health status improves as more time and effort is spent in maintaining health. Through improved security, health, and income, economies begin to grow. However, there are circumstances where the converse may be true. Although the security environment in Afghanistan has declined in recent years, the overall health status of the population has improved. Afghanistan may present a unique case study in evaluating the role of conflict on population level health. Nevertheless, further studies need to explore the causal relationship between conflict and health and determine what level of investment in peacekeeping and peace-building operations is commensurate with improved global health outcomes.

Human and Financial Resource Contributions

In terms of financial impact in the global health space, the military sector plays a limited role. The World Bank estimates the global economy at $70 trillion USD, the health service space at $4 trillion USD and official development space at $30 billion. Global investment in the military sector reached $1.6 trillion USD in 2010 (Table 3).[88] Unfortunately, current investment in global health activities contributed by the military sector is not publically available. Furthermore, what is known highlights the convoluted funding mechanisms associated with disparate programs that either directly or indirectly impact global health activities

Using the U.S. Department of Defense as an example, the military requested $52.5 billion USD for fiscal year 2012 to fund the military health system.[89] The total appropriation would support 9.6 million beneficiaries that include active duty service members and their families, retirees and their families, dependent survivors, and other eligible military reserve

members and their families. Not included is this request are global health activities conducted in support of medical stability operations or during humanitarian and disaster response missions. For example, medical outreach activities conducted as part of PRT operations in Afghanistan are funded by the Overseas Contingency Operations Fund while responses to the Asian Tsunami in 2004 ($95 million USD) and the Haiti earthquake ($464 million USD) in 2011 come from the Overseas Humanitarian Disaster Assistance and Civic Aid account.[90,91] Research and development supporting U.S. DoD military labs and the DoD HIV/AIDS Prevention Program (DHAPP), which receives approximately $8 million USD for international engagement annually, also have separate funding authorities. Additionally, the different military medical services (Air Force, Army and Navy) have separate funding appropriations for conducting global health related activities that result in a loss of common purposefulness. It is not within the scope of this paper to define each authority related to U.S. military global health activities; rather use this one nation to highlight the complexity in defining the total global health resource investment by the military sector.

What can be learned from this example is the military healthcare system invests heavily in human capital to support the health care needs of their beneficiary population. Other countries such as Pakistan run Combined Military Hospitals that provide health services to both military beneficiaries and the civilian population on a fee-for-service basis.[92] The Senegalese Army also plays an active role in the public health system through direct involvement at every level of their governmental health care structure.[93] This investment generates not only an increase in the overall health status of the beneficiaries, but also the individuals employed to support the system. Military sector health care civilian and military employees earn salaries, which thereby increases their ability to purchase health services and increase their own heath status. Furthermore, when military sector healthcare employee's transition to the civilian health sector, they bring their training and experiences back to the general population. Building upon the modernization theory that posits overall military spending results in improved economic performance attributable to the positive stimulus on the private sector economy, we can assume this impact includes the health sector.[94]

FUNCTIONAL ROLE OF THE MILITARY SECTOR IN GLOBAL HEALTH

The role of the military sector in global health is diverse. It includes normative, technical, and operational functions. The most influential normative setting organization for international actors in the global health arena is the WHO. Their group of experts from public, private, academic and other diverse organizations brings to bear credibility that can build common purpose. Setting criteria for global health activities using evidence-based research is their hallmark. Actors within the military sector exude similar normative influence through medical force protection research and development efforts. The U.S. military DHAPP serves as an example by funding AIDS treatment as part of a comprehensive program. These activities reinforce the value of life by providing treatment to both military and civilian personnel. Antiretroviral treatment serves as a private and public good as it meets the needs of the individual while impacting HIV prevention, a public good.

The military sector also supports and provides technical assistance to the global health community through research and development programs focusing on neglected diseases, HIV/AIDS, and surveillance activities. Technical assistance extends into the disaster preparedness and response domain where the military maintains a comparative advantage in mitigating and rapidly responding to international crises.[95] Furthermore, the military engages in disaster response and humanitarian assistance missions in an operational capacity by implementing programs to support governments and their people.

Similar to the WHO's first assessment of the combined effects of the major global health initiatives, the effect of the military sectors involvement in global health is also mixed.[96] The positive health impacts on military and civilian populations such as increased access to anti-retrovirals, greater disease surveillance capability, and medical professional training, are often overshadowed by the lack of internal and external evaluation of medical stability operations efforts. With limited monitoring and evaluation capacity to quantify impact, collective effects of military investments in global health are woefully unknown. As the WHO forces evaluation back onto the global agenda, shortfalls in performance monitoring among global health initiatives and actors to include the military sector will become more evident.[97]

KEY INTERNATIONAL AGREEMENTS IMPACTING THE MILITARY SECTOR

Geneva Conventions

The Geneva Conventions have shaped the role of the military in the global health sector more so than any other international agreement. Established in 1864, the first convention set out to ameliorate the condition of wounded and sick military forces deployed in the field. Two additional conventions would be added in 1906 and 1929 to address the conditions of military personnel at sea and those captured as prisoners of war. The fourth Geneva Convention was added in 1949 following the atrocities committed during the Second World War. This convention established international law regarding the humane treatment of individuals not engaged (e.g., civilians), and those no longer engaged (e.g., prisoners of war), in hostilities. The fourth Convention specifically states during the time of armed conflict, the occupying power takes over all responsibilities of the previous government.[98]

Specific tasks outlined in Article 55 of the fourth Convention say the occupying power has the duty of ensuring the food and medical supplies of the population to the fullest extent of the means available to it. Article 56 further specifies the occupying power has the responsibility to maintain hospitals as well as public health and hygiene with the cooperation of national and local authorities. What is less clearly defined is when and how does the "occupying force" transition the responsibility for providing services? Furthermore, how the Conventions apply to unconventional warfare is not clearly defined in these terms. The first three articles established under the general provisions section of the fourth Geneva Convention specify when the conventions apply to signatory governments. Article 3 addresses the case of "armed conflict not of an international character" and specifies the binding agreement of services by signatory parties. The term armed conflict is not clearly defined and may be interpreted as unconventional warfare by others which places the responsibilities outlined in the fourth convention on any nation involved in these types of conflicts.

International Health Regulations

The Constitution of the WHO gives the World Health Assembly the authority to adopt regulations that would prevent the international spread

of disease.[99] In 1969, the Assembly adopted the first International Health Regulations in pursuit of this objective.[100] The IHRs were updated in 2005 and became a binding international legal instrument for 194 States Parties to the IHRs.[101] Rules designed to assist the international community in preventing and responding to acute public health risks were established. The 194 States are required to implement the core rules by 2012 and the military sector is assisting in meeting this timeline. By opening and supporting lines of communication between and among IHR States Parties, the military sector further enables true global health collaborative exchanges and health system strengthening.[102]

United Nations General Assembly Special Session on HIV/AIDS (UNGASS)

In 2001, the United Nations General Assembly convened a special session on HIV/AIDS to address the public health crisis. A Declaration of Commitment was adopted during the session by the international community, which set out common targets and goals to reduce the spread and mitigate the impact of HIV/AIDS.[103] The Declaration would lead to greater resource investments by the international community and eventually support the military sector's involvement and leadership in this global fight.[104,105]

Oslo Guidelines

The United Nations Department of Humanitarian Affairs (DHA) collaborated with multiple humanitarian actors in the early 1990s to clarify the role of military and civil defense assets (MCDA) in disaster relief activities. They co-sponsored a workshop in 1992 with the International Federation of Red Cross and Red Crescent Societies that was hosted by NATO in Brussels. The meeting of civilian and military organizations sought to establish guidelines for the use of MCDA in humanitarian missions among other objectives. In 1994, the Government of Norway built upon these initial efforts by hosting a high-level conference with similar actors to further develop the guidelines that had taken shape since the Brussels workshop. A draft document received support at the conclusion of the Oslo International Conference, was published in May 1994 and become known as the Oslo Guidelines.[106] The Oslo Guidelines outlined the use of military and civil defense assets in disaster relief and were updated in 2006

and revised again in 2007 due to an "unprecedented deployment" of military forces in 2005 in support of natural disaster responses.

Military and Civil Defense Assets Guidelines

Immediately following the Oslo meeting in 1994, DHA set out on a military and civil defense assets (MCDA) project aiming to increase the volume and efficiency of the international community's contribution to humanitarian operations and further develop and disseminate procedures to avoid relief delays throughout the world. The MCDA project continued to inform the Oslo Guidelines and indirectly gave rise to the MCDA Guidelines.[107] The guidelines specify the use of international MCDA in support of the UN where they are pursing humanitarian objectives in complex emergencies. Both the Oslo and MCDA guidelines directly shape how military assets should support disaster response and humanitarian missions that have a significant health care component.

WHO Civil-Military Coordination Paper

In February 2011, the World Health Organization Global Health Cluster (GHC) published a position paper entitled "Civil-Military Coordination During Humanitarian Health Action."[108] Although provisional in nature, the paper was designed to guide country-level health clusters on how to apply civil-military coordination principles to humanitarian health operations. Several key messages not captured in the aforementioned guidelines include humanitarian actions should not be used to advance security and/or political agendas, deployed military forces should provide health assistance to civilians only as a last resort, and acknowledgement of the new roles played by the military in the global health sector. The paper recognizes a common goal and cooperation may become possible between civilian and military health actors in relatively peaceful environments. However, during armed conflict simple co-existence is suggested as the appropriate civil-military modality to ensure military actors do not jeopardize the impartiality of humanitarian actions. The GHC clearly states the guiding principle for health activities should be based on assessed health needs and humanitarian principles, not political or military objectives. The position paper concludes coordination with military forces may continue to skew local actors' and populations' perception of the impartiality exhibited by humanitarian health actors.[109] Although, the GHC is represented by 38 UN partners, non-UN partners, and observers,

military sector representation (e.g., UN Peacekeeping, NATO, AU) appears to be lacking.[110]

RECOMMENDATIONS FOR IMPROVING THE MILITARY SECTORS ROLE IN GLOBAL HEALTH

Political

Politicians often leverage health services provided by the military sector to meet first track diplomacy efforts. Using military health capabilities to meet political objectives may in fact undermine and or place a heavier burden upon third track diplomacy health efforts managed by the development community. As the global economic crisis pushes states like the U.S. to decrease their investment in the military sector, this may force military health resources back toward their primary mission of supporting its beneficiary population. International humanitarian assistance activities conducted by militaries in permissive environments such as hospital ship missions may decrease in number and frequency to make up for the projected budget cuts. This should force individual states to increase their investment in civilian capacity to meet the growing humanitarian and disaster response requirements instead of perpetuating the ad hoc use of military forces as a gap solution.[111] Eliminating the military sectors role in humanitarian assistance is not being suggested; instead focusing efforts where they are required as identified in international agreements such as the Geneva Conventions may be a more appropriate investment.

As such, the military sector should review Articles 55 and 56 of the Geneva Conventions in conjunction with other sectors and clarify the role they should play in sustaining and rebuilding the health care of a nation as the "occupying power" during times of conflict based on recent experiences in Iraq and Afghanistan. Are other sectors (e.g., private and/or NGO) better suited than the military and willing to support the immediate health care needs of the host nation population during times of conflict through the support of the "occupying power" development agencies like USAID? Should there be a specified and funded role for the military sector in rebuilding the civilian health sector capability, which is typically a development function? Answers to these questions should be based on empirical analysis of health inputs by the "occupying power" and their impact on health outcomes following operations in Afghanistan and Iraq. These findings, in conjunction with previous conflict analysis, would provide evidence to support an objective review of Articles 55 and 56 to

ensure the intent of the Geneva Conventions is being met in the most efficient and effective manner by the most appropriate sector.

Furthermore, the findings of such an analysis could inform the current debate surrounding the causal effect of health on security or vice versa and what role the military sector should perform in one or both. The 2011 World Development Report found countries experiencing major violence from 1981-2005 on average had a poverty rate 21-percentage points higher than similar countries not experiencing violence.[105] Based on these and other findings in the report which suggest security must exist before development can successfully take root, is the military sector's role in providing, upholding, and enabling security sufficient by itself to enable the development community to meet the global health needs? Additionally, in what sequence should security, development and rule of law be leveraged in the various environments (e.g., conflict, post-conflict, stability operations) to achieve the greatest global health impact? Gaining a better understanding of when, where, and why the military sector engages in different areas such as security, health sector development, and rule of law in an effort to achieve overlapping objectives is necessary to determine if the continued investment in all three areas is appropriate and smart.

Strategic

The military sector should continue to support global health through its comparative advantage in medical force protection research and development. The investments made by the sector in these activities are appropriate and ethical and yield direct and indirect health benefits for the global community. Expanding existing multilateral organizations such as the ICMM and Global Uniformed Services Task Force and pooling resources may improve near term efficiencies of existing independent military investments in research and development. Improvements in near term efficiencies will in the long term improve the overall effectiveness of the sector writ large. For this to occur, ICMM and Task Force membership must increase and individual military representatives authorized to speak and act on behalf of their military. Bold, but necessary steps to ensure the organizations are relevant and decisive in taking appropriate action to move pragmatic efforts forward. A functional and transparent military global health financing mechanism to support expansion of these organizations is also necessary.

Financial

One option to consider is the ICMM model of assessed dues based on a percent of GDP or non-assessed in terms of voluntary contributions. The latter recommendation assumes access and influence in the organization will not be hindered based on overall contributions. Additionally, transparency in what elements of the organizations are being funded must prevail. Ensuring all members cover some element of administrative costs is essential for the overall organizational success. Mutually agreed upon priorities for medical force protection research programs by participating nations could result in greater financial investment through increased political support both in and out of the military sector. With an increased number of militaries and their beneficiaries having access to more public health related products as a result of these expanded partnerships, the global good contribution could be substantial.

The military sectors direct and indirect investment in global health has and continues to remain robust. Through further enhancement of existing structures, this role can become more efficient and effective in supporting the global good. The health and security of individuals and states throughout the world deserve nothing less.

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Table 1. Founding Members of the International Congress of Military Medicine and Pharmacy

Nations as of 1921
Belgium
Brazil
France
Great Britain
Italy
Spain
Switzerland
United States of America

Table 2. Global Uniformed Services Task Force Members

Core Membership	Additional Stakeholders
1. The Joint United Nations Programme on HIV/AIDS 2. The United Nations Population Fund 3. The United Nations Department for Peacekeeping 4. The United Nations Development Program 5. The United Nations Office on Drugs and Crime 6. The United States Department of Defense 7. The Netherlands Ministry of Foreign Affairs	1. The African Union Department for Peace and Security 2. The Latin American and Caribbean Armed and Police Forces Committee for AIDS Prevention and Control 3. Southern African Development Community 4. Western and Central Africa Regional HIV Network of Military Forces 5. East African Community 6. Pacific Island Chiefs of Police 7. The Thai Military Research Institute and Regional Training Centre 8. The World Health Organization 9. International Centre for Migration and Health 10. AIDS, Security and Conflict Initiative 11. The Institute for Security Studies, South Africa 12. International Committee of Military Medicine

Table 3. Top 10 Military Spending States

State	Military Spending in billions USD[1]	Military Expenditure as Percent of GDP[1]	Health Expenditure as Percent of GDP[2]
US	698	4.8	16.2
China	119*	2.1*	4.6
UK	59.6	2.7	9.3
France	59.3	2.3	11.7
Russia	58.7*	4.0*	5.4
Japan	54.5	1.0	8.3
Saudi Arabia	45.2	10.4	5.0
Germany	45.2*	1.3*	11.3
India	41.3	2.7	4.2
Italy	37.0*	1.8*	9.5

[1]Stockholm International Peace Research Institute (2010 data), asterisk represents estimated calculation
[2]The World Bank (2009 data)