African Security Challenges: 
Now and Over the Horizon

Current and Future Security Dimensions of Disease in Africa

WORKING GROUP DISCUSSION REPORT

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SECTION 1: BACKGROUND

On February 6, 2007, U.S. President George W. Bush directed the establishment of a new Combatant Command focused on Africa. The announcement of U.S. Africa Command (AFRICOM) kindled a flurry of discussion amongst Africa watchers in Washington, DC and beyond. Debate largely centered on the implications of this announcement, the mission of the new Command, its location, and above all, how AFRICOM actions would reconcile with those of other players in the region and whether the decision signified a militarization of U.S. policy in the region.

Irrespective of this debate, the establishment of the Command reflects several important changes in U.S. Government, particularly U.S. Department of Defense (DoD) perceptions about the importance of Africa to U.S. strategic interests. Previously, three geographic Combatant Commands (COCOMs) shared responsibility for Africa, a situation that sometimes resulted in fragmented action in the region. AFRICOM’s almost continent-wide responsibility allows the DoD to assume a comprehensive approach as it addresses security challenges on the continent, suggests an increasing recognition of the commonalities across African states and regions, and serves as an acknowledgement that many security concerns and obstacles, as well as their root causes and effects, transcend these physical boundaries. The Command’s interagency component also suggests a greater recognition of the need for consistent coordination of U.S. activities to address these security challenges. The DoD is but one player in the region and must consistently work with other U.S. Government departments and agencies to support broader activities in the region when appropriate.

With this heightened interest and attention in mind, the Defense Threat Reduction Agency’s Advanced Systems and Concepts Office (DTRA/ASCO) initiated a fundamental research assessment of African security challenges – what they are today and what they might be over the horizon. This assessment could be used to inform future planning and research for ASCO, and inform those U.S. Government players active in the region, including, but not limited to the newest form of DoD engagement, AFRICOM.

Research Objective and Approach

It is important to note that the vision for this project at the outset was to study AFRICOM’s mission and structure and determine how these would affect the way that the Command addressed security challenges in the region. When it was determined that many conferences, workshops, and publications had already addressed this topic (coupled with the fact that the AFRICOM mission and structure were still being refined as it stood up), the research team realized that a broader and more fundamental “challenges-centric” assessment was needed. Indeed, many players were rightly investigating the “nuts and bolts” of AFRICOM and other U.S. engagement in the region (specifically how that might be affected by the stand-up of the new Command), yet few were conducting a comprehensive assessment of what security challenges those players might need to address today and in the future. The research team felt an “over the horizon” aspect was especially important and an area in which our research could inform future strategic planning.
The research objective was to define the major categories of security challenges in Africa today and explore possibilities for what they might be over the horizon. Using fundamental insights from academic and research experts to develop a better understanding of those challenges, the research was intended to explore how the challenges intersect and identify their importance for U.S., especially AFRICOM, activities and engagement on the continent. This research would provide a platform for further study of how the United States can address the identified challenges through various (and ideally coordinated) forms of engagement, including AFRICOM.

To accomplish this objective, the research team performed academic literature and expert reviews to identify a large list of African security challenges with the recognition that there is some debate among experts on the challenge areas and their importance relative to one another. The team also surveyed U.S. Government strategic documents (including AFRICOM mission and vision statements) to obtain a list of those challenges the government identifies as important. Eventually, this list was pared down to three broad categories of challenges and served as a foundation for an academic workshop at which the security challenges were discussed in October 2008.¹

1. Transnational security issues
   a. Small arms/light weapons
   b. Maritime security
   c. Disease

2. Internal and regional conflict
   a. Border issues, spread of conflict, and peacekeeping
   b. Humanitarian assistance, refugees, and internally-displaced persons
   c. Rebels
   d. Post-conflict reconstruction issues

3. Potential flashpoints/future security challenges
   a. Weapons of mass destruction (WMD) and R&D developments
   b. Oil and natural resource competition and exploitation
   c. Terrorism and radical Islam
   d. China and other states

While the approach to the challenges selection was not scientific, the research team viewed this research project as a starting point and not an end point in the study. The workshop in October 2008 provided a foundation for more in-depth and specific discussions and research on major security challenges and their implications; it also pointed the research team to several issues involving government and academic debate. Additionally, it highlighted the need to consider various methodologies to discuss security challenges among

¹ The list was pared down for both practical and budgetary reasons. That is, the research team needed to conduct a one day workshop with academic experts and therefore tried to select challenges that could be discussed within that timeframe, but also allow for broad participation among many types of experts. It also selected challenges of particular interest to the sponsoring organization (DTRA/ASCO) and incorporated some challenges that might not be viewed as important today, but could dramatically affect the security landscape tomorrow.
these two groups to ensure effective discussion. Indeed, it was also widely understood that one study would not be enough to accurately and comprehensively capture the challenges that make up the African security environment.

After the October 2008 workshop, the research team selected four specific challenges, or in some cases combined ones, from the above challenge list to receive more in depth attention by way of working group discussions and analytic papers over the course of the next several months. Participants at these working group discussions would focus on the current and possible future nature of a specific challenge, for example, small arms and light weapons, and how it might intersect with others. They would also preliminarily consider the implications of this challenge for U.S. engagement on the continent. In particular, participants would focus on the dimensions of the challenge that might be manipulated and issues associated with that manipulation.

The topics selected for further study included: weapons of mass destruction, small arms and light weapons, disease, and militancy and refugees. After the four topical discussions, the research team would host an additional working session to synthesize results to date, get additional inputs, and consider the “so what?” question for U.S. engagement on the continent in greater depth. It would also consider the next steps in the research endeavor. While the topical discussions would mainly involve academic participants, this last working session would more directly involve government players.

The report that follows outlines the results of the third working group discussion session that focused on disease. As such, this report should be viewed as one element of the research endeavor on African security challenges with complete results and findings still pending.

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2 These topics were selected for several reasons. They were the subject of broad debate at the October 2008 workshop or similar events, of interest to the sponsoring organization, and/or lacked extensive study within the U.S. Department of Defense.
SECTION 2:
WORKING GROUP DISCUSSION SESSION OBJECTIVES, SUCCESSES, AND DIFFICULTIES

Objectives

DTRA/ASCO invited a small group of experts on the security dimensions of disease in Africa to participate in a working group discussion to better define the nature of the threat, the possible implications for U.S. engagement, and the ways in which the threat (if deemed important) could be manipulated through activities on the continent. It is important to note that the starting point assumption was that there were security dimensions to the disease problem in Africa, though the workshop organizers acknowledged that security was not the only dimension of the problem which must be considered when analyzing the issue and responding to it (that is, a health lens must also be applied to the problem).

As the third in a series of working sessions on specific security challenges, this working session, like the others, had a secondary objective. Experiences at the October 2008 workshop suggested that there are some difficulties associated with conducting government and academic dialogue on security challenges. This was especially apparent when analyzing the different priorities and approaches of the two communities when assessing security challenges. One question that revealed the different priorities of the communities, for example, is the issue of whether to consider the root causes of the security challenge area or only their effects. Further, what are the implications of that decision for formulating and implementing policy and related activities in the challenge area? This working session served as one test case to refine ways to facilitate government and academic dialogue in such a way that can most effectively inform strategic planning and understanding while reflecting the analytic complexities of the study topics.3

Working Group Discussion Structure

Participants

The core meeting participants were largely drawn from the academic sector. Four represented a non-military U.S university/college (with one of these academic-based participants also representing a non-profit research organization). One represented a U.S. military education institution. Another represented a U.S. Government organization and a non-profit research organization. Each of the six expert participants had a publishing record on the intersection of disease and security in Africa and/or extensive recent experience addressing such issues on the ground in Africa. The majority of the participants were experienced in engaging with American or other Western governments; this allowed for a very detailed discussion of the implications of the disease situation in Africa for U.S. engagement on the continent. Additional observers/moderators represented AFRICOM.

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and DTRA. In all cases, the participants shared the assumption that disease can/should be analyzed (though not solely) through a security lens.

**Agenda**

The working group session was comprised of both presentations and plenary discussions. In advance of the meeting, the research team determined that in order to best address the disease topic it was necessary to further break down the topic area into three “disease categories”. Based on research and discussions with knowledgeable individuals in the field, the team selected the following categories: 1. Acute Infectious Diseases (AID); 2. Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS) and Tuberculosis (TB); and 3. Parasitic Diseases. The research team selected two participants, Frederick Burkle from Harvard University and the Woodrow Wilson International Center for Scholars and Andrew Price-Smith from Colorado College, to develop draft foundational papers which would each consider the current and possible future security dimensions of a particular disease category in Africa and serve as catalysts for broader discussion. Burkle focused on acute infectious disease while Price-Smith focused on HIV/AIDS and TB. Patrick Lammie of the U.S Centers for Disease Control and Prevention and the Sabin Vaccine Institute also provided a presentation on parasitic diseases. The three experts were asked to consider two major sets of questions in their paper or presentation and focus their answers on their assigned disease category:

- What are the dimensions of the disease challenge in Africa which might be considered within a security framework in particular? How do they intersect?
- What social, political, cultural, and economic root causes must be considered when addressing the linkages between diseases and African insecurity? What effects must be considered? How can an understanding of these causes and effects inform our understanding of the mutual impact diseases have on African security? Are there tradeoffs in focusing on causes and effects? Is there a way both can be considered in an analysis to inform decision-making and if so, how?

All participants received the draft papers in advance of the working group session. After each author presented his paper, the other participants provided specific comments on the paper to assist the author in his revision. In addition, the participants discussed broader concepts in the papers.

After the paper presentations, the participants contributed to a moderated discussion of how the security dimensions of the disease problem in Africa differed or were the same across the three disease categories and the analytic implications of these differences or similarities. During this discussion, other analytic challenges were also raised. Finally, the workshop organizers held an additional moderated discussion on issues surrounding U.S. security-focused engagement on disease in Africa. In particular they asked the participants to consider the following questions:

4 Though the participants considered elements of several of these questions during the discussion period, the discussion that actually emerged did not specifically focus on these questions.
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- Which security dimensions can be addressed through U.S. engagement over the long-term? What issues must be considered? Are different strategies required for each disease category? How do they intersect?
- Some areas where the United States might engage over the long-term with its security apparatus include addressing African military capacity, assistance with disaster response, and providing access for humanitarian health aid. What are some issues that should be considered in each of these areas? What other areas might be included?
- What role might AFRICOM play in this engagement over the long-term, if any? Where might other U.S. players contribute? How might the United States partner with others to address security and disease? What are some issues associated with these partnerships?
- What are some issues that must be considered when determining how U.S. security-focused strategies fit with those focused on health and development to create a complete engagement strategy?

After the working session, the paper authors were given an opportunity to refine their analyses based on the feedback that they received from the other participants and from their own impressions stemming from the day’s discussions. The project team drafted this report to summarize the broader findings of the group.

Meeting the Objectives: Difficulties and Successes

Success: The organizers were successful in convening a highly respected small group of experts who have analyzed the security dimensions of the disease threat in Africa and who could consider the nature of the threat and response options.

Discussion: The majority of the participating experts had extensive experience conducting highly-respected academic research efforts on various aspects of the disease problem in Africa. Most had focused this research on the security dimensions of the disease problem, though several experts also had a public health background and conducted research in that area, and therefore were also able to approach the problem with a health lens. This duality allowed for a fuller discussion of the points of intersection between health and security issues. Some of the academic experts had also conducted studies on the global dimension of disease threats. This allowed for a full discussion of the analytic complexities associated with studying disease threats in any region, including Africa. This brought the discussion to a higher level.

The participants that did not have extensive academic research experience in this area had extensive experience on the ground in Africa conducting disease response activities in coordination with the U.S. Government and/or several international organizations. In one or two instances, the participants brought both academic and on the ground experience to the table, which allowed for an easier transition between discussions of theoretical matters and discussions dealing with on-the-ground practicalities. Given this level of knowledge and experience, the discussion about the nature of the disease threat – both its root causes and effects – as well as what is needed to respond to it, was quite detailed and nuanced.
Though the participants represented a variety of public and private institutions (some of which do research for governments and some that do not), most participants were well experienced in considering implications of the disease threat for government engagement and discussion proceeded much further along that line than it had at the October 2008 broad academic workshop. Overall, the experience pointed to the value of this sub-community of researchers adept at discussing implications of security issues for U.S. engagement.\(^5\)

**Difficulty #1:** Future dimensions of the security and disease problem were not heavily discussed.

**Discussion:** The participants agreed that disease impacts and is impacted by the African security environment today. Given that there were many dimensions to today’s threat to discuss, the participants did not generally consider how the threat might change over the long-term and the various implications of those possible changes both to the nature of the threat and the capabilities needed to respond to it. A portion of the agenda dedicated to a focused discussion on future potentials might have proved valuable.

**Difficulty #2:** Due to the multi-dimensionality of the disease and security problem in Africa, even if it is only approached through a security lens, the participants could not discuss every dimension to its fullest extent.

**Discussion:** Though the discussion covered an array of issues central to understanding the security dimensions of the disease problem in Africa, it was impossible to cover every issue or dimension to its fullest extent in a single day meeting. In hindsight, an entire day could have been spent on each disease category and/or dimension of the problem. Therefore, there might have been some value in a multi-day event. If a multi-day working discussion session was convened, more disease categories should have been included in the agenda and discussed. Case study analyses may have also been considered to ground the discussion.

\(^5\)However, given the uniformity, it did not allow the project team to further refine its methodology on how to best conduct government and academic dialogue on security challenges, particularly when it involves those academics who have an exceptional understanding of the particular challenge, but not on government engagement issues.
SECTION 3: OVERALL THREADS OF DISCUSSION

There was considerable agreement on the importance of disease in shaping and being shaped by the African security environment, though every expert cautioned against applying a security lens to all dimensions of the disease problem as not every dimension is a security-one. If a security lens is employed to study the problem, several participants thought that the resulting analysis should, perhaps, incorporate both a national security perspective and a human security one. One participant postured that Republican Security Theory may be useful to bridge the gap between the two focus areas.

Besides the “securitization” of disease, the discussion centered on some of the other underlying challenges associated with doing this kind of analysis not only as it relates to Africa, but also to other regional contexts. In this discussion, the participants observed the complex, non-linear, and emergent cause and effect relationship between disease and security and noted that both the cause and effect elements of this relationship need to be considered. The participants underscored the importance of doing this kind of analysis, despite the complexities, as it informs the identification and response to problems at a practical level. However, data availability issues can impede the development of such analyses.

Several themes emerged in the discussion of the security dimensions of the disease problem in Africa. Just as unstable situations can drive high rates of disease in Africa, so too can the aggregate burden of disease in turn affect stability. Indeed, it was widely understood that the burden of disease has a great effect on political, military, economic, and psycho-social stability in Africa. However, it must be understood that disease is not the only threat to such stability and any study of its impacts must also acknowledge other variables, stressors, and factors which shape stability and the context of these effects (the particular region, state, or city, for example). Several experts agreed that disease is rarely the sole tipping point for collapse and destabilization in most African contexts even over the long-term, though its impact on stability must be acknowledged. The relationship between conflict and disease is also important in the African context. In particular, this relationship is one example of the need to consider both the cause and effect elements of the relationship.

In particular, there may be a relationship between the aggregate burden of disease and state stability in Africa. High rates of disease can function as a stressor to the already brittle government institutions in Africa. While it is unlikely that high rates of disease alone can cause a state to become destabilized, the possibility of disease acting as a tipping point should not be ruled out in all cases. It is also possible that high rates of disease can impede the democratic transition process, given that these high rates would make it more difficult for those charged with doing so to develop effective institutions (due to personnel absenteeism, lack of citizen involvement, etc.).

Likewise, the impact of disease on African militaries needs to be examined. High rates of disease erode military capacity. As militaries interact with civil populations, personnel can also inadvertently or deliberately act as vectors of transmission of certain diseases, including, but not limited to HIV/AIDS, which results in a broader impact, both in terms of the health
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of the general population, but also, in the case of the disease being deliberately transmitted, affects the course of a conflict or perceptions and attitudes toward the military. It is important to recognize, however, that disease not only affects African state military forces, but also other peacekeeping forces engaged in Africa; high rates of disease within these forces also impacts their capacity and prospects for peace.

The economic effects of disease also need to be examined. The participants observed that poverty drives disease in Africa, and parasitic diseases, in particular, largely affect the poor. When the poor contract such debilitating diseases, they are unable to work. Thus, their economic productivity decreases, and the gap between the wealthy and the poor widens over the long-term. However, some diseases affect all socio-economic classes in Africa, and the broader effects of sickness can be observed at both a micro and macro level. At a macro level, high rates of sickness impact actual or potential prosperity and the production of human capital over the long-term. At a micro level, high rates of sickness in a certain company or economic sector can result in economic shifts and loss of actual productivity or potential productivity within that company or sector. High rates of sickness may require companies to hire several people for each position due to high rates of absenteeism. In some cases, entire workforces may experience attrition (such was the case of teachers with HIV/AIDS in South Africa for a time). At the same time, high rates of sickness may result in the occurrence of economic substitution (for example, when illness leads to death, the casket industry may flourish).

Psycho-social effects of disease can also be observed. The participants discussed two such effects – the high rates of fatalist attitudes and behaviors within affected populations and urbanization. While there was some debate as to whether fatalism was most associated with orphans or if it was a more general phenomenon, the potential for those affected by diseases to become exploited and engage in behavior that could be considered deviant due to loss of hope or prospects may be observed. Some deviant behavior, such as a person with HIV committing sexual crimes, can in turn impact disease rates. In terms of disease driving urbanization, several things need to be examined, including how sickness may drive those in the agricultural sector in rural areas to move to the city due to them being physically unable to do their jobs. Likewise, large concentrations of people in cities can also result in higher disease transmission rates (particularly of acute infectious diseases) in a given area. In this context, the favored community and/or village-based disease intervention programming may not be as possible as in rural areas.

The participants also cited a close relationship between disease and conflict in Africa. Focusing on issues such as violence causality, the impact of refugee situations, and the particularities of post-conflict situations, the participants observed that disease is both a cause and an effect of conflict. It was noted, however, that the type of conflict (whether intra-state or inter-state) may be important in determining the nature of the relationship. The participants agreed that the nature of this relationship, in particular, is an area requiring further study.

The participants also agreed on the importance of African perceptions of disease and responses to it in shaping the way the problem is addressed, if at all. The way a particular African government characterizes the disease problem, including whether it is defined as a security problem or not, impacts the way it responds to the problem (if at all), and whether it
engages with other partners to address the problem. There was widespread agreement that
government accountability, capacity, and political will impact disease characterization and
response processes.

Several other Africa-specific factors must be understood when international partners are
developing strategies to engage on the disease problem. African social norms and the
complexities of co-morbid situations also need to be understood. For instance, deeply-
embedded expectations regarding African male behavior and the role and place of women in
Africa will shape the form and effectiveness of engagement strategies focused on
HIV/AIDS problems. Single disease-focused engagement strategies might also not be very
effective in reducing the aggregate disease problem in Africa as co-morbid situations are the
rule rather than the exception. Multi-faceted response plans may be required given the
complex, multi-factor nature of the disease problem.

The participants agreed that the United States has a role to play in addressing disease issues
in the region through health and security-based engagement. Overall, the experts suggested
that the United States might expand existing programs and initiatives and further its
engagement in several areas: developing public health infrastructure; developing disease
surveillance mechanisms; and conducting locally-based disease prevention or intervention
programs, as all would have benefits that would contribute to improvements in African
security. They acknowledged that several things are required for the United States to
effectively engage on these issues, which include: an understanding of African perceptions of
international involvement on these issues; and an understanding of the challenges associated
with, and yet the importance of, getting African buy-in and partnership to implement
programming about a national, provincial, and local level. The fundamental principle that
instant results are not always possible when responding to disease problems and that
sustainability is required should also inform all planning on how to engage in Africa.

The need to have African partnerships was also emphasized to ensure success of all
initiatives, but the participants also highlighted the importance of the U.S. Government
considering partnering possibilities when formulating strategies and implementing them.
Partnerships with international organizations, NGOs, and African governments and
communities should not be ruled out (in fact, all opportunities should be investigated, as
partnering generally adds value), but the United States should be well-informed of the
challenges and issues surrounding all types of partnerships before it enters into them.

Within the U.S. Government, interagency coordination is crucial and successful “whole of
government” programming requires a good understanding of what each player can
contribute to develop a response and to determine where each player most adds value. The
U.S. military through AFRICOM can provide a supporting role in several areas (including,
but not limited to, logistics support), though further discussion is required to determine the
constraints it faces when engaging on these issues, due to it being a military organization
(and therefore, making it potentially not the best entity to engage effectively as a lead on civil
population health issues), the assets it has, and its mission and priorities. Generally
speaking, determining what is and what is not a security issue is crucial to determining how
the U.S. military might engage on these matters.
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A Note on the Organization of the Summaries

As stated previously, Frederick Burkle and Andrew Price-Smith presented draft papers and Patrick Lammie offered a presentation to ground the broader discussion. The papers or slides in their final form are available in the appendix of this report. As many of the issues raised in these presentations served as seamless catalysts for broader and interwoven discussion among all of the meeting participants, the authors of this report have chose to incorporate these prepared insights into the broader summaries of the discussion, which is organized topically, rather than present summaries of the presentations in and of themselves.

Additionally, though these summaries do not reference the specific recommendations from the participants on how each author could improve the draft papers, they do address all issues that were considered in the meeting. In a majority of cases, the discussion points are not presented in chronological order as participants jumped from topic to topic. For ease of reading, topical organization is the rule rather than the exception.

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6 Although the presentations were each focused on a particular disease category, this summary is organized along broader thematic lines, not necessarily disease categories.
SECTION 4:
DISCUSSION SUMMARY – THE NATURE OF THE DISEASE AND SECURITY RELATIONSHIP IN AFRICA

The Details: Complexities Associated with Analyzing Disease and Security

Although the discussion was generally grounded in Africa-specific analysis, the participants highlighted several broader issues which may impact how security and disease issues are analyzed in the Africa context. All participants agreed on the importance of these issues and highlighted some analytic challenges which need to be overcome. These challenges span the three major disease categories – HIV/AIDS and tuberculosis, acute infectious diseases, and parasitic diseases – covered in this working group discussion session. They include: coping with issues surrounding the securitization of disease; determining the best analytic lens with which to study the issue; understanding the importance of context; distinguishing between disease categories and their related causes/effects; dealing with data and research availability issues; and dealing with cause and effect relationships and emergent properties.

Securitizing Disease

Because the starting point for this discussion was that disease is a security issue (in addition to being a health one) and should be treated as such, there was no debate on the fundamental need to consider security dimensions of the problem in analyses at this particular meeting. In his paper, Price-Smith noted that the idea of examining disease with a security lens is not a new one. He cited that this kind of analysis can be traced back to Italy’s response to the plague in 1348. As such, the kinds of questions security researchers are examining relative to disease issues are not new ones, though researchers in this field of study face many of the same challenges others in emerging fields face.

One of these conundrums is determining when it is appropriate to examine disease with a security lens. As one participant highlighted, this relates to answering the question “are all diseases threats to security?” Many participants agreed that it was imperative to avoid categorizing all pathogens as threats to security. Doing so broadens the claim to such a level that it becomes very easy for naysayers and those charged with responding to the problem to dismiss its importance. Additionally, participants raised the need to determine how security is being defined (that is, is the focus just national security; just human security, or both?).

Related to this is the debate on whether child mortality is a security issue. When discussing his paper, Price-Smith noted that most researchers focused on security and disease limit their analysis to adults. Many focus on the impact of disease on military capacity and strength. However, it could be acknowledged that child mortality could have a long-term and future effect on state legitimacy. For example, research from the State Failure Task Force (now “Political Instability Task Force”) indicates that infant mortality rates are the one of the single greatest predictors of state failure as they illuminate the general level of deprivation and the presence (or absence) and state of infrastructure in an area. Likewise, the United Nations and other organizations use this as a gold standard indicator of economic health.

7 More information on this task force can be found at: http://globalpolicy.gmu.edu/pitf/.
Additionally, if children are dying from diseases, it is possible for the citizenry to determine that the state is not providing for its people and its loyalty to the state may decrease. One example of this happening might be found in the recent case of the cholera outbreak in Zimbabwe. A plausible question to ask is whether the lack of response to the outbreak lessens the legitimacy of the Mugabe regime in the eyes of the populace. This issue could be examined with a Republican Security lens (see next section) as an argument could be made that child mortality is both a human and national security issue.

**Determining the Right Analytic Lens**

Another challenge, as Price-Smith highlighted in his paper, is determining the best analytic lens with which to study the issue. Price-Smith suggested that until recently most security-focused researchers have either examined the social, political, economic, and cultural factors associated with disease through a human security lens or a national security one. This requisite choice was largely dependent on their particular preferred theoretical school of thought. Using the case of HIV/AIDS and to a lesser extent tuberculosis in Africa, he demonstrated how Republican Security Theory could be used to bridge this analytic gap and allow for a more complete and cohesive analysis of these factors. This theory stresses the need to connect humanity with the national security dialogue (focusing on the relationship between state stability and economic productivity of the citizens). David Deudney suggested this theoretical paradigm in his book *Bounding Power: Republican Security Theory from the Polis to the Global Village* in which he reminds readers that the state should not be privileged over the people. In that same manner, national security cannot be achieved without recognizing the people and attending to their well-being.

**The Importance of Context**

Yet another challenge raised by Price-Smith and echoed by Burkle in his paper, relates to recognizing the importance of context. It should be assumed that different pathogens result in different manifestations of disease. These manifestations can vary according to the wealth level of a particular society, geography, or climate. Each of these diseases has varying effects on society and these effects, some of which are security-based, can also vary from society to society. As an example discussed in Price-Smith’s paper, Severe Acute Respiratory Syndrome (SARS) generated a lot of fear among the affected populaces and most of the damage from the disease was related to fear as opposed to actual levels of morbidity or mortality. HIV/AIDS, however, has a different profile. Most of the damage from the high rates of this disease in Africa stems from the effects of the disease, Price-Smith suggested, not fear. In Africa, one effect of the disease is loss of productivity. There was general agreement that context is important. Even within Africa there is a lot of variation between regions and countries – these variations even exist within countries – and analyses should reflect this. For example, a certain disease may be prevalent throughout Africa, but the actual morbidity and mortality profile of the disease may be drastically different between countries. As such, the participants encouraged more case study-based research to determine what these profiles are and how and/or why they differ, in addition to more research on each disease category.
Availability of Data and Research Issues

A fourth issue relates to the availability of data and research on the security (and health) dimensions of disease in developing countries, many of which can be found in Africa. As Burkle noted in his presentation, a plethora of researchers are currently focusing all of their energy on HIV/AIDS because funding is available in this area. Burkle noted that some of these researchers had previously focused on acute infectious diseases and were pushed to shift their attention to HIV/AIDS due to changes in funding availability, thus resulting in a gap in research on acute infectious diseases. Another participant noted this same gap in research on parasitic diseases. The participants highlighted the need to conduct quality research both on epidemics and endemic diseases which have been imbedded in a certain region for a long time.

Data about disease rates in Africa are also lacking; this information is required by both researchers and practitioners/responders. One expert suggested that this gap relates at least partly to the collapse of public health infrastructure in the region. If these institutions cannot provide data (or can only provide incomplete data), it is nearly impossible to know or understand the depth of the problem requiring intervention and response. Another expert agreed with this assessment but cautioned against treating the issue so simply. He said that even if the infrastructure is in place, some governments may be afraid to capture the data for their particular state. If they have the data and therefore have a better sense of the depth of the problem, they might be required to do something about the problem even though they may not have the will. Therefore, ignorance may be a better alternative for some. Another expert further suggested that there is no international health requirement in place to ensure governments collect and provide these data. Sovereignty issues need to be acknowledged and understood in this context. As yet another expert suggested in most cases, if collected, these data are treated as “secure information” and are not widely shared.

The participants, however, agreed that overcoming these data issues are not only crucial for the research community, but also the practitioner/responder one. Data acquisition difficulties are not limited to researchers, but larger organizations such as the World Health Organization also face them and have to cope with incomplete data sets. Another expert echoed the hugeness of the data problem. He stated there was no obvious solution to it because the challenging dimensions of the problem are not limited to access-based ones. It is also important to remember that collection activities are rigorous and time consuming and there are not many incentives to engage in these activities.

Cause and Effect Relationships and Emergent Properties

The participants generally agreed that any analysis of disease and security cannot just focus on the cause or effect element of the relationship. Further, as one expert noted, this is a non-linear problem, there is really no simple cause or effect relationship between them. Even though the relationship is far from simple, the participants stressed that both causes and effects must be considered in any analysis and a mutual relationship between high rates of disease and political, military, economic, and psycho-social instability must also be acknowledged. For example, just as poverty may drive disease in Africa so too may disease drive more poverty. It is for this reason a vicious cycle has emerged. Therefore, any response to the disease problem must be multi-faceted and address all of these variables,
many of which intersept. The differences between the various disease categories (both their causes and effects) as well as societal context must also be understood and factored into responses.

Likewise, emergent properties should be acknowledged, as one expert noted, to understand the nature of the disease problem and develop responses to it. As Price-Smith noted in his paper, it is possible that disparate variables may combine in an unusual way to produce a particular situation. This situation may be different than what would happen if only one variable was at play. Disease occurs when multiple factors combine in different ways. So, when looking for breaking points to address the problem, including the security aspects of it, it is difficult to simply attack one factor like poverty alone will not likely result in disease eradication in the aggregate. More broadly, fundamental questions such as how can one reduce war and conflict; how can one change social norms and belief structures; how can one generate political trust; and how can one give women more rights may need to be asked when forming an understanding of disease and identifying ways to address associated problems. There is no one easy answer to any of those questions.

The Details: Security Dimensions of Disease in Africa

As noted previously, it was generally acknowledged that any discussion of disease and security in Africa cannot just focus on the causes or effects of disease. Although the discussion that emerged at this meeting rightly focused on both of these elements (often simultaneously), several themes and lines of thought emerged about the “security-based” dimensions of disease individually. Although every expert at this meeting had their own view on the importance or primacy of various dimensions, the experts generally shared the view that due to the non-linear nature of the relationship, no solution would be easy or apparent. In addition to broadly considering the political, military, economic, and psycho-social dimensions of the disease problem with a security lens, the participants discussed the broad relationship between diseases and conflict in a more in-depth manner. This discussion in particular highlighted the analytic complexity and the need for dual focus on causes and effects.

Political, Military, Economic, and Psycho-social Dimensions of Disease in Africa

Just as unstable situations can drive disease in Africa, so too can disease affect stability. Indeed, it was widely understood among the participants that the burden of disease has a great effect on political, military, economic, and psycho-social stability in Africa. However, it must be understood that disease is not the only threat to such stability, and any study of its impacts must also acknowledge other variables, stressors, and factors which shape stability. Further, the context of these effects (the particular city, state or region, for example) must be understood. Along this line, Lammie noted in his presentation that it was unclear whether targeting disease alone, for example, would result in alleviating poverty in Africa and increase stability and security. Several experts agreed that disease is rarely the sole tipping point for collapse and destabilization in most African contexts even over the long-term, though its impact on stability must be acknowledged. The relationship between conflict and disease should also be acknowledged and understood in the African context.
Political

There was widespread agreement that high rates of disease among the citizenry alone could not likely render a state unstable. At the same time, there was also ample agreement about the possible existence of a relationship between the aggregate disease burden and state stability in Africa. However, most of the experts cautioned against making a direct link between the presence of high rates of disease as a single variable affecting state instability.

As Price-Smith noted in his paper, the aggregate burden of disease functions as a stressor on state stability. The aggregate burden of disease can threaten the democratic stability and security of a state because it overwhelms the state’s institutions, rendering them hollow and sclerotic and making them more brittle and even more ineffective. In Africa, this is extremely problematic because the institutions already, in many cases, are brittle. High rates of disease can also diminish the power and cohesion of the state at large and, in extreme cases, contribute to state failure (generally when combined with other factors). However, generally, the potential for disease being the primary tipping factor for state destabilization and failure is relatively low. Other factors must be examined and disease, along with those other factors, influences the level of stability. It is not, however, out of the realm of the possible for disease to act as a singular tipping point, Price-Smith suggested, noting that some experts are arguing that pandemic flu in Africa might be able to “cause” destabilization.

Disease can not only impact the capacity of an already existing democratic government, but can also, as Price-Smith suggested, impede the development and consolidation of democracy and the formulation of democratic government institutions in a state or groups of states which are seeking to transition. If a society or societies that are undergoing this democratic transition face an overwhelming burden of illness, it is unlikely that a workforce equipped to establish and sustain these institutions over the long-term will be available.

Military

A well-researched area in African studies is the effect of disease on one particular institution – the military. Stefan Elbe and Robert Ostergard, in particular, have analyzed this relationship, focusing primarily on the effects of HIV/AIDS. Andrew Price-Smith put this relationship in simple terms, suggesting that if troops are too sick, then a state’s military capacity is eroded. Additionally, since troops carry the diseases with them, this can also influence how the troops respond to conflict. That is, the troops can deliberately or inadvertently function as vectors of transmission of HIV/AIDS in particular, but also other diseases. In this context, Price-Smith highlighted Andrew Cliff’s and Matthew Smallman Raynor’s geography-based research which indicates that conflict is a driver of the spread of disease. Although this research was not focused on Africa specifically, Price-Smith noted there is reason to believe that this notion applies to Africa. Specifically, these researchers...

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8 The question of regional dynamics was also briefly explored. Price-Smith, for example, argued that while it is possible that widespread disease could change a regional balance of power, the currently available data does not suggest that this is actually occurring in Africa.

suggest the distribution of troops corresponds with the distribution of HIV/AIDS-infected people. Given this relationship, the cycle of disease and conflict may be difficult to break.

The impact of disease also transcends the state-based military. It can also, according to one expert, undermine local and regional peacekeeping capacity. Citing Operation Blue Crane in the 1990s as one example, he remarked that the HIV rates within the peacekeeping troops were so high that external forces needed to be called in to assist with the peacekeeping duty. Like the state military personnel, peacekeepers can also likewise, serve as vectors of disease transmission. As peacekeepers interact with the civilian population (just as state-based militaries do), more civilians can contract diseases, changing the disease profile for that region for the worse.

**Economic**

The economic dimensions of disease were a source of much discussion among the experts. Several experts stressed the importance of socio-economic status in determining which classes are most affected by certain diseases. As one expert suggested, the aggregate burden of disease falls disproportionately on the lower classes, which account for the majority of Africans. Indeed, related to this point, Lammie indicated that neglected tropical diseases (NTDs) (some of which are parasitic) were widely known as the diseases of the poor or the “bottom billion.” To this end, he opined that given this possible causal relationship, targeting poverty in Africa might alleviate this particular disease burden, which is prevalent in the region.

However, high rates of disease impact overall poverty levels in Africa in the short and long-term. Price-Smith contended that disease exacerbaties existing economic inequities between classes in Africa. Lammie agreed with this and provided a specific example. NTDs are generally debilitating to the point that the poor Africans who have these diseases cannot work and thus are not economically productive and face even worse poverty when they become sick. Even though these diseases do not kill, so many people have them, so there are great implications for economic productivity and growth in Africa. Poverty levels increase within the lower classes affected by these diseases and as Price-Smith suggests, class inequities then widen over the long-term.

However, it was generally acknowledged that disease is not only a problem for the lower classes in Africa. As one expert noted, although the elite in Africa are less vulnerable to diseases like malaria (as they can afford and have ready access to preventative measures such as bed nets), it is incorrect to suggest that they are immune to disease. Economic productivity levels within the elite classes are also impacted by disease rates. HIV/AIDS, for example, affects all classes. Further to this point, another expert offered an example. Teachers in South Africa are generally among the more affluent in that society and were one of the first groups hit by high rates of HIV/AIDS diagnoses (perhaps in part due to the deeply imbedded social expectation that wealthy African males will have multiple sexual partners) and some attrition occurred. However, some other experts cautioned against putting too much emphasis on disease diagnosis writ large, but instead suggested focusing on illness. Unlike parasitic diseases and acute infectious ones, it is possible to adapt to an HIV/AIDS diagnosis because in most cases, those who are diagnosed are not already debilitated to the point where they are unable to work. Furthering the discussion on this
point, one expert surmised that many Africans continue working after they are diagnosed with HIV/AIDS and keep on doing what they do until they fall ill, perhaps due to lack of access to and/or negative attitudes about the need for anti-retroviral medications. Therefore the expert cautioned against making direct connections between disease diagnosis and macro-economic productivity broadly speaking.

There are also broader impacts of disease on African prosperity more generally. As many are affected by debilitating illnesses at one time, this causes a great strain on companies, who struggle to keep a functioning workforce. Even in places like South Africa, as one expert anecdotally observed, companies have to cope with high levels of sickness within the workforce. They might need to hire four people to do one job given the high rates of absenteeism, a requirement which is not efficient for the company and impedes growth. Although the high rates of absenteeism are not all due to HIV/AIDS-related illnesses, some South African companies have sought to combat these realities by distributing anti-retroviral medications to their employees at no-cost to preserve workforces and avoid high rates of turnover.

High rates of disease also make it more challenging for Africa to achieve its potential economic prosperity over the long-term. As one expert observed, some African elites and foreign investors might not want to invest in Africa because they perceive the general population, many of whom are affected by debilitating illnesses, as being unable to work more than a few hours a day if at all. As such, they may decide against making necessary investments which would heighten the possibility for broad African development over the long-term because it’s unlikely the population could sustain the investments or leverage them effectively.

Diseases also impact the actual production or possible production of human capital. Parasitic diseases were cited, in particular, as hindering the production of indigenous human capital over the long-term. As children contract parasitic diseases in Africa, the hope for long-term economic development is also depleted. Citing Kenyan and Jamaican case studies as examples, one expert noted that when children in these areas were treated for hookworm, their academic performance in school also improved. Parasitic diseases may not kill, but they impede physical and cognitive maturation. If children are unable to develop ingenuity, this affects the generation of human capital over the long-term. This suggests that if today’s children in Africa are unable to develop the skills to contribute to the development of African economies, governments, and societies, then large-scale sustained development over the long-term is less likely.

Several of the experts noted the importance of looking at the microeconomic impacts of disease, in addition to the macroeconomic ones. As one expert noted, larger macroeconomic studies of disease impacts on the African economy miss the nuances of some of the problems associated with epidemics. Although one economic sector may shrink due to high disease rates, some others may flourish when the rates are high and the macro economy is showing signs of contracting. For example, in South Africa for a time, the coffin making industry was flourishing when many people started dying of AIDS. As another expert noted, this demographic shift is when economic substitution kicks in and transformation occurs. As such, micro-based (sector-specific) analyses may shed more light
on how an economy adapts with high disease rates than studies focused on macroeconomic indicators such as gross domestic product (GDP).10

Psycho-social

Other psycho-social impacts of disease in Africa were observed. The participants mainly discussed two of them: fatalism within the affected population and urbanization.

Fatalism

One expert commented that the stigma associated with a diagnosis can have a broader impact on the well-being of Africans, with those diagnosed being exploited and ostracized within society. One of the major phenomena discussed in the African context was psychological fatalism among those diagnosed with HIV/AIDS in particular. There was some debate on whether this fatalism is most associated with children (who may be infected themselves) who become orphaned due to their parents’ deaths from AIDS. One expert noted that Martin Schonteich’s research on the subject indicates that orphans comprise a growing population of disaffected youth who are looking for economic opportunities that may or may not exist in legitimate forms. Radicalization or criminalization of this population is very possible. Another expert cautioned against making the claim that orphans in Africa are becoming criminals and/or radicals. Indeed, although there is certainly potential for this group in Africa to become radicalized and/or criminalized, the actual data do not suggest this is actually happening in Africa today. Most of these claims are based on projections or anecdotes.

However, there may be a relationship, as this expert noted, between diagnosis and deviant conduct more generally. He noted an interesting situation in South Africa; there seems to be a positive correlation between the incidences of rape and HIV infection in the country. It seems possible that youth diagnosed with HIV (as well as perhaps others) are adopting a fatalist psychology such that they have no moral problem with committing crimes because they “don’t want to go out alone.” If the perception among the affected population is that “they have no future,” then it may be able to more easily rationalize this kind of deviant conduct. High rates of violence particularly against women, as another expert observed, due to this fatalist psychology can have broader implications for the future of women’s rights in Africa.

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10 Throughout the discussion some of the experts cited some other challenges with using GDP as an indicator of the economic impact of disease eradication initiatives Africa. As one noted, GDP can easily be skewed and does not generally reveal huge income disparities that exist between the rich and the poor in Africa, thus it may not be a useful overall indicator.

11 The participants also discussed the economic impacts of disease eradication efforts at both a micro and a macro level and noted several studies which have noted the economic transformation that takes place with eradication. At the macro-level, Jeffrey Sach’s data-based study on malaria eradication initiatives in Zambia suggested significant improvements in GDP and economic productivity. Likewise, Scott Barrer’s work on the return on investment figures associated with smallpox eradication initiatives is another example. At the micro-level, Nano Poku and Alan Whiteside have done research which indicates the economy does transform at a local level when a disease is eradicated.
Urbanization

The participants also debated whether endemic disease drives urbanization in Africa. Indeed, as Frederick Burkle noted in his paper, most of Africa’s population today does not live in rural areas. 67% live in urban centers. Although disease alone may not be the reason for this shift, Lammie noted the possible relationship between the two in his presentation. As noted previously, disease impacts economic productivity. In Africa, many rely on agriculture to meet their economic needs. When people in the rural regions of Africa become too sick to work in the fields (likely as a result of a debilitating NTDs), they may abandon their lands and move to the city where they will no longer be contributing to the agro-based economic sector. As NTDs are widespread, this may result in a broad shift in demographics. This shift may have great implications for agricultural productivity and exacerbate a food crisis, which in turn impacts/is impacted by poverty levels.

Likewise, as Burkle noted, greater population densities in certain areas may enable the spread of acute infectious diseases. He noted urbanization as a critical factor in the spread of these diseases. Indeed, it should also be acknowledged that when people move (whether internal to a particular state or across state or even continent borders), they bring their diseases with them. Migration, then, is also a critical factor in the spread of disease and the effects of the disease may exponentially grow. As another expert noted, it may be more difficult to develop and execute community-based mass disease intervention or treatment programs in African cities; whereas these programs have been effective in reducing effects of some diseases in non-urban areas.

Conflict and Disease

The participants also examined the relationship between conflict and disease, focusing on issues such as violence causality, the impact of refugee situations, and the particularities of post-conflict situations. Overall, this discussion demonstrated the importance of considering both root causes and effects of disease; the complexities associated with this type of analysis; and the need for more research in this area. Indeed, while there was agreement that there was a relationship between conflict and disease, there was some debate as to the particulars of this relationship. The specific causal relationship between these two variables remained unclear to the participants, but the discussion suggested that the nature of the conflict may be important when determining its relationship to disease rates.12

Causality and Violence

One of the major points of debate was whether disease generally foments conflict and if so, what kind of conflicts. Price-Smith argued, as Susan Peterson did, that disease does foment intra-state violence and foster internal instability in Africa. For example, if a state’s economy is constrained by high disease rates, the elite in particular will begin to compete over a diminishing resource pie. This may translate into conflict and struggles for power in some

12 Although the relationship between disease and conflict was broadly acknowledged and emphasized as important, one participant pointed out the grave mortality rates associated with disease in comparison to conflict. He suggested that globally, the ratio of deaths resulting from disease to those resulting from war is 10:1.
contexts (an exception, Price-Smith suggested, might be a state such as Zimbabwe). However, the data available to date does not suggest that this causal relationship extends to inter-state violence situations in Africa. It is for this reason that it is better to broadly think of disease as a possible function of conflict rather than a cause of it. Answering the question of “how can we reduce war and conflict?” may be necessary to address some disease problems in Africa. Another expert at the meeting, however, suggested that a new aggregated global data set (which includes Africa), which is still being analyzed, may indicate that intra-state conflict tends to suppress HIV transmission, while states that engage in inter-state conflict tend to have higher rates of HIV. This debate was left unresolved.

Refugees

Within the context of discussing conflict and disease, several experts also highlighted the intersection between refugee crises and disease transmission. Indeed, refugees can serve as vectors of transmission of disease, both within a state and across borders. As both types of refugees comprise a sizeable portion of the African population given the high rates of conflict, this phenomena needs to be explored. However, one expert strongly suggested against simply branding all refugees as vectors. With this branding, it is easier for certain governments to develop policies which would deny trans-border refugees entry into their particular state.

Indeed, in addition to the impact that general migration has on disease transmission patterns, the establishment of refugee camps – many of which can be found in Africa – also impact disease transmission patterns, and overall rates of transmission in a given area. As one expert pointed out, refugee camps are often very crowded, lack resources, and are not very well policed. This combination of factors often translates to high levels of crime. Crimes, including sexual ones, may be committed to secure the scarce resources available within the camp. As such, when refugee camps are established in Africa, data suggest that HIV/AIDS rates increase (a 2-4% prevalence rate). Disease transmission, however, does not cease when refugee camps break up. The inhabitants take the diseases with them. As Burkle noted in his paper, refugee situations don’t stop at state borders; there is a global dimension to this challenge. Indeed, he notes that 75% of all epidemics in the past 30 years have come out of Africa. While it would be inappropriate to suggest that this development is due only to refugee movement, it is a factor that should not be ignored.

Post-Conflict Situations

The experts also argued that the relationship between disease and post-conflict situations should be explored in the African context both at a causal and effects level. Lammie, for example, suggested in his presentation that when conflict wipes out public health infrastructure, disease resurgences are common. One example of this resurgence can be found in an increase in the rates of trypanosomiasis (sleeping sickness) in Central Africa since the 1970s. Prior to the initiation of conflict (and many military coups), this disease had been all but eradicated in the region. Additionally, it is important to recognize that long-term efforts to eradicate disease may cease during times of conflict due to infrastructure, resource, or access concerns.
The effects dimension must also be examined. Burkle noted in his paper that the possibility of returning to conflict is high in post-conflict situations especially when there are major health problems within the affected populace. Inadequate state capacity to deal with these health issues, as well as a lack of public health infrastructure, can factor into whether or not conflict resumes. The situation of post-conflict societies, as one expert stressed, is exceedingly important in Africa as there are more post-conflict situations today than actual conflicts.

**The Details: Issues Impacting Disease Perception and Response**

The participants also discussed several broad issues which will impact perceptions and security-based response to disease threats in Africa. These issues fall into two broad categories: African perceptions of and responses to the problem and context-specific social and health-based complexities. Although each expert had different views regarding the primacy of each of these issues, there was widespread agreement that these fundamental challenges must be acknowledged and understood when developing plans to engage on the security dimensions of the disease problem in Africa.

**African Perceptions of and Responses to the Problem**

Within the context of the discussion on the security-based causes and effects of disease in Africa, the participants acknowledged that several fundamental issues are at play in determining how African players in particular characterize and respond to disease problems. There was widespread agreement that general African perceptions of security and issues surrounding government accountability, capacity, and will impact disease characterization and response. Although addressing these issues is complex, as most are deeply embedded into African politics and society, they cannot be ignored when discussing the securitization of disease in particular.

**Impact of African Perceptions of Security**

There was widespread agreement that the nature of the African government, including but not limited to its structure, impacts how a disease problem is characterized, including if it’s characterized as a security threat at all. How security is contextualized and defined matters. As one expert noted, oftentimes, African political systems are predicated around one man who makes all of the decisions concerning the state. This is known as the Patrimonial Big Man Syndrome. It must be understood that one person’s perception of what is and what is not a security threat has great implications in Africa. Indeed, as another expert surmised, in Africa, the power often resides in individuals rather than institutions, which has broad implications for how disease problems are characterized and how responses are developed (if they are developed at all).
Government Accountability, Capacity, and Will

Although there was broad agreement that the characterization of disease as a problem (whether security-based or not) is context-dependent, the participants made some general observations about the centrality of the state government in shaping perceptions and responses to disease in Africa. Several variables must be considered when determining if and how a government will respond to widespread public health problems in an African state. The experts discussed how the degree to which the citizenry holds its government accountable, the level of capacity of the government, and the level of political will at play are important.

Government Accountability

One of the major issues in Africa is that the citizenry may be reluctant to hold its government accountable to provide for its health whether they are sick or well. One expert noted that a recent Afrobarometer survey asked people to indicate issues for which they held their governments accountable. Health did not rank at the top of the list of the issues the respondents cited as being immediate concerns. Generally, the highest priority issues were jobs and housing, which may indicate that the respondents rationalized the situation in the following way: “if I can’t get my kids into school or if I don’t have a job, or if I can’t obtain adequate housing, then why should health be a concern?” Another expert expounded on this point by suggesting that people really only see the effects of a weak government when it can’t provide jobs and housing to its citizens. In terms of overall economic stability, health has an invisible role in the economy. It is only when the health of a nation seriously diminishes that the effects will show up in the “coffers of the state” which, as another expert suggested, has great implications for foreign direct investment and aid practices.

Government Capacity

Government capacity levels are also intrinsically related to disease threat characterization and response. When diseases are endemic to a state or region, this may indicate a lack of government capacity to provide for its people, including the provision of public health infrastructure. As Burkle noted in his paper, the “capacity to control and eradicate endemic acute infectious diseases serves as a proxy indicator for chronic smoldering deficiencies in the basic public health protections while exposing gaps in public health surveillance, infrastructure, systems, governance, and human security.”\(^{13}\) Likewise, a lack of public health infrastructure and related disease surveillance activities, particularly those which are sustained, is not only indicative of a lack of government capacity (and thus instability), but also has broad implications for the security of the African citizen over the short and long-terms. These institutions are crucial to both prevent and respond to disease outbreaks and endemic disease situations. They are also crucial to provide sustained surveillance of outbreaks, including providing data to those charged with response so that that these individuals can truly understand the nature, depth, and extent of the situation.

\(^{13}\) In that regard, Burkle emphasized that increases or decreases in disease rates then can be indicators of successful or unsuccessful efforts to improve governance.
A related capacity problem is the lack of disease expertise. There is a lack of indigenous research-based public health expertise in Africa on some disease categories, particularly those which are endemic. As Burkle noted, those with expertise in this area have left Africa for other opportunities so there is a brain drain situation. There is no incentive to stay in Africa given the lack of economic security and provision of resources and infrastructure to support the conduct of research. Academic centers which previously conducted such research (and were a good source of data for responders) are now few and far between due to resource issues. Therefore, even if training is still available in epidemiology in Africa, once a person is trained, they have nowhere to go to do their research. This has broad implications, Burkle noted, for long-term response to disease problems in Africa. This on the ground expertise is needed to ensure understanding of the nature of the problem at all levels of society, and it is also necessary for effective coordination of response plans.

When the government can’t provide them, the citizenry have to look elsewhere for health services. In the absence of government-provided infrastructure, as another expert noted, NGOs or foreign governments may be perceived as the providers of such health services. This, in turn, can create long-term (perceived or actual) dependencies on these actors to provide these services and impede the development of strong, effective state-based institutions to provide them. This reliance has huge implications not only for the way disease threats are characterized and how response plans are formulated (if at all) within the government, but also on how the citizens perceive the legitimacy of the government and the degree to which they hold them accountable for their actions overall.

**Political Will**

Political will issues also come into play in determining how African governments characterize and respond to disease threats. They might place less priority on health matters than other ones. For example, as one expert noted, it could be claimed that most of the funding available to most African governments goes to the state military because the overwhelming African government view of security emphasizes military spending and development. Such funding, as this expert suggested, is allocated at the direct expense of health and education programming. Without a change in these practices, there is little chance of the governments developing and sustaining health infrastructure and this responsibility will continually be left for others, such as NGOs or foreign governments. This cycle of expenditure may lead to the abdication of indigenous African-government capacity to provide health and education programming over the long-term.

The experts suggested that resource and funding allocations are not the only determinants of the degree to which an African government will engage in activities to both prevent and respond to disease. As one participant emphasized, electoral timelines may impede government involvement and response to disease problems because the potential or actual

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14 This expert further noted the relationship between the primacy placed on the military in most African contexts and citizen perceptions of the government and attitudes about its legitimacy. This expert stated that many Africans perceive the military as an enemy of the government, the cause of coups, and an entity which is not accountable to the civilian government as a result of historical and contemporary experience. Therefore, these funding practices (at the cost of programs for the citizens) may perpetuate negative views about governments. Thus, as another expert suggested, a more fundamental question needs to be asked when looking at disease problems. That is the question of how to generate political trust.
pay-off for the politician is limited. Recently-elected African politicians may regard the disease problem as insurmountable. He or she might say, “I am not going to address this issue if I only have four years because there is no sense spending my limited time in office trying to respond to an impossible problem.” In the case of a government where multiple players influence or make decisions, another possible problem can be observed. As another discussant observed, in this situation attaining the adequate level of political will may be difficult if not impossible.

In some cases, there may be political will to address the problem with certain constraints. That is, some governments may conduct disease eradication programs (particularly HIV/AIDS-focused ones) with foreign or international organization-provided funding. While political will and leadership is central to conducting these campaigns successfully, one expert observed that many government claims that disease rates have dropped dramatically as a result of these campaigns need to be closely examined for veracity. In Uganda, for example, HIV rates have reportedly decreased from 30% to less than 10%. However, this may be due to several things. Researchers have noted that in addition to the possibility that creative accounting methods may have been used to get these results (due to outside promises for more funding if rates continue to decline) or that the campaigns were corrupt, it is also possible that the campaigns targeted certain populations where reductions in rates would benefit the government. This may include elites or others affiliated with the government. Urban areas may also have been targeted and rural areas neglected. In Uganda, for example, there is contemporary evidence that entire villages have been wiped out due to deaths from HIV/AIDS. Thus, the possibility that HIV/AIDS rates have leveled off in any African state due to death and prevalence rate equalization should not be ruled out. Another possibility is that HIV/AIDS transmission rates have not decreased, but people are being kept alive longer through programs that channel revenue (from natural resources, for example) into anti-retroviral medications for the population, such as the case is in Botswana.15

Social and Health-Based Complexities

The participants widely agreed that African perceptions of and responses to the disease problem in Africa is not the only factor which must be considered when developing and/or evaluating multi-actor response plans. Some other influences also come into play. These include African social norms and the complexities associated with co-morbid situations.

Social Norms

The participants observed several African gender-related social norms and values which may influence disease threat characterization and response within the region. They focused on such issues as deeply-embedded expectations of African male behavior and the role and place of women in Africa. There was broad agreement that when formulating responses to

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15 Within the context of the discussion on political will, the participants agreed that although Botswana has been used as an example of what great political will and leadership can do to reduce HIV/AIDS rates, Botswana should not be used as an African example of success given that its profile is the exception rather than the norm in Africa (it has a small population, is mono-ethnic, has long-standing functioning democratic institutions and a strong civil society; and has great diamond wealth, as one expert observed). As such, the experts cautioned that it is a statistical outlier.
curtail the spread of disease, particularly sexually-transmitted ones, one needs to consider the nature and importance of these fundamental social norms in informing the behavior of most African citizens. A question that remains is whether these norms and associated belief structures can be changed and if so, how, and who should do the changing? A related question is whether these normative issues need to be tackled first before instituting initiatives to tackle the actual spread of diseases or even prevent or eradicate them. Irrespective of the answers to these questions, the complexities and difficulties with “modifying” social norms (even if required to address disease problems) need to be understood at a fundamental level.

For instance, one expert observed that it is common for African males to have multiple sexual partners. Some might argue that this practice is even expected in African society; thus, the norm that shapes behavior will influence the degree to which and how the spread of diseases like HIV/AIDS can be tackled. The context for this practice is also shaped by (and shapes) the role of women in African society. Though there was some fundamental debate among the participants about the actual role of women in Africa’s patriarchal societies, this expert suggested that if these female partners do not have jobs and some power in their relationships with the males they are likely not going to be able to protect themselves from being victims of sexual coercion. Coercive acts are much more possible and prevalent under these circumstances. This power differential has broad implications then for controlling the spread of HIV/AIDS in Africa; as another expert observed, women’s empowerment initiatives may have some centrality in formulating disease policies and programs while transforming society. One way to deal with both of these issues, this expert suggested, was to bring women into efforts to develop public health infrastructure in the region.

Co-Morbid Situations

Although it was generally acknowledged that the underlying similarities and differences between the security-based causes and effects of various diseases in Africa must be understood, the participants also emphasized the need to acknowledge the centrality of the co-morbidity dilemma in analyses. Particularly, they observed that co-infections or morbidities, as Burkle and Lammie both noted in their prepared remarks, are the rule rather than the exception. Therefore, singular-focused disease response activities may not result in broad-based reductions of the disease threat in Africa. Multi-faceted response plans may be required given the complex, multi-factor nature of the disease problem. Possible points of intersection between health-based response plans and security-based ones also must be recognized.

According to Lammie, one example of this phenomenon is the idea that a person who has one type of parasitic disease is also likely affected by other parasitic ones as poly parasitism is
the rule rather than the exception.\textsuperscript{17} Although many of these diseases can be treated with the same type of health-based interventions (or bundled ones), it can be difficult, as Lammie lamented, to gain support for initiatives which target an array of disease types (for example, funding associated with U.S. programs to target malaria in Africa) can only be used to target malaria, not co-morbid hookworm.

The same problem can be associated with the construct and use of surveillance networks. A network focused on monitoring rates of HIV/AIDS, as one expert suggested, may not provide information on co-infections or morbidities even though they are common, or be adequately linked to others. Although these are clearly health-related challenges, a security dimension can also be identified. If the co-morbid situation is not addressed, any surveillance activity and intervention on the health side is likely to be ineffective overall. If these activities are ineffective, the health problems many Africans have will persist, and this will in turn have broad security implications.

Another issue must also be examined along a preventative and response-based line. As Lammie noted, new evidence suggests that HIV is more prevalent among women with schistosomiasis in Africa. Therefore, this begs the question as to whether targeting young girls to treat schistosomiasis would result in lower HIV rates. Gender issues would have to be examined, as Lammie observed, in developing the right kind of response to this complex, intersecting problem.

\textsuperscript{17} For example, Lammie noted that hookworm and malaria is a common co-distribution. A single intervention, such as one focused on treating a patient’s malaria does not achieve the same results as one that addresses the hookworm too. Co-morbid anemia is also common when a patient has these diseases.
SECTION 5:
DISCUSSION SUMMARY – ENGAGEMENT ISSUES

The participants acknowledged that the United States and the broader international community are currently developing and implementing initiatives to address the health and security dimensions of the disease problem in Africa. They agreed that in most cases, partnered activities (i.e. those involving multiple actors, including but not limited to the Africans themselves), provide the most benefit. They cautioned that several fundamental issues must be acknowledged when determining the role and actions of international partners in Africa. They offered several Africa-specific issues which could impact the success of these initiatives involving any international partner and also specifically discussed some fundamental principles which should inform a U.S. disease engagement strategy in Africa.  

Delving more deeply into what some of the components of such an U.S. strategy might be, the participants cited three areas in which the United States might further engage either in concert with other partners or as a unitary actor. These areas include the development of public health infrastructure; the development of disease surveillance mechanisms; and the conduct of community or village-based disease prevention or intervention activities. They identified what this support might entail and which entities might be involved in executing the activities. The broad consensus was that a conscious effort should be made within the U.S. Government to leverage existing efforts, initiatives or activities to address these gap areas and in some cases, extend them. In some cases, this support could involve the U.S. military, through AFRICOM, though some fundamental issues involving U.S. military engagement on civil public health matters, in particular, need to be acknowledged.

The Details: Issues Surrounding Engagement in Africa

The participants agreed that Africa generally may require assistance from external parties (states, NGOs, and international organizations) in developing African solutions to African disease problems (both the health and security dimensions of these problems given they are intrinsically related). Within this broad discussion, several experts identified issues which could impact the success of this partnership. It is important to understand how domestic perceptions of international involvement can shape the success of initiatives to reduce disease threats. It is also important to understand the importance of obtaining African buy-in to initiatives, and recognize the challenges, drawbacks, and positive effects of obtaining and leveraging that buy-in.

Domestic Perceptions of International Involvement

As one expert noted, perceptions of international involvement play a substantial role in determining the success of specific threat reduction initiatives in particular regional contexts. In cases where African domestic populations do not have positive views toward the engagement (including the motivation to for doing it), the initiatives are less likely to be successful in both engaging the Africans and actually providing benefit to them. Therefore,

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18 It should be noted, however, that many of these principles have broader applicability and utility beyond the Africa engagement context.
these issues must be understood before external partners develop initiatives and, further, the understanding of these issues must continue to inform decisions once a program is initiated.

This expert cited one example where domestic attitudes about non-African partners and their activities within Africa may have hindered the success of a disease eradication program. In Nigeria, many externally-funded programs have been attempted to eradicate polio. In these instances, the domestic population in that country generally viewed these efforts not as ones focused on eradicating the disease, but as attempts of non-Africans to sterilize the population. This experience suggests that when an external entity is seeking to assist a state government in addressing a disease problem, that entity needs to consider the best way for it to support the achievement of a particular goal. It needs to identify the best role to play to provide support to the African state without being viewed as an outside dominator. Figuring out this role, and more fundamentally determining how the population affected by the problem defines the problem and how that definition is different or similar to the external actor’s view, would require consultation with African partners (both before an initiative begins and after it starts) and consultation with outside subject-matter experts on that particular ethnic group, country, or region. This discussion element should be emphasized.

**Issues Surrounding African Buy-In for Externally-Based/Funded Initiatives**

More broadly, the participants underscored the importance of attaining African buy-in for externally-based or funded disease threat reduction initiatives, whether these initiatives are security based or not. The context of the initiative, however, will determine the nature of the partnership and how it is formed. In some cases, partners can be NGOs and communities. In some cases, they can be local, district, or provincial governments. In yet other cases, they can be federal governments. In some cases, partnership with all of these entities may work and be beneficial for ensuring the programs reflect African values, reflect their perceptions of the problems (not just how the funder or sponsor perceives the problem), and are successful and sustained over the long-term.

These three cases were further examined in the meeting. One expert suggested that one may partner with an NGO (and by extension, a community) in particular when governmental capacities, political will, and – more generally – good governing practices are non-existent at all levels. In these cases, the sponsor or funder bypasses the African government completely and does not involve it in the program and goes directly to the community which needs the assistance. Working with the community may make these efforts more sustainable and generate long-term good will and local “ownership” of the program. However, the expert acknowledged that this option may be difficult to pursue when a foreign government is the sponsor or funder of a program due to standard diplomatic practices. In these cases, the foreign government (such as the U.S. Government) could assume a support role and let a NGO take the lead in developing the ties with the community and executing and sustaining the program.

However, in some cases, this expert observed, although weak or bad governance issues (including, but not limited to, corruption) may exist at the African state level, the local or provincial level (or as another expert suggested, the district level) of government may not be plagued (as much or at all) by these kinds of issues. If this is the case, buy-in and partnership can be secured and implemented at this level. Engaging at this level, he suggested, not only
builds good will between both parties, but also increases the possibility that the initiatives will be supported and sustained over the long-term because there is a more direct incentive for them to ensure it is successful. He further suggested that funding is less likely to disappear when it is given to provincial or local governments than at the federal level in these instances. However, this option (as well as the previous NGO/community option), may perpetuate perceptions and/or attitudes about the lack of relevancy of the federal government, which can have broader political implications at both a domestic and international level.

While it was acknowledged that good governance issues do plague many African governments, one expert cautioned against external actors not involving those governments in any initiatives as partnering with them can have a secondary effect. He suggested that if a long-term overarching goal of an external actor is to achieve better governance in Africa overall, at some point, these actors will need to begin to engage with those governments on all or a majority of its initiatives. Emphasizing that reaching any good governance goal will require a ten or more year commitment versus two years of programming, he suggested that in the public health arena, these program funders/sponsors can give young African physicians (and others) opportunities to support its programs and thereby help them advance their medical knowledge and experience, but also teach them best practices in other areas such as leadership, human rights, democracy-building, good governance etc. In a relatively short period of time, these physicians can be ready for leadership positions in government ministries associated with public health armed with this knowledge and experience and can provide support for the initiatives at a more permanent and higher level. They can then pass “lessons learned” along to the next generation, leading to a long-term impact.

**The Details: Fundamental Principles to Inform a U.S. Engagement Strategy**

Throughout the discussion, the experts identified a set of core principles which should inform any form of U.S. engagement on the disease problem in Africa. They include:

- Do no wrong. If one does the right thing, one will win “hearts and minds.”
- If one is not in it for the long haul, do not get in the game. Instant results are rarely possible. Starting and then abandoning a project does more harm than good.
- When developing initiatives, one must understand and consider how these initiatives will be sustained. Addressing any dimension of this problem requires long-term engagement and some consideration needs to be placed on how long it will take to achieve the desired, measurable goal at the outset.
- One must ensure that “African values” including those held by minority groups, are protected when developing and implementing disease response initiatives. Traditional cultural norms, values, and structures must be understood and leveraged when developing programs at a local level. These include, but are not limited to, kinship structures.
- There is a need to form partnerships between those entities that have experience in both security and health matters; those who have the will to engage on the disease problem; and those that have the funding resources to address the disease problem. In all
likelihood, no entity has all of these attributes even within the U.S. Government. Thus, while interagency coordination is required, it may not be sufficient to achieve success. Other external partners, such as the World Health Organization, may need to be involved. Any initiative should allow each player to do what they do best. No problem can be solved with just funding.

- Partner-based programs can help accelerate what is already being done to respond to the problem at an individual level.
- Existing programs which are not specifically-focused on disease issues can be expanded to address these issues. Every effort should be made to leverage existing programs, including those which are sponsored by different parts of the U.S. Government.
- Ground-up initiatives have great value and should not be discounted.
- Africans need to be asked what kind of support is needed before any non-African investments start and programming begins.
- Any response will require investment in human capital at the community and local levels in Africa. However, these investments should not be limited to just Africans. The U.S. response community also requires long-term investment, including the development of military medical officers and the provision of a career path for them to keep them focused and able to address disease problems in Africa and elsewhere.19
- A starting point should always be identified when formulating programs to address a particular dimension of the disease problem. It is also important to identify possible areas for change as plans move forward. These should be adjusted throughout the development and implementation process.

The Details: Areas for U.S. Engagement

Developing Public Health Infrastructure

There was a consensus that public health infrastructure is lacking in Africa and this gap undercuts all disease categories. As this provides a necessary mechanism to help prevent and respond to diseases, the participants cited several ways the United States could address this need. One area involves defining the concept. One expert argued that determining what such infrastructure entails may not be equally obvious (or agreed upon) to the security specialist, the public health expert, and the average African citizen. He suggested that further research and analysis be done (primarily by public health experts, but also involving security experts, and broader African specialists and/or citizens) to identify what an ideal infrastructure would look like for a variety of African contexts. He emphasized that investing in the development or at least conceptual outline of such a model might be very useful to policy makers and planners in both the United States and Africa. Another expert

19 As part of this discussion, one expert observed these military medical officers are capable of working in multiple environments and suggested that the local populations may not attach negative perceptions traditionally associated with “a soldier” to these people. However, another expert cautioned that although the possibility that the local population will perceive this group negatively may be less, the possibility that the locals may perceive them as spies cannot be ignored and needs to be addressed if they are used in local disease response initiatives.
took this a step further and suggested this analysis should be part of a much needed U.S. strategic health plan to address gaps in public health infrastructure in Africa.

Data collection, likewise, is an important function of public health institutions. Without such functioning institutions, datasets are incomplete or non-existent. The United States, as part of its activities to develop such infrastructure, might use academic and international organization experts (such as the World Health Organization, as another expert observed) to train Africans to do these tasks. However, this requires an investment in both human capital and broader public health, medical, and academic training.

*Developing Disease Surveillance Mechanisms*

In this area, Burkle stressed the necessity of developing surveillance infrastructure to identify disease outbreaks and the development of emergency management programs to address African disease outbreaks. He emphasized that surveillance activities need to consider all disease types, not just those which have the highest impact on African militaries. Another expert echoed this point and suggested that given that there is a disturbing trend for responders to narrowly focus on HIV/AIDS and overlook endemic diseases in Africa, there is a need to ensure that any surveillance activity has a broader focus and includes all diseases, including those which are endemic.

The experts agreed that any surveillance activity will need to be sustained. One expert suggested that sustainment it is virtually impossible without available public health infrastructure; as such, investment activities in both of these areas need to be integrated. When these investments are being considered, the planners should, at the outset, think about sustainability. In that vein, they offered five ways that the United States could improve and conduct surveillance capacities in Africa over the long-term.

As part of his presentation, Burkle suggested that in Africa human disease surveillance infrastructure development and related outbreak monitoring activities are lacking in comparison to those focused on animals or food. While another expert cautioned against making too broad of a claim that veterinary surveillance levels are currently sufficient (he argued they were not and noted the crucial need of enabling such systems), Burkle observed that it could be useful to link all of these surveillance networks together to enhance and broaden the response framework. Therefore, currently existing animal and food-based networks could be leveraged to also monitor human outbreaks. Echoing this integration point, though at a broader level, another expert pointed out the possibility of surveillance efforts focused on particular disease types being integrated into the U.S. Agency for International Development’s Famine Early Warning System (FEWSNET).

One expert suggested that a cooperative threat reduction (CTR) spin-off program focused on virus threat reduction might be instituted in Africa. This kind of activity has achieved some success in places like Georgia as a long-term threat reduction option, and it could be modified to fit the unique African context. Instituting such an initiative would not only help broadly with developing a security-based preventative disease strategy in Africa, it would also help in developing a long-term, sustainable disease surveillance structure. However, for this to work, public health experts would need to engage with military/security experts.
Building on the need for military involvement, another expert suggested that the United States (possibly through AFRICOM) might involve African militaries in developing and sustaining a disease surveillance capacity, a process which would require training them and helping them build the capacity to do this over the long-term, which would in turn help in some way to address sustainability issues associated with externally-funded or sponsored projects in Africa. A secondary benefit would be that it would give the military something beneficial to do which promotes the security of the African citizenry. Given that the average African citizen may associate most African militaries with overthrowing governments and staging coups rather than providing for their security, this kind of involvement might help to address those larger, lingering, historically-based perception problems.

Building even further on the possible military role (though focused on U.S. military, not African ones), yet another participant suggested that AFRICOM could borrow a successful idea from the U.S. Navy and use the Naval Medical Research Units (NAMRUs) to conduct disease outbreak surveillance activities and monitor the management of them. AFRICOM could build on the U.S. Navy’s experience and leverage existing infrastructure, which translates into an almost immediate capability. He suggested that such units could be placed in Kenya and Egypt. Another expert cautioned against putting too much emphasis on U.S. military-based surveillance activities and again emphasized the need to involve Africans in contributing to and sustaining them. He offered that globally, he had observed tremendous resentment among scientists living in areas near NAMRUs as they are not often invited into these facilities and suggested a second look at involving local populations in these kinds of activities to build indigenous African capacity over the long-term.

Another expert echoed the need for involving the local population, not just the military, but civilians in developing a disease surveillance capacity. Suggesting a possible role for the United States in developing and implementing community level training and education programs in Africa, he emphasized that such programs could teach even an uneducated person in a village how to do disease surveillance in his/her village. Beginning at the local level has an added benefit in that once a person is trained in surveillance practices, they can also begin to learn skills to treat diseases and support existing disease intervention initiatives locally. Yet another expert echoed this point and suggested that such training could also take place in district level hospitals perhaps in concert with training to build disaster resilient communities.

**Conducting Locally-Based Disease Prevention or Intervention Programs**

The experts discussed the importance of local community-based disease intervention programming in Africa and the maximum kinds of health and security benefits these provide. As part of this discussion, Lammie cited one example of a United States Agency for International Development program which focuses on providing annual mass treatments for multiple NTDs to African villages. He emphasized that these public health-based efforts are conducted within traditional African cultural settings at a community or village level. Once a basic delivery mechanism is in place, international and local NGOs can be
used in each village to distribute annual mass treatments for multiple NTDs quite easily and at a low cost.\textsuperscript{20}

He suggested that these locally-based, Africa-specific programs provide several benefits which cannot be gained through non-community based programs. In effect, although U.S. Government, pharmaceutical companies, and international and local NGOs are all involved in sponsoring and executing the programs, the organizers in effect answer to the local community, which owns the program and provides local access and infrastructure to sustain it. Another expert also stressed the need for an “African face” to these programs, noting they are much more effective this way, particularly if the sponsors allow the Africans to take credit for them.

As part of this discussion, the participants considered how this form of health diplomacy can engage and empower a community and, as one expert suggested, increase good perceptions of the “outsiders” that sponsor them, including the U.S. Government. Another expert echoed this point and suggested that programs to distribute medicines to Africans would contribute to levering and improving perceptions of American soft power in the region. Given this larger security benefit, it may be beneficial to involve other U.S. Government players to contribute “value added” as appropriate to accelerate and promote these kind of activities on a larger scale. There was general agreement that these kinds of village-based activities are a good example of, as another put it, reaching “low hanging fruit.” If the U.S. Government can partner (internally and externally) to execute more activities in this area, some real measurable results can be achieved and broader benefits can be secured even with a small funding and time commitment.

As part of this “value added” partnering, another expert suggested that the U.S. Government could partner more with “on the ground” NGOs to build infrastructure to support community-based programs such as the ones aimed at eliminating NTDs. Its contribution could entail providing minimal funding as NGOs can make a huge impact on a small budget. Within this context, however, some discussions would have to take place on the challenges of having such an alliance, including conditions on the provision of funding, and determining which U.S. Government agency is best suited to provide it. Another expert took this discussion further, noting that something like the “joined up government program” in the United Kingdom could be used to authorize and appropriate these small funds within the interagency and facilitate implementation at an interagency level. He remarked that, historically, this program worked very well for the United Kingdom to conduct small projects in Sierra Leone.

\textbf{The Details: U.S. Military Engagement}

Within the context of the discussion of how the United States could engage on disease and security problems in Africa, the participants highlighted some specific possible roles for the military through AFRICOM. One of the major points of discussion was the degree to which the U.S. military can or should be involved in supporting these possible engagement areas.

\textsuperscript{20} U.S. pharmaceutical companies provide the drugs for this programming, and as the drugs have a 3-5 year shelf life, the logistics involved in getting them to the Africans at a local level are quite minimal once the basic program infrastructure is established.
Several major themes emerged within the context of this discussion, which have broader relevancy beyond the African context.

**Issues Surrounding U.S. Military Engagement on Public Health Matters**

There was broad agreement that military engagement on some public health matters is nothing new. As one participant noted, militaries throughout history have always been concerned with containing disease within their own ranks because high rates of disease will affect their capacity and capability to do what is required of them. Further, as another person suggested, most commanders realize that given the high level of interaction between the militaries and the civilian local populations, they also need to be concerned about the disease issues within their broader environment.

However, the participants stressed that it is not always appropriate or beneficial for the military to be broadly involved in addressing civil public health matters. The participants discussed how a security framework might be used to determine how or when the military engages on these civilian issues. A good fundamental principle to remember, as one participant suggested, is that not every dimension to the disease problem translates to a security threat or concern. The military should focus on matters which have this security dimension (whether at a cause or an effect level). Knowing what is and what is not a security threat, however, requires expertise. If the disease expertise is not available internally, it should be secured externally because a situation where the military not knowing what it does not know will greatly impact how it will engage and the degree to which it is beneficial or even harmful. Further, what the military does should be dependent on the environment in which it is operating. Therefore, once an understanding is developed on what is and what is not a security threat and what the context is, the military will be more ready to consider which assets can be brought to bear to address the problem, and this will lead to a better allocation and implementation/use of those assets in specific circumstances. A one-size-fits-all approach to military engagement on disease is not beneficial, so this contextual and expert-based analysis is crucial.

The participants further emphasized that military engagement and the form it takes should also be dependent on how the military, with its specific capabilities, adds value to broader multi-player responses to civil public health problems. Although it is true, as noted previously, that the military should be concerned with understanding what public health issues impact the local population with which it interacts, one expert cautioned against the military assuming a lead role in addressing these broader public health matters. Public health activities have largely been a role of civil governments. It is much more likely that the military will assume a supporting role to the civil government when the matter involves civilian populations. Civil government should make the critical decisions about where and how to engage on the matter; as such, if the U.S. Government is involved, the U.S. Department of State should play a lead role. So, as another participant echoed, though a

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21 This idea was suggested as part of a broader discussion on military assets to address disease issues. One expert suggested that in a military environment, the assets that the military has to address these issues may not immediately come to mind.
“whole of government approach”\textsuperscript{22} is needed, some discussions need to take place on the specific areas in which the U.S. military adds value to larger civilian-focused response initiatives.

To this end, the participants discussed how the U.S. military might provide a supporting role in addressing civil public health matters. One expert suggested that the military might provide security, infrastructure, communication, and logistics support to other partners. Another expert further illuminated the possible military role in providing logistics support to these efforts, emphasizing that while the military is adept at doing this at a global or theater level, it is not most adept at “going the extra mile,” which is crucial in Africa. Therefore, some additional partners will be needed at the local community level to operationalize programs. Though some suggested that NGOs could serve as partners to accelerate action at a local level, others highlighted fundamental challenges involving NGO and military partnerships or alliances, including, but not limited to, perception-based ones.

One expert stated that the military, given its high level of experience in civil-military relations (particularly in the reserve components), could also be involved in teaching and educating African governments and their militaries how to deal with these civil public health problems. Another expert took this idea one step further and suggested that these kind of activities should start with selected governments (and their militaries) that have transitioned to democracy. The program could be civilian-based, diplomacy directed, and military implemented. An added benefit is that this kind of partnering initiative may lead to a reverse contagion effect, as neighboring countries might also begin to experience a “change of government culture” if joint or regional activities are employed. Though this would be a slow and long process, it could have long-term effectiveness in instilling better civil-military practices in Africa.

\textbf{Roles for AFRICOM}

There was general agreement that AFRICOM could likely (in some ways continue to) contribute to U.S. engagement on disease and security challenges in Africa. Several experts stressed the importance of AFRICOM evaluating how it might support this engagement over the long-term. Along this line, one participant suggested that the Command might consider establishing a semi-permanent study group on disease and security challenges to improve and ensure its understanding of these challenges and leverage that understanding to consider what role it might play in addressing them in concert with other U.S. partners.

Within the context of the broader discussion on U.S. security-based engagement on disease in Africa, the participants offered several possible roles for AFRICOM, some of which have already been noted. It should be noted that this discussion proceeded at a notional level and a larger discussion of its mission and priorities, as well as what AFRICOM can and cannot do with its funding, did not ensue. However, the participants remarked that further insight into these matters would be beneficial in helping disease and security experts suggest alternative options for it to pursue.

\textsuperscript{22} This “whole of government” approach was heavily discussed in the session. The participants highlighted some fundamental challenges involving interagency processes and attitudes which may inhibit these approaches from becoming not only realized, but also effective.
- Build on the U.S. Navy’s Naval Medical Research Units concept, infrastructure and experience and conduct disease surveillance and monitoring activities in Africa.
- Work with African militaries to develop capabilities in disease surveillance and monitoring.
- Assist with logistics in conducting disease intervention programs at a local level.
- Implement civil-military education programming for African governments and their militaries to inform them of best practices involving partnering to address disease and security problems involving local civilian populations.
- Work through the Overseas Humanitarian, Disaster, and Civic Aid (OHDACA) program to provide funding to support the development of infrastructure, etc. This effort may start with a few test countries such as Ethiopia, Uganda, South Africa, Ghana, Benin, Senegal, Mali (possibly), Botswana, Mozambique, and Liberia.
- Partner with the World Health Organization (WHO) to assist in data collection efforts, developing infrastructure, etc. The WHO might also consider providing expertise to AFRICOM to inform its planning of health-related programs in an “advisory” capacity. The National Defense University, including the Africa Center for Strategic Studies, could be used to explore and/or develop this partnership.
APPENDIX A:  
FREDERICK BURKLE, “ACUTE INFECTIOUS DISEASES IN AFRICA: IMPACT ON HUMAN SECURITY”

Note: The views expressed in this paper are those of the author and not necessarily those of the U.S. Department of Defense.

The Problem

Acute infectious diseases remain a major cause of illness and death in Africa and account for nearly half of all mortality.\(^{23}\) Resulting from a variety of bacterial, viral, fungal, and parasitic causes, many of these diseases historically existed in regions of the now developed world, before public health, cultural, economic, governance, and other societal advances were realized. At various times in history, all countries that claim status as a developed nation go through incremental advances in good governance, education, and public health to control threats from infectious diseases (i.e., malaria in colonial New England, bubonic plague and small pox in Europe, and recently Severe Acute Respiratory Syndrome (SARS) in Toronto). These advances allowed governments to develop and maintain basic health security despite the continual threat of existing and emerging microbes.

During the 1960s and 70s, Africa appeared to be moving toward a state of development where eradicating acute and preventable diseases was possible. The post-Cold War decades were severely cruel to Africa; whatever fragile progress was made disappeared quickly under internal and prolonged warring during the latter half of the 20\(^{th}\) Century. It was not unusual to find health facilities and medical research centers for children throughout the Continent in the 1960s, none of which exist today. Indeed, more Africans were directly killed by war and conflict within their own borders than from all the world wars of the last century. In the last three decades of internal war, health resources were characteristically the first to be destroyed and the last to be recovered. Arguably, direct deaths resulting from battle were relatively few compared to the indirect mortality from the destruction of basic public health protections and lack of treatment for preventable diseases such as malaria, malnutrition, and diarrheal disease which accounts for almost 90% of the total.\(^{24}\)

Of all the worldwide post-Cold War conflicts, Africa has suffered the highest toll. The Health Profile of developing countries in Africa which were at war is:

- Severe malnutrition
- Outbreaks of communicable diseases
- High crude mortality rates (CMR)
- High case fatality rates (CFR)


No public health infrastructure

In the post-conflict situation, this profile may remain or get worse and last for over a decade. The indirect deaths (secondary to lack of public health protections) numbered 71% of the total deaths during the cumulative warring that took place in Central African countries from 1998-2005. After the “shooting had stopped” this rate increased to 83% and did not fall to 45% for several years. Therefore, it is easily understood why 75% of the world’s epidemics are associated with war and conflict, most arising from Africa. Cholera and dysentery epidemics followed the debacle in Rwanda and the eastern Democratic Republic of the Congo, as well as the outbreak of Marburg hemorrhagic fever during the prolonged war in Angola, and leprosy in epidemic proportions in Sudan.

In many ways, acute infectious diseases, even before the onset of the Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) pandemic, were influential in defining the state of public health and exposing its vulnerabilities to the world. With the identification of new and mutant-strain infectious diseases increasing over the past several decades, worldwide public health protections must be updated and modernized to meet the challenges posed by these threats. Africa has experienced the reemergence of previously controlled diseases (from new antimicrobial and insecticide resistance or the collapse of a protective public health system), and the appearance of previously unrecognized infections (in populations living or working in areas undergoing ecologic changes or in forested areas inhabited by disease carrying animals).

Climate change has most significantly impacted the prevalence and distribution of vector-borne diseases, making all humans and livestock vulnerable. With unprecedented migration and worldwide travel, all regions of the globe are equally threatened. What happens in Africa does not stay in Africa. Modern demands for travel and rapid communication actually assist this threat every time a new microbe is introduced to a more receptive host in another region of the world.

To survive, bacteria develop antimicrobial resistance and viruses incessantly mutate to maintain capacity to transmit themselves to vulnerable human and animal hosts. The 1918 influenza pandemic illustrated this ability within the H1N1 family of viruses. Only one amino acid mutation led to the ability of the H5N1 to transmit itself from human to human. Yet, one of the most fascinating examples of its capacity to survive comes from the bacteria *Yersinia Pseudotuberculosis* which centuries ago was only a benign food and water-borne pathogen that received little attention. To survive, the bacteria evolved over time through unimaginable alteration of key genes to fuel the selection of more virulent strains, established both intra-and extra-cellular protective mechanisms, and developed a dependent ‘relationship’ with a blood sucking flea to produce an elaborate capacity to transmit high density bacteremia to humans and other mammals. In doing so the bacteria ensured its ultimate survival. No longer benign, it is now known as *Yersinia Pestis* the bacteria that causes bubonic, pneumonic, and septic plague. Once thought to be isolated to poverty prone countries, plague outbreaks which surfaced in the 1960s in southern California and Arizona

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are now reported annually in every state west of the Mississippi (10-15 cases/year). Through timely surveillance and good public health protections, this disease and others are kept in check in North America.

Africa does not enjoy these protections. Aitsi-Selmi reminds us that despite important recent initiatives such as Millennium Development Goals (MDG) and debt cancellation to improve the health of the most disadvantaged in the world, “poverty and preventable diseases still plague many parts of the globe. Sub-Saharan Africa remains one of the most severely affected” and, remains the only region in the world where life expectancy has not seen much improvement. Whereas the MDG can report there is a 27% drop in under age 5 deaths globally, the 2009 mid-way report card reveals that progress in Africa “has proved insufficient” to reach those targets.

Evidence supports the theories that HIV began in rural Africa when man encroached on areas which were once the exclusive ‘endemic’ purview of monkeys, and drug-resistant tuberculosis arose from inadequate treatment practices in the post-Cold War Soviet Union. This disruption of once uninhabited areas has contributed to HIV and tuberculosis becoming ever present problems shared by every nation of the world. Acute infectious diseases have plagued Africa from the beginning of time. In many respects little has changed, and in some regards the situation has further deteriorated. However, the African experience with acute infectious diseases is generally not a conscious worry to other nations.

This paper will address existing emergent and re-emergent acute infectious diseases, absent HIV/AIDS and drug resistant tuberculosis, which currently and consistently impact human security and defy development for many African nations. Without due diligence, which emphasizes the crucial requirement for better surveillance as a first step in maintaining human security, these diseases have the potential to enhance their global propagation. In concert with the teachings of Price-Smith, nation-state capacity to investigate and control acute infectious disease outbreaks may be the most sensitive ‘composite’ indicator of governance, health, security, and development of the continent.

Acute Infectious Diseases in Africa: A Sample

Africa accounts for 42% of the estimated 10.6 million annual deaths of children under 5 years of age. Global mortality rates have declined from 146 per 1,000 in 1970 to 79 per 1,000 in 2003. Unfortunately, Africa shows the smallest reduction in mortality rates and the most marked “slowing down trend.” Africa’s under-age 5 mortality is 7 times higher than that in Europe. In the 1990s the decline in these rates stagnated and in 14 countries the rates went down and then rebounded. Most of these countries are in Africa. Whereas factors of HIV

and acquired immune deficiency disease from malnutrition contribute to this increase, studies emphasize the underlying weakness of the capacity of health systems to managed acute infectious diseases as a major contributor.

**Pneumonias**

Globally, pneumonia is responsible for about 19% of all deaths in children less than 5 years of age. Seventy percent of these deaths occur in Sub-Saharan Africa. The main culprits are *Streptococcus pneumonia*, *Haemophilus influenza*, and the *respiratory syncytial virus* all of which rarely lead to mortality in the developed world. The leading risk factors contributing to pneumonia are poverty, lack of exclusive breast feeding, undernutrition (i.e., micronutrient deficiencies) or malnutrition, indoor air pollution, low birth weight, crowding and lack of measles immunization.

**Influenza**

In resource-poor Sub-Saharan Africa, accurate surveillance for influenza is difficult, making the region ill-prepared to detect new influenza strains or clusters of human cases that could herald an epidemic. National surveillance systems must be implemented to assess influenza seasonality and disease burden, identify circulating strains, and detect clusters of human cases that could signal the start of a pandemic. G8 plans include developing national level pandemic influenza and polio eradication and global preparations to assist weak nations. Severe gaps exist, but developing and implementing early warning systems in urban and rural settings is a necessary step in that process.

**Measles**

Less than a decade ago, measles, pneumonia, and encephalitis were a leading killer of children in Africa, especially those suffering from malnutrition and immunosuppression. A major public health success for Africa is the significant 91% decline in measles deaths, a strategy that includes vaccination of all children before their first birthday through mass vaccination campaigns that speaks to the power of strong indigenous and external partnerships. Population-based measles serology is used to establish measure of the performance and surveillance of vaccination programs. Still, the disease remains a major

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killer in some high birth rate countries of the Sahel where breakthrough epidemics are expected to occur.36

**Diarrheal Disease**

Diarrheal disease continues to be an important cause of both morbidity and mortality in Africa, despite the advances in health technology, improved management, and increased use of oral rehydration therapy. Under-reporting and miscoding of deaths is common in Africa. Only three countries report reliable vital registration coverage (Mauritius, South Africa, and Zimbabwe).37

The accepted risk factors for diarrheal disease include little or no access to safe water (approximately 50% or 300 million people have no access to safe water), sanitation (60% or 400 million lack access to hygiene sanitation), poor hygiene and feces disposal practices, poor housing, crowding, and poverty which inextricably limits access to health care. It is expected that by 2010 populations without safe water will rise to 400 million and 500 million will lack hygiene sanitation.38 Only Africa showed a decline in the proportion of the population that had access to sanitation between 1990 and 2000.39

**Salmonella**

Until recently, the global burden of salmonella was unknown. The resource poor regions of Africa have the highest incidence (>2,000/100,000 cases/year).40 Drug-resistance is a large and growing problem in infections that account for most of Africa’s disease burden. These include respiratory and diarrheal diseases – especially typhoid fever, cholera, dysentery, and other diarrheal diseases. This is of great concern on many levels as antimicrobial agents are especially life-saving for malnourished and other immuno-compromised patients. An added security concern is that resistant species have already spread worldwide.41

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Mosquito-borne Diseases

Mosquito-borne diseases are flourishing in Africa. This paper will focus on the major mosquito-borne diseases of malaria, dengue, yellow fever and Rift Valley fever.

Malaria

Malaria kills more than 1 million children annually, chiefly in Sub-Saharan Africa. *Plasmodium falciparum*, the most common and malignant of the four human malaria parasites, is spread across all of Sub-Saharan Africa and accounts for 90% of the global *P. falciparum* burden of disease. Death remains comparatively rare largely due to the almost universally acquired functional immunity of early and repeated exposure. Those who die have poorly developed immunity or are young. Whereas infection is rare, the risk of death is likely to be directly related to the risk of infection not necessarily acquired functional immunity. Chronic, subclinical infections result in anemia and undernutrition.

During pregnancy, malaria risks reducing birth weight, infant survival rates, behavioral disturbances and cognitive development. Of the imported cases to developed countries, 70% arise from Africa and most are in children. With climate change, dwellings above 1,500 meters height that were once protected from malaria are witnessing both child and adult infections in populations not protected by the acquired functional immunity afforded populations at the foot of the mountains.

Any organization working in Africa will be familiar with the current controversy concerning the use of indoor residual spraying of insecticide DDT to combat malaria. The World Health Organization (WHO) has recently reversed its environmental stand against DDT, promoting instead other interventions (i.e., chloroquine, bed nets). There are two primary problems with this recommendation - the cost and efficacy of the intervention. Chloroquine is expensive and parasite resistance is high in Africa. The reduction in use of DDT may actually end up resulting in an increase in morbidity and mortality rather than the intended decrease.

Dengue

Dengue has expanded its range over the past several decades, following its principal vector, *Aedes aegypti*, back into regions from which it was eliminated in the mid-20th century, causing widespread epidemics of hemorrhagic fever. Despite surveillance in Africa (albeit poor), epidemic dengue fever caused by all 4 serotypes has increased dramatically since 1980, mostly in East Africa. The most important reason for its spread is uncontrolled urbanization and population growth and density. Economists have used dengue rates as a sensitive indicator of urban decay – highlighting the relationship between a worsening economy and adequate waste management and trash removal. Poor trash removal leads to

more receptacles (i.e., tin cans, Styrofoam cups) in which stagnant water provides for increased vector breeding.\textsuperscript{45}

There is no treatment for dengue and the development of a vaccine is estimated to be between 5 to 10 years away.\textsuperscript{46} Surveillance remains the only means to alert the public to take action and diagnose and properly treat the cases. In Africa where public health infrastructure has deteriorated with limited financial and human resources and competing priorities (i.e., HIV/TB), only emergency control methods exist rather than programs to prevent transmission.

\textbf{Yellow Fever}

Yellow fever is only found in Africa and South America. Africa contributes more than 90\% of the world’s morbidity and mortality due to the disease. It can be prevented by vaccination. Overall mortality, morbidity, and severity are felt to be underreported in Africa.\textsuperscript{47} Between 1939 and 1952, yellow fever virtually disappeared in parts of Africa but a 1978-79 epidemic in Gambia and one in 1995-1996 in Senegal required mass vaccination campaigns. In the last two decades it has re-emerged with “vehemence to constitute a major public health problem in Africa.”\textsuperscript{48} Recent epidemics have predominately affected children under the age of 15 years. In Gambia, successive outbreaks and public health control measures have disrupted health care delivery services, overstretched scarce internal resources, fatigued donor assistance, and resulted in gross wastage of vaccines.\textsuperscript{49}

\textbf{Rift Valley Fever}

A viral zoonosis that is usually limited to animals, rift valley fever (RVF) has the capacity to infect humans. It is usually asymptomatic (mild influenza type illness) but has the potential to cause severe disease in both animals and humans with high rates of morbidity and mortality.\textsuperscript{50} During the recent Kenyan outbreak in 2006-2007, most human cases were among young adult male herdsman.\textsuperscript{51} Important for human security is the potential of RVF to result in significant economic losses due to livestock death (90\% of lambs, but only 10\% of sheep) and abortion (rate is about 100\%).\textsuperscript{52}

In Africa outbreaks are closely associated with periods of above-average rainfall. The emergence of large populations of virus infected \textit{Aedes spp.} insects and RVF serves as a proxy

\textsuperscript{46} Centers for Disease Control and Prevention, \textit{Dengue Fever Fact Sheet}, CDC Division of Vector-borne Infectious Diseases. Available at: \url{http://www.cdc.gov/ncidod/dvbid/dengue/}. Accessed May 18, 2009.
\textsuperscript{49} Ibid.
\textsuperscript{50} WHO Media Centre, \textit{Rift Valley Fever}. Available at: \url{http://www.who.int/mediacentre/factsheets/fs207/en/}.
\textsuperscript{52} Ibid.
for many insect mosquito-borne diseases which have altered their ecological and disease patterns. The instantaneous occurrence of El Nino warm events and warming of the equatorial western Indian Ocean are associated with elevated and widespread rainfall over East Africa. Sustained, heavy rainfall in the East is associated with growth and green-up in vegetation, creating ideal ecological conditions for the emergence of virus-infected mosquitoes. Mapping technologies found that 64% of RVF cases were reported in areas mapped to be at risk within the RVF potential epizootic area.53 The recent outbreak in Kenya was associated with heavy rainfall and massive flooding.54 Whereas the forecasting technology may have enabled earlier interventions, it was not used. However, the implementation of the Integrated Disease Surveillance and Response System did aid local detection.

**Plague**

Plague data for Sub-Saharan Africa for 1970-2007 was ecologically modeled to explore “potential” geographic distribution. The results suggest that the geographical distribution of the plague is wide and diverse across wide ranges of landscapes in Africa, despite the assumption that it is generally highly focal in nature.55 The study supports the potential for the implementation of international modeling and other technologies as tools to predict outbreaks and their behaviors.

**Meningitis**

Sub-Saharan Africa is the only region with a perennial meningococcal meningitis problem stretching from east to west (the “meningitis belt”). Meningitis occurs periodically, but it is difficult to predict waves of activity. The last major epidemic from 1996 to 1997 affected over 200,000 people in 10 countries. The WHO strategies to combat the disease include enhanced surveillance, appropriate case management and reactive mass vaccination with Polysaccharide vaccines.56

**Emerging Diseases**

Nearly forty previously unknown diseases have been identified in Africa since 1973. Some of these include Ebola hemorrhagic fever, Lujo – a new Ebola-like virus that is highly lethal, monkey pox, West Nile fever, hepatitis C, Hendra and Nipah viruses. No cures are currently available for these diseases. With the absence of active surveillance, accurate data on the incidence and prevalence of these diseases is not available.

Neglected Tropical Diseases

The WHO has identified certain tropical diseases, referred to as neglected diseases, as those that “persist under conditions of poverty and are concentrated almost exclusively in impoverished populations in the developing world.” Over 1 billion people internationally are victims of neglected diseases. These victims lack a strong political voice and suffer a low profile and status in public health priorities. These diseases are critical in that they serve as proxy indicators and markers for physical and social disruption and decay. They include guinea-worm disease, endemic trypanosomiasis, leishmaniasis, leprosy, lymphatic filariasis, schistosomiasis, trachoma, and the varied soil-transmitted helminthiases, to name but a few. They should not exist in a civilized world that provides even minimal public health protections.

These diseases are very sensitive to improvements in quality of life and will begin to decline if progress is made across disciplines of economics, society, law, education, and governance alone, even without the implementation of specific health interventions. Without appropriate clinical interventions, the microbes will continue to propagate and worsen if societal and public health improvements are not addressed. Most importantly, many can be eliminated entirely with improved means to access and availability to cost-effective basic public health protections such as safe water, sanitation, shelter and simple but effective risk education.

In summary, those factors that are necessary for the investigation and control of acute infectious diseases in all countries include:

- Infectious disease expertise;
- National infectious disease programs;
- Education & training;
- Secure supply of resources;
- Surveillance;
- Emergency preparedness programs; and
- Coordination at all management levels.

Vaccines for the Prevention of Acute Infectious Diseases

Despite the fact that traditional vaccines are among the most cost-effective interventions for infectious disease, many governments fail in ensuring sustainability in vaccine programs and funding. In Africa, vaccine infrastructure has been suboptimal, especially for routine vaccinations. Immunization “campaigns versus routine services appear to be dominating given logistical and operational hurdles” in Sub-Saharan Africa. New vaccines have been slow to be adopted into the Expanded Program on Immunization (EPI) primarily because of the lack of support for routine delivery throughout the continent. Chronic logistical and

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operational factors are lacking that require continuous investments in human capital, equipment and financing.\textsuperscript{59}

Polysaccharide vaccine use is as unpredictable as the meningitis outbreaks. Countries often lack the means to fund stockpiles, resulting in the late implementation of vaccine control once an outbreak occurs. The International Coordinating Group for Vaccine Provision (ICG) established in 1997 and made up of representatives from the United Nations Children's Fund (UNICEF), Doctors without Borders (MSF), and the International Federation of the Red Cross (IFRC) set up an emergency stock of meningitis polysaccharide vaccine with funds raised by international appeals. To access this stockpile, a country facing an epidemic must submit a request for vaccine to the ICG. The ICG members make a consensual decision based on pre-set epidemiological and operational criteria for outbreak response.\textsuperscript{60}

**Dimensions of Acute Infectious Disease on Human Security**

State capacity is defined by its ability to bring together resources to fight an infectious disease crisis.\textsuperscript{61} Many countries, most notably Africa, knowingly rely on external WHO Emergency response teams to be deployed during an outbreak. This expectation has increased since the implementation of the International Health Regulations (IHR) treaty.\textsuperscript{62}

The facilitation of the spread of infectious disease is directly related to:

- Dramatic increase in drug-resistant microbes;
- Lag in the development of new antibiotics;
- Rise in population numbers and density of populations in megacities;
- Increasing gaps between the ‘have and have not’ in urban settings; and
- The growing ease and frequency of cross border movements.

All of the above will complicate human and global security over the next several decades.\textsuperscript{63}

Cultures that have survived over the centuries are the ones that have provided their communities with the means to facilitate change, thus allowing their culture to thrive over others less fortunate. Africa’s plight seems to result from missed opportunities to facilitate this change and to obtain the very protections that allow one to survive acute infectious diseases. Modern day roadblocks to control of these diseases and development in Africa are:

- population pressures and enduring hunger;

\textsuperscript{59} Ibid.
the absence of peace and security;
the lack of infrastructure and technological development; and
the dearth of genuine political and economic leadership.

Common ground among long recognized G8 positions is that acute infectious disease slows economic growth, perpetuates poverty, and threatens security. Both the production and the consumption levels of economies are affected when infectious outbreaks occur.\textsuperscript{64} Foreign investors are less willing to make even short term investments. Taking the example of HIV, South Africa which generates about 40\% of the Sub-Saharan Africa’s economic output is suggested to drop 20\% or more by 2010.\textsuperscript{65} Unchecked acute infectious diseases will have a negative impact on the workforce for natural resource mining and oil drilling, as well as for agricultural workers in rural areas. Further problems occur with the loss of livelihoods associated with becoming an epidemic-related refugee. Lastly, nations are increasingly reluctant to contribute peace keeping and enforcement troops to areas with increasing infectious disease risk.

The 2006 G8 pledged to write off multilateral debts in 18 of the world’s poorest countries, double aid to Africa, and increase investment in health. The focus was that health and human security are at the top of the global agenda.\textsuperscript{66} Public health protections in the form of potable water, sanitation, adequate nutrition and micronutrients such as vitamin A, C, B6 and zinc, shelter, health and fuel to boil water and cook foods as well as heating and cooling in weather extremes are but a few of the essential services that have allowed the human species to remain healthy and ward off biological and environmental threats to thrive and develop. In every society any one of the situations listed would eventually lead to a pattern of decline in essential public health protections and an increase in the risk for the emergence of infectious disease.

Disproportionately, Africa is the origin of most systemic febrile illnesses among travelers returning home. Experts have no doubt that the emergence of many menacing microbes come from breeding grounds of Africa’s tropical climate. Extreme weather, heavy rains, floods, and droughts, all common to Africa, create conditions conducive to breeding of mosquitoes and outbreaks of acute infectious disease. Deforestation has led to recent Ebola outbreaks, and the man-made loss of rain forests and wildlife that would normally protect against disease carrying rodents and mosquitoes removes a natural buffer against many acute infectious diseases such as malaria, dengue, yellow fever, and plague.\textsuperscript{67}


\textsuperscript{67} Ramin BM, McMichael AJ Climate change and health in Sub-Saharan Africa: a case based perspective. *Ecohealth.* 2009 May 6 (Epub ahead of print).
Yellow fever control is symptomatic of many of the organizational and political ills of African governance. The resurgence of yellow fever and the failure to control the disease has resulted from a combination of several factors:  

- collapse of health care delivery systems;
- lack of appreciation of the full impact of yellow fever disease on the social and economic development of the affected communities;
- insufficient political commitment to yellow fever control by governments of endemic countries;
- poor or inadequate surveillance;
- inappropriate disease control measures; and
- preventable poverty coupled with misplaced priorities in resource allocation.

The future must include adequate budgetary allocations and political will through the WHO, UNICEF, the Global Alliance for Vaccines and Immunization (GAVI) and others for support and technical leadership.

**Economic**

Cross-country regression analyses of malaria risk and gross domestic product have shown the disease to be a significant influence on long-term economic growth. War predictably lowers the GDP by 2.5% each year of conflict. Malaria accounts for a staggering 1-2 percentage point drop in the gross domestic product (GDP) in Africa with a cost to Kenya of GDP of 2 to 6% and with Nigeria 1 to 5%. As much as half the gross domestic product is lost in highly endemic areas. Economists argue that the mechanisms of national economic losses are a composite of economic burdens at the household level.

In Africa, malaria is primarily a disease of the poorest of the rural poor. Strategies to prevent infection, such as insecticide-treated bed nets, are not reaching the poor. A Kenyan study found that less than 7% of poor children sleep under bed nets compared to 35% of those in the wealthiest of households. Similar findings have been reported in other African nations. Much of what is known is based on estimations and extrapolations. Africa requires further research and empirical investigation or modeling to better understand the spatial determinants of risk and the impact of infection on health outcomes and how risks change from birth through adulthood depending on multiple dependent variables.

There is sufficient evidence that effective interventions for the prevention of diarrheal disease (exclusive breastfeeding, complementary feeding, safe water, good sanitation and hygiene, zinc and vitamin A supplementation, oral rehydration therapies, and antibiotics for dysentery) could prevent many deaths due to diarrhea. Most are feasible in Africa, however

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the problem remains the lack of economic and political capacity to deliver these interventions.\textsuperscript{71}

Economics has frequently been sited as a barrier to the use of vaccinations. Through the Vaccine Fund, the funding arm of the Global Alliance for Vaccines and Immunization (GAVI) financial resources are provided to countries to fund the operational costs of immunization campaigns. GAVI provides funding to national governments based on national income.\textsuperscript{72} The demonstration of Africa’s disease burden as well as its associated economic burden must precede the allocation of financial resources for prevention through vaccination.

Economic failures further impact biodiversity conservation and contribute to emerging infectious diseases from lack of capacity and poor resources availability hindering effective early disease surveillance, control and warning systems both nationally and locally. Low prioritization of acute infectious disease occurs routinely in face of exclusive attention to HIV and tuberculosis. Of great concern is the lack of governmental transparency in sharing emergent infectious disease data in order to safeguard national economic interests over those of global public health. Fledgling governments normally fail to address long term disease threats from a ‘cost of prevention’ vs. ‘costs of inaction’ standpoint.\textsuperscript{73}

\textbf{Climate Change}

Climate change has resulted in tropical diseases and their vectors moving to newly warmer climates, both north and at higher altitudes. Forecasting technologies are useful to improving disease control especially in diseases such as RVF. The response of vegetation to increased levels of rainfall can be easily measured and monitored by Remote Sensing Satellite Imagery (RSSI).\textsuperscript{74} These forecasting technologies support the early detection requirements looked for in the International Health Regulations (IHR) treaty. Ramin and McDonald suggest that individuals will face multiple stresses from climate change in the future, both from the direct effects of the environmental change as well as other non-climate stressors such as infectious diseases.\textsuperscript{75} Multiple sources of vulnerability must be considered when designing climate change and socioeconomic development interventions.

\textbf{Urbanization}

The most dominant pattern of internal migration is rural to urban often depriving villages of the ablest young people.\textsuperscript{76} About 67\% of Africans now inhabit urban or suburban

\begin{thebibliography}{9}
\bibitem{72} Miller MA, JT Sentz, \textit{Vaccine-Preventable Diseases}, In Jamison DT, RG Feacham, MW Makgoba, et al (Eds.) \textit{Disease and Mortality in Sub-Saharan Africa} (2nd Edition), The World Bank., Washington, DC.
\bibitem{76} UNESCO, \textit{Population, Migration and Urbanization, Bull Unesco Reg Off Asia Pac.}, June 1982; (23):239-313.
\end{thebibliography}
conclaves. In other situations, rural African women, often single or widowed with 2-5 children, flee to urban settings expecting social services and employment only to be subject to new abuses and insecurity, frequently leaving no other option than prostitution to survive. Whereas 6% of the urban populations in developed countries are poor squatters, developing country cities, which may increase in population by 1 million every 6 months, have over 78% squatters.

**Informing Human Security Decision-Making**

To optimize human security, many disciplines of culture, law, governance, politics, health, economics, and anthropology must be considered. For example, Africa has suffered an uneven governance record. Rules of governance, Deng suggests, has a powerful impact on the quality of reform. The adoption of European-inspired models of governance at the time of independence accounted for much of the region’s poor track record of managing ethnic diversity. He recommends that future constitutional reform be based on “African values” and recognition of cultural diversity which he believes will best protect individual and minority rights. If not, and especially where many weapons still float freely, war and conflict will continue or return.

Collier affirms in his book, *The Bottom Billion: Why the Poorest Countries are Failing and What Can Be Done About It*, that 47% of post-conflict countries will return to war within a decade. This figure rises to 60% in Africa. Incitements that lead to a return to fighting are often a stagnated economy and a worsening infant mortality rate; but any country in which the post-conflict health threshold remains above the crisis level of > 2.0 deaths/10,000 per day because of inadequate public health capacity is doomed to fight again. Sixty-seven percent of Africans now live in urban settings where density of populations, not numbers, matters most in increasing the risk of acute infectious disease transmission.

To add insult to injury, the financial crisis has weakened African economic growth and food production. These result from a mixture of rising food prices, increasing difficulty securing international loans, deteriorating export revenues, and shrinking labor markets causing a brain drain, societal unrest, and conflict. Societal unrest increases when people are hungry or unemployed and anti-government activity will ensue. No African data is available but China – a country with similar mega-city problems – already admits to over 20 million unemployed and is reporting increasing ‘mass incidents’ and criminality.

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Under funded public health facilities and failing user-pay initiatives brought about by the collapsed economic globalization will be unable to handle the increased burden of disease risking increased vulnerability and exacerbation of all infectious diseases. The worst case scenario suggests that Africa will face a massive refugee and migration crisis within Africa with populations fleeing to the Mediterranean region and possibly more distant locations.  

**Surveillance is Step One**

Developing an effective and sustainable surveillance and emergency preparedness system with sustainable disease control and prevention programs is the most important strategy for dealing with acute infectious diseases, as well as the influence of variables such as climate change-induced emerging infectious diseases. Defining the burden of infectious diseases in Africa may require extending surveillance beyond health facilities especially in rural areas, or making extrapolations based on health utilization data. At the district level, African countries have intensified in-service training on Integrated Diseases Surveillance and Response (ISDR). Impact studies show that trained district personnel are a “key factor in the performance of ISDR through the reporting and analysis of data (detection, report, analysis, investigation, response and feedback) at the lower level.” All parameters of “timeliness, completeness in reporting and analysis” showed marked improvement. Furthermore, it is important to ensure that existing surveillance activities such as the WHO Global Salm-Surv can enable national public health, veterinary, and food security institutes by adding laboratory-based surveillance and outbreak detection and response for an increasingly broader group of animal and food related diseases.

Academic centers in Africa are the “main, if not only” site of scientific knowledge production. Countries rely on these universities for producing basic research and solving domestic problems, many focused on health and basic laboratory work on common diseases. Ninety percent of research in Africa, mostly performed by individual scientists, is funded by foreign assistance, yet over the last 30 years, the research capacity at many institutions has gradually eroded. In fact, “one could claim that science in many African countries has, in the recent past, been systematically deinstitutionalized.” Africa has lost 11% of its share in global science since its peak in 1987; Sub-Saharan science has lost almost a third. This has and will continue to have negative effects on science and health in Africa. Worse, many of the scientific institutions in these countries “are fragile and susceptible to the vagaries of political and military events.”

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Recommendations are that governments and international donors should be encouraged to shift their support from individual scientists to supporting research and laboratory centers and institutes that either already provide or have the potential to provide local level management of critical areas of national interest that is visible to the populace such as information and communication technologies (possibly for critical surveillance projects), outbreak investigation and control, and the education and training of the health care workforce.

Bonnemaison voices concern that the precarious nature of security in Africa today makes one wonder whether or not security and defense policies in Africa, especially Sub-Saharan Africa, remain appropriate. This is based on the premise that the very concept of security in Africa is cause for fear. There is need to promote the return of an enabling political environment by restoring government accountability, legitimacy, and turning security into a public good while there is still a chance. States where public services were functioning satisfactorily until increasing deterioration and collapse heightened social tensions caused ethnic divisions and social disorder. Now more than ever Africa needs foreign aid for stability and democracy projects. A more likely focus of gaining credibility would be that the governments move to palpably improve the quality of life awareness through highly visible projects in basic health, especially in acute infectious disease mitigation, education, and job creation.

Two articles provide the reader with a comprehensive listing of potential directions any organization must consider as priorities in mitigating current acute infectious disease outbreaks and in developing a coordinated strategic and policy level approach to incrementally addressing this chronic problem in the future. Recommendations are listed in Tables 1-3.86

Conventional pathogen security schemes, whether infections are intentional or accidental, have mixed reviews when it comes to protection. Researchers suggest that foreign policy on pathogen security should first emphasize bio-surveillance and infectious disease early warning systems, rapid and effective treatment, and strengthened response mechanisms.87 Certainly, there are links between the health of a population and economic development, ability to provide health and other basic services as a measure of governance legitimacy, and that widespread disease limits the health and security pool of future capable leaders.88 This can be defined as health security.

Since what we are now asking of many African countries is beyond the capacity of any single actor, The U.S Africa Command (AFRICOM) must be seen as a ‘force-multiplier.’\textsuperscript{89} WHO is always limited by funding and technical resources but has the expertise and the will. By being a steadfast WHO advocate AFRICOM becomes a more effective partner. State-building is a fragile process; but whatever strategies are proposed for acute infectious disease control the focus for success always comes back to first correcting basic deficiencies in sanitary conditions, clean water, public health protections, and developing an indigenous research-to-policy base that promotes good governance, health, and equity. Capacity to control and eradicate endemic acute infectious diseases serves as a proxy indicator for chronic, smoldering deficiencies in basic public health protections and governance while exposing gaps in public health surveillance, infrastructure and systems, and human security.

\textsuperscript{89} Ibid.
Table 1: Modified from: Emerging Infectious Diseases from the Global to the Local Perspective: A Summary of a Workshop of the Forum on Emerging Infections. Jonathan R. Davis & Joshua Lederberg, editors. Board of Global Health, Institute of Medicine, National Academy Press, Washington, DC, 2001

To achieve an integrated system of surveillance and monitoring with an appropriate and timely response, the world community must work toward the following common goals:

- Strengthening disease surveillance of humans and domestic animals. Priority areas include improving communication and information sharing between the medical and veterinary communities and designing integrated medical and veterinary disease surveillance systems at the regional level.
- Building on existing disease-specific reporting systems. Consider the use of novel technology, such as remotely sensed data, in existing disease surveillance systems and expand disease-specific surveillance systems to monitor other closely related diseases.
- Enhancing and improving the use of communication and information technologies.
- Promoting the International Health Regulations.
- Developing improved, low-cost laboratory infrastructure for surveillance.
- Fostering good public health practices.
- Training personnel.
- Educating the public and professionals to slow the rate of increase of antimicrobial resistance.
- Conducting collaborative research. Priority areas for investigation include preventing the development of drug-resistant microbes by promoting the appropriate use of antibiotics; understanding the transmission patterns of food-, water-, vector-, and air-borne pathogens; and improving diagnostic tests and prevention and control strategies for infectious diseases.
- Accelerating vaccine development and distribution.
- Fostering credible coordinating international groups.
- Encouraging overseas institutions, such as military medical research units, to be more involved in helping the hot country develop and infectious disease surveillance infrastructure.

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<tr>
<th>The following are needed at the policy level:</th>
<th>The following are needed at the research level:</th>
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<tbody>
<tr>
<td>➢ Political will</td>
<td>➢ The research agenda for severe emerging diseases must be driven by public health needs</td>
</tr>
<tr>
<td>➢ A well-defined surveillance system</td>
<td>➢ Diversity of research in biomedical field, availability of drugs for treatment and implementation of new warning systems for surveillance and action</td>
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<td>➢ Training of human resources for health research</td>
<td>➢ Data sharing between researchers is necessary, as is communication on health issues</td>
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<td>➢ Training on how to manage and detect cases at baseline by health workers</td>
<td>➢ Early detection of cases at all levels is critical</td>
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<td>➢ More funds from local budgets for research</td>
<td>➢ International collaboration between research institutions, countries and regions</td>
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<tr>
<td>➢ Institutions must fund good research</td>
<td>➢ Surveillance for diseases such as malaria, acute respiratory disease and diarrhea</td>
</tr>
<tr>
<td>➢ Catalysis of collaboration by research donors</td>
<td>➢ Apply scientific advances to early detection of infections</td>
</tr>
<tr>
<td>➢ Dissemination of new knowledge</td>
<td>➢ Extend research to microbiological, ecological, and environment factors which can affect health status</td>
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<td>➢ Facilitation of research uptake</td>
<td>➢ Extend research to factors involved in disease emergency such as climate</td>
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<td></td>
<td>➢ Sustain local drug development and availability of generics for diseases such as HIV</td>
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<td></td>
<td>➢ There needs to be training in basic knowledge, such as how to store and deliver vaccines</td>
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<td></td>
<td>➢ Disease control must take into account socio-economic factors, such as education and the population's living standards</td>
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<td>➢ Research questions should be raised by developing countries rather than by foreign institutions – as is the case nowadays</td>
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<td></td>
<td>➢ There must be capacity building through the creation of more research centers in African countries and a network for exchange and transfer between those structures and international ones</td>
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<td></td>
<td>➢ We must work to facilitate and coordinate the development of a research agenda</td>
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<td></td>
<td>➢ Support is needed to move from research through policy to implementation</td>
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<td></td>
<td>➢ Funding for scaling up of on-going interventions must be sustained</td>
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Table 3: Lessons Learned from Initiatives on the ground: Modified from Pandemics & Infectious Diseases 17 Nov 2008. Available at: http://www.tropika.net/svc/specials/bamako2008/session-reports/pandemics-and-infectious-diseases.

<table>
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<tr>
<th>Lessons learned for initiatives on the ground:</th>
<th>Findings and conclusions:</th>
</tr>
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<tbody>
<tr>
<td>➢ Initiatives must have global public health relevance</td>
<td>➢ The world must respond collectively to epidemics and other public health problems through adequate public health measures</td>
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<tr>
<td>➢ There must be a broad application of research efforts and findings</td>
<td>➢ Community participation and economic/legislative support are both essential to address health issues</td>
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<tr>
<td>➢ There must be capacity-building in under-resourced countries</td>
<td>➢ Capacity building is a long-term process</td>
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<tr>
<td>➢ Academies of science will help in the development of basic sciences</td>
<td>➢ The current level of data collection and sharing is inadequate. By increasing sharing, it will encourage research and collaboration between researchers all around the world</td>
</tr>
<tr>
<td>➢ Build capacity in epidemic detection, diagnosis and responses at all levels</td>
<td>➢ There is a lack of effective surveillance for early detection of cases and appropriate diagnosis</td>
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<tr>
<td>➢ Establish an emergency fund to deal with epidemics</td>
<td>➢ There needs to be effective communications, as this is essential for research</td>
</tr>
<tr>
<td>➢ More research is needed on new tools, methodologies, new drugs and vaccines</td>
<td>➢ Research must move from theory to action/implementation</td>
</tr>
<tr>
<td>➢ Political will and a high level of education are critical. These two factors are largely responsible for Cuba’s achievement in eliminating many infectious diseases. This example illustrates why we need to implement a clinical research network in order to inform and share funding for different research programs around the world</td>
<td>➢ There must be adequate funding to scale up an intervention</td>
</tr>
<tr>
<td>➢ Epidemiological surveillance and blood certification should be part of prevention and control</td>
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APPENDIX B:

Note: The views expressed in this paper are those of the author and not necessarily those of the U.S. Department of Defense.

The Problem

Health is a critical driver of the prosperity and socio-political stability of a given nation, augmenting the functionality of the apparatus of governance, its ability to project power abroad, and ultimately the security of the state. Republican security theory, which emphasizes the centrality of the well-being of the people, bridges the static divide between human security and national security. Epidemic disease, then, is a direct threat to the body politic and to the apparatus of the state, as it erodes prosperity, destabilizes the relations between state and society, renders institutions sclerotic, generates intra-state (and perhaps inter-state) violence, and ultimately diminishes the power and cohesion of affected nations. As such, epidemic infectious diseases such as HIV/AIDS and tuberculosis (hereafter referred to as HIV and TB) can be profoundly disruptive to an affected polity, undermining its capacity for effective governance and its ‘security.’ While this paper examines the ramification of these diseases – I argue that as the aggregate burden of disease upon society increases, it will increase the probability of internal turbulence (perhaps even state failure). The profoundly destabilizing effects of contagion result from various factors; high levels of mortality and/or morbidity, the destruction of human capital, economic disruption, negative psychological effects (fear, deprivation), the consequent acrimony between affected social factions, and the deteriorating relations between the populace and an often draconian state.

Arguments

First, epidemic disease acts as a stressor that compromises the prosperity, structural cohesion, legitimacy, and thus the security of sovereign states.

Second, disease exacerbates domestic conflicts between ethnicities, and/or classes, generates intra-societal and intra-state violence, and the resulting societal discord may generate punitive and draconian responses by the state against its own populace as it seeks to maintain order. Thus, disease functions to destabilize the coherence, power, and (perhaps) the security of the state.

Third, epidemics may promote economic and political discord between nations, and may generate significant levels of armed conflict between sovereign states.

This analysis is based upon the body of republican security theory developed in Andrew Price-Smith, Contagion and Chaos, MIT Press, 2009; and Andrew Price-Smith, The Health of Nations, MIT Press, 2002. Also see Daniel Deudney, Bounding Power: Republican Security Theory from the Polis to the Global Village, (Princeton University Press, 2007).
Fourth, although certain pathogens (HIV, pandemic influenza) appear to generate greater instability than others, the aggregate burden of disease may be a substantive threat to national security.

Fifth, warfare (both intra and inter-state) induces ‘war pestilences,’ contributing to the proliferation of infectious disease within the ranks of the combatants, and subsequently to proximate civilian populations. Thus, conflict serves as a disease amplifier.

Sixth, the paradigm of ‘health security’ is philosophically grounded in the political tradition of republican theory, which holds that the well-being of the body politic (i.e. the population) is central to the effective governance and power of a given state.

**Demography of HIV and TB**

Why focus on HIV and TB in this analysis? First, all nations exhibit considerable variance in their causes of death profiles, particularly between adult and under-5 mortality. Those top ten causes of mortality (all ages) in the Republic of South Africa – as a percentage of all deaths per annum are: HIV/AIDS (52%), Cerebrovascular Disease (5%), Ischaemic Heart Disease (4%), Lower Respiratory Infection (LRI) (4%), Violence (3%), Tuberculosis (2%), Diarrheal disease (2%), Traffic Accidents (2%), Diabetes (2%), Chronic Obstructive Pulmonary (1%).

The mortality profile for Tanzania looks marginally different, however HIV/AIDS remains the principal cause of mortality. Causes of death in Tanzania (all ages) per annum, as percentage of total deaths are as follows: HIV/AIDS (29%), LRI (12%), Malaria (10%), Diarrheal (6%), Perinatal (4%), TB (3%), Cerebrovascular (3%), Ischaemic Heart (3%), Syphilis (2%), Traffic Accidents (2%). Nigeria’s profile is again dominated by infectious diseases, and HIV/AIDS remains the principal cause of mortality: HIV/AIDS (16%), LRI (11%), Malaria (11%), Diarrheal (7%), Measles (6%), Perinatal (5%), TB (4%), Cerebrovascular (4%), Ischaemic Heart (3%), Pertussis (2%). Finally, the data from Zimbabwe illustrate a similar pattern of dominance by infectious disease, with HIV/AIDS remaining the dominant cause of death: HIV/AIDS (67%), LRI (4%), TB (3%), Perinatal (2%), Cerebrovascular (2%), Diarrheal (2%), Ischaemic Heart (2%), Malnutrition (1%), War, (1%), Measles (1%).

Although there are pockets of stabilization of HIV incidence (e.g. North Africa, and the Horn region), the larger story is one of a pandemic with its epicenter in Sub-Saharan Africa. The Joint United Nations Program on HIV/AIDS (UNAIDS) argues that the epidemic has slowed its expansion (in terms of prevalence as a

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91 LRI are also known as ‘pneumonia.’
92 World Health Organization, South Africa Mortality Profile, 2009 [http://afro.who.int/home/countries/fact_sheets/southafrica.pdf](http://afro.who.int/home/countries/fact_sheets/southafrica.pdf)
93 WHO, Tanzania factsheet, [http://afro.who.int/home/countries/fact_sheets/tanzania.pdf](http://afro.who.int/home/countries/fact_sheets/tanzania.pdf)
95 WHO, Zimbabwe factsheet [http://afro.who.int/home/countries/fact_sheets/zimbabwe.pdf](http://afro.who.int/home/countries/fact_sheets/zimbabwe.pdf)
percentage of population). However, this is a function of both aggregate population growth, and perhaps more importantly, the fact that mortality from HIV/AIDS is now equal to or exceeding the rate of new infections.

In Sub-Saharan Africa, the HIV pandemic resulted in 1.9 million new infections in 2008, and over 22 million people in the region are now HIV positive, with 75% of all HIV-related global mortality occurring on the African continent. The intensity of the epidemic varies greatly across the region with prevalence rates as low as circa <.5% in North Africa, to circa 2-3% in Central and West Africa, and exceeding 15% in much of Eastern and Southern Africa (e.g. Zimbabwe 15.3%, Zambia 15.2%, South Africa 18.1%, and Botswana 23.9%). The greatest number of people living with HIV/AIDS (5.7 million) is in the Republic of South Africa, whereas Swaziland currently boasts the highest adult prevalence rate (26%). Women are disproportionately affected throughout the region, particularly among younger age cohorts. Further, anti-retroviral therapies are still not reaching many in the developing world who are infected.

Tuberculosis is also rampant throughout Sub-Saharan Africa, with causality primarily determined by several (often-intersecting) trends, poverty, inter-state and intra-state conflict, and the HIV/AIDS pandemic. Globally, of the 20 nations with the greatest incidence of TB, 9 of them are in Sub-Saharan Africa. Empirically, it is difficult to separate the HIV and TB epidemics in the region, as co-infectivity by the two pathogens is common. HIV destroys the body's immune system, permitting colonization of the host by the TB bacillus. World Health Organization (WHO) data indicates that HIV+ incident TB cases are greatest in South Africa (73%) and Zimbabwe (69%), declining to a low in the Democratic Republic of the Congo (5.9%) where conflict appears to be the principal driver of the disease. Again, in these 9 countries, prevalence peaks in Zimbabwe (714 cases per 100000), South Africa (692), and the Democratic Republic of Congo (666), with a low in Kenya (319). Mortality rates from TB (per annum/per 100000) peaked in Zimbabwe (265), followed by South Africa (230), Mozambique (127), with a low in Kenya (65). Mortality is highly associated with the presence of HIV/AIDS in the population. Control of both HIV and TB is adversely affected by a lack of adequate financial, human and material resources, low state capacity, and lack of political will. Recording and reporting systems are often unable to provide reliable data on availability of anti-retroviral therapies, (and for TB) on DOTS implementation, collaborative TB/HIV activities or multi drug resistant TB (MDR-TB) management.

Infectious disease such as HIV and TB constitute both a direct and indirect substantive threat to the stable governance and national security of seriously affected polities. Given the complex mix of factors working to destabilize affected nations, the HIV and TB epidemics should be regarded as powerful ‘stressors’ that undermine the prosperity and political stability of a given polity. I argue that in the context of poor governance (i.e. low levels of political will and state capacity), HIV and TB reinforce a vicious spiral within affected societies to threaten the stability of the state.

This study employs process-tracing techniques to illustrate the effects of HIV/AIDS upon the various domains of economics, governance and security. Within such complex biopolitical systems we see “connectivity” across domains, and effects may take the form of complex feedback loops and exhibit non-linear properties.

**Complex Chains of Causality**

Myriad factors have driven the proliferation of HIV and TB throughout the region, including conflict and peacekeeping (troops serving as vectors), migration (including displaced persons), widespread poverty, lack of state capacity, cultural sexual norms (promiscuity and coercion), and the lack of women’s rights. Feedback loops among these variables make pedestrian claims of parsimonious and direct causality next to useless. For example, such non-linear dynamics are frequently observed during periods of war, which often acts as a mechanism that facilitates disease emergence and proliferation. To the extent that war destroys medical, public health and sanitary infrastructure, impedes the production and distribution of food and medical supplies, prevents surveillance and treatment, and generates poverty, it is a driver of pathogenic emergence and virulence. To that end, the social and structural chaos induced by war may act as a powerful disease amplifier. As the mortality profiles for different polities indicate, the burden of disease is often contextual. For example, malaria generates significant mortality in tropical regions but does not generate similar mortality in temperate regions (e.g. malaria is not prevalent in the Republic of South Africa).
Health and State Capacity

States with relatively low levels of capacity, but governed well, can respond with reasonable efficacy to the epidemics and control their further spread. This has occurred in Thailand, which saw political elites use their power to mobilize civil society in a bid to reduce risky behavior. However, countries with middling to low levels of capacity, combined with poor governance, have typically been ineffective at containing the spread of the contagion, and in mitigating its adverse economic and political effects (e.g. Zimbabwe).

This variance in state capacity (SC), and in the quality of governance, helps to explain differential outcomes in the ability of governments to respond to the epidemic and to maintain economic and political stability. For example, Botswana has much better political leadership and higher empirical levels of SC than Zimbabwe, despite having a slightly higher HIV seroprevalence rate. This combination of effective political leadership and higher endogenous capacity (primarily due to rents derived from mineral exports) has moderated the negative effects of the pandemic in Botswana, whereas Zimbabwe is seeing significant socio-economic destabilization as a result of HIV/AIDS. Empirically there is a strong positive reciprocal association between population health and state capacity, with the former driving the latter to a marginally greater degree. Thus, significant declines in population health will induce significant declines in downstream state capacity.

Health and National Security

Led by the Clinton Administration, United Nations Security Council Resolution 1308 (2000) declared the HIV/AIDS pandemic a threat to global security. Any agent (e.g. a pathogen, or combinations thereof) that directly threatens to destroy a significant proportion of a state’s population base constitutes a significant threat to that country’s national security. Given that HIV/AIDS is projected to kill >30 percent of the population in Sub-Saharan Africa over the 2005-2015 time frame, it is reasonable to conclude that the epidemic constitutes both a direct and an indirect threat to the national security of many nations throughout that region, particularly when analyzed through the lens of republican security theory.

Mechanisms

- The HIV pandemic has dramatically reduced life expectancy and quality of life, and created significant cohorts of orphans who are extremely vulnerable to radicalization.
- The destruction of a country’s stock of human capital results in the systematic erosion of the economy through declining productivity, depletion of savings, and a soaring debt load.

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106 HIV seroprevalence in Thailand has declined markedly to 1.4%, and Uganda to 6.7%, see UNAIDS 2006a.
107 SC can be empirically measured according to the index of measures developed in Price-Smith, Health of Nations, MIT 2002, p. 25-29.
108 On this empirical feedback loop between health and state capacity, see Andrew Price-Smith, The Health of Nations, MIT Press, 2002.
Disease systematically erodes institutions of governance (such as the viability of police and military forces) while depleting aggregate state capacity, thus dramatically narrowing the range of policy options available to policymakers.

The above factors may combine to exacerbate conflict between elites, classes, and ethnicities, or foster violence by an increasingly draconian state against its own populace in order to maintain control.

**Orphans**

The pandemic has generated significant cohorts of orphans who have lost one or both parents to AIDS, particularly in Sub-Saharan Africa. UNAIDS estimates the number of children who have lost one or both parents to AIDS at 25 million by the end of 2010 with estimates of circa 17 million AIDS orphans on the African continent by that date. In 2000 the U.S. National Intelligence Council report concluded:

> With as much as a third of the children under fifteen in hardest-hit countries expected to comprise a ‘lost orphaned’ generation by 2010 with little hope of educational or employment opportunities, these countries will be at risk of further economic decay, increased crime, and political instability as such young people become radicalized or are exploited by various political groups for their own ends; the pervasive child soldier phenomenon may be one example.

Such a large cohort of orphans threatens to overwhelm already flimsy support systems. The majority of these children will grow up impoverished, poorly educated, prone to criminal behavior (primarily in order to survive), and disenchanted with society. Such disaffected young individuals are excellent candidates for recruitment to radical political causes. As the AIDS epidemic continues to expand, it will destabilize governments throughout the region. Such weakened states may provide fertile breeding grounds for terrorist organizations to move in, set up shop, and recruit from the disaffected, particularly from such enormous orphan populations. This is worrisome given that terrorist organizations (including Al-Qaeda affiliates) are increasingly active in eastern and northern Africa. Thus, the AIDS orphan problem threatens not only to create governance problems within affected states, but also to contribute to problems of global governance (particularly terrorist activity) in the future.

**Economics**

In this section I document the negative effects of HIV/AIDS on domestic economies at the micro and macroeconomic levels, on foreign investment, and on the impact of foreign aid to affected polities.

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Micro Level Impacts

At the household level, disease has a negative effect on production and earnings, resulting in reduced income, declining productivity, and the reallocation of labor and land to deal with debilitated and/or dead breadwinners. AIDS-induced debilitation generates a number of negative demand and supply-side shocks to households, including the loss of income from infected breadwinners, significant expenditures for medical expenses, and the loss of employment as healthy individuals must care for ill family members. Premature AIDS-induced mortality results in the permanent loss of income, large funeral costs, and permanent labor substitution as children are removed from school to generate income for the family. Furthermore, widows may lose their land when their husbands die of AIDS, as male relatives may lay claim to the dead individual’s belongings (including their spouses) according to custom. Given that many women in the region lack legal certificates (such as wills or marriage certificates) their rights are not protected.

The burden of disease falls unequally upon classes, with poorer populations bearing a disproportionate share of the costs relative to their incomes.111 The indigent may be forced into sexually exploitive situations in order to generate income to make ends meet. The poor will also be most vulnerable to infection given their lower levels of nutrition and lower basal health conditions, and they will be unable to afford certain medical treatments (i.e. anti-retroviral therapies) that may slow the progression of the disease. Therefore, it is important to understand that the burden of AIDS tends to fall upon the lower and middle classes, which fosters and perpetuates greater income disparities. The consequences of such increasing economic inequities on societal stability are explored below.

HIV/AIDS has various effects on the labor supply, through the debilitation and death of skilled employees, which induces a scarcity of skilled workers, and a decline in returns to training. Thus, at the macro level HIV is eroding the endogenous stock of human capital in affected regions. Counter-intuitively, AIDS-induced debilitation and mortality will not dramatically lower unemployment rates because as the macro economy contracts this will lower the demand for labor, even as the labor supply diminishes due to disease-induced morbidity and mortality. Moreover, there are often pre-existing shortages of skilled labor in the region, and as the epidemic erodes human capital it will only serve to increase the shortage of skilled workers. Thus the long-term prognosis consists of persistently high unemployment combined with a dearth of skilled labor.

Human Capital

Economic development should be regarded as a “generalized process of capital accumulation” wherein capital consists of both physical and human capital and institutions.112 The epidemic’s pernicious influence on the formation and consolidation of human capital within African society is significant. AIDS will take the lives of a significant

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African Security Challenges: Now and Over the Horizon

proportion of the brightest minds in Sub-Saharan Africa. This in turn hampers sustainable economic development and impedes the consolidation of stable democratic government. It is important to recognize that the HIV/AIDS epidemic simultaneously drains reserves of human capital, and prevents its accumulation, combining to weaken the institutional capital of a given society.

The net outcome of HIV-induced decline in a society’s stock of human capital is the stagnation of economic development and the onset of serious economic decline over time. The diversion of funds from education into the health care sector will impede the development of human capital in affected societies as youth cohorts fail to acquire skills and adequate literacy. McPherson argues that this is like ‘running Adam Smith in reverse.’ “As an increasing number of workers become debilitated and drop out of the labor force, many of the advantages of specialization and the division of labor are lost. Moreover, the loss of labor is a direct reduction of the nation’s productive capacity.”113 This long-term process of AIDS-induced human capital erosion will result in significant long-term negative outcomes for regional prosperity.

**Macroeconomic Impact**

Given that AIDS depletes reservoirs of human capital and impedes its formation, it will limit the long-term development potential of Sub-Saharan Africa. AIDS-induced shortages of skilled workers will result in higher domestic production costs, which will in turn erode international competitiveness. As the rate of population growth declines and the economy contracts, so will personal incomes, corporate profits and consumption all decline. Government revenues are also projected to decline as the tax base stagnates. Simultaneously, the government will attempt to increase expenditure in the health sector, which will result in a deteriorating national fiscal balance. This may result in increased deficit spending in the wake of a contracting endogenous revenue base.

In sum, the HIV/AIDS promises diminishing national and individual savings, declining productivity, and falling rates of foreign investment. The overall picture is one of sustained economic stagnation in the region, with dramatic declines in certain nations (e.g. Zimbabwe). This slowing of national economic growth, decline in savings, chronically high levels of unemployment, and declining real per capita GDP will intensify the poverty experienced by the middle and lower classes.

As the burden of disease restricts prosperity, or induces the contraction of the national economy, it will intensify competition between economic and political elites for control over scarce fiscal resources. This may contribute to substantial governance problems, including increasing the potential for political violence, coups d’etat, and perhaps to state failure. Given that the HIV/AIDS epidemic has the potential to generate significant long-term constraints on the economies of affected nations, it will also limit their military power for the foreseeable future. It is impossible to field a modern, well trained, and well-equipped fighting force without a substantial national economic engine to power it. Let us now turn our discussion to the impact of the HIV/AIDS pandemic upon the broader apparatus of governance, including military and police forces.

Governance

Polities throughout Sub-Saharan Africa, already exhibiting a substantive potential for violence and institutional instability, will continue to exhibit volatility as a result of the severe burden of disease. The nature of socio-political instability experienced in the region today will result in an increasingly demoralized populace. This, coupled with rising levels of mortality and morbidity resulting from infectious disease, magnifies the sense of hopelessness and despair within the citizenry and diminishes perceptions of governmental legitimacy. This will create rising individual and collective frustration that will be expressed through increasing acts of lawlessness, personal behavioral recklessness, and callousness towards fellow citizens. Under these circumstances, one should anticipate growing crime levels, including more aggressive crimes of violence like murder, rape and other sexual assaults.

Over the next decade many nations in Sub-Saharan Africa will also lose a substantial portion of their existing law enforcement personnel, and see budgets shift funding away from law enforcement towards health care. Premature displacement of personnel will cut critically into law enforcement’s capacity to sustain peace and tranquility at the community level. The future of effective governance, through law enforcement efforts, is increasingly at risk in the region. Partially, this will result from growing attrition rates among police personnel. A decline in law enforcement’s credibility as a primary source of intervention and assistance to victims of crime also explains the growing lack of confidence in this governance unit.

Effect of HIV on Public Service

The AIDS epidemic affects a given nation’s ability to sustain and deliver quality public services for its citizens, and therefore compromises citizens’ perceptions of governmental legitimacy. The HIV/AIDS epidemic also creates a profoundly negative impact on the delivery and quality of services provided to the citizenry. Traditionally, in developing nations, the best and brightest have chosen careers first in public service. Civil service employees often represent the most highly educated in underdeveloped societies, with many having received graduate education from European and American universities. Moreover, these professionals, because of their higher incomes and revered status in society, have been earlier victims of HIV than has the general populace.114 HIV/AIDS will cut deeply into professional civil service talent pools in all areas of government. Costly losses in professional fields like civil engineering, medicine and health care, education, financial administration, and developmental planning remain a particular concern.

Governments in the region are witnessing the erosion of their endogenous state capacity. A polity’s level of SC also determines the scale of adaptive resources that the nation could mobilize to mitigate the negative effects of HIV/AIDS. In this instance, the many states in the region have clearly failed the task, particularly Zimbabwe, South Africa, Zambia, and Swaziland. Affected polities face a vicious spiral in the form of a positive feedback loop.

114 Note that in the early years of the epidemic many highly successful African males contracted HIV due to the social norm that wealthy males were expected to have many female sexual partners. In latter years the epidemic’s demographic distribution has seen the infection of African society en masse.
the AIDS epidemic progressively takes its toll, SC declines, and as SC declines the government’s ability to institute creative AIDS intervention strategies correspondingly diminishes.

Further, as disease erodes state capacity, it undermines the state’s ability to provide much needed services to the population (e.g. health care, education, law enforcement) that in turn accelerates the proliferation of disease in a negative spiral. Therefore, purely endogenous solutions to build capacity and curb the spread of the epidemic are unlikely to be successful, and capacity will have to be imported from exogenous sources (such as foreign aid). Thus, the desire for purely ‘African solutions’ to the HIV epidemic, while understandable, have been of limited utility as they fail to acknowledge the epidemics inexorable and negative effect on endogenous state capacity.115 Furthermore, given that many societies in Sub-Saharan Africa now reel under the strain of HIV/AIDS the cumulative effect will be to erode the capacity of the region as a whole, wherein affected states will find it increasingly difficult to come to each other’s aid.

In a climate of increasing lawlessness, a stagnant or contracting economy, increasing institutional fragility, and declining revenue in the form of taxes, the capacity of the state will be, at a minimum, strained. This results from increasing demand upon the state from all sectors to deal effectively with the epidemic, even as the epidemic inexorably erodes the state’s capacity to respond effectively. Simultaneously, as the population becomes increasingly infected, morbidity and mortality will grow, poverty will deepen as people deplete their savings, and crime will increase. All of this will result in increased feelings of relative deprivation and injustice on the part of the people, who will also increasingly see the government as illegitimate. It is precisely this dynamic of a weakening state combined with increasing real and/or perceived deprivation that increases the probability of political violence against the state, or between powerful elite factions struggling to control the state.116 The probability of intra-state political violence (and possible state failure) logically increases as the epidemic intensifies.

**Effect on Democratic Transition**

History has shown that outbreaks of epidemic disease often result in the curtailing of civil liberties.117 Thus, the burden of disease may stifle the emergence of democracy or induce a shift from democratic to more authoritarian modes of government, particularly in unstable nascent democracies. Indeed, in such a climate of disease-induced disorder, scarce resources, and declining government legitimacy, the predatory state may increasingly resort to the use of violence against competing factions within its own population in an attempt to maintain

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115 Such ‘African’ solutions have also seen the provision of treatment (e.g. anti-retrovirals), but have typically ignored ‘prevention’ because the latter involves a substantive change in behavioral norms. Thus, we see exceptionally high prevalence rates, wherein the infected live longer, and continue to transmit the disease to the uninfected portion of the populace.


order (e.g. Zimbabwe). The lessons of history are also useful here, as epidemic disease has generated conflict between rival ethnicities over the centuries, typically with the scapegoating of minority populations.

Increasing disease-induced deprivation combines with a weakening state to generate an increasing probability of violence within the society, either between ethnic groups, classes, or political elites. It may also foster the deliberate use of violence by the state against its own citizens in an attempt by the government to retain control. This phenomenon is widely observed throughout Sub-Saharan Africa. As the state becomes increasingly unable to supply the demands of the populace, it is seen as increasingly illegitimate. As the epidemic intensifies one would expect an intensification of authoritarian rule, and the slowing of democratization in the region.

National Security

The ‘securitization’ of HIV/AIDS has become an issue of significant debate between the paradigms of ‘national security’ and ‘human security.’ Orthodox conceptualizations of national security are overly militaristic and myopic, ignoring a plethora of issues (such as environmental change, disease, and migration) that threaten states in the modern era. Conversely, while human security arguments may be intuitively appealing, they present significant conceptual and analytical hurdles.

In relative terms, the absolute mortality that AIDS has induced within the population of Sub-Saharan Africa vastly exceeds deaths resulting from any armed conflict in the recorded history of that continent, and it is increasingly common to hear Africans refer to the epidemic as a ‘holocaust.’ Thus, HIV/AIDS has a direct negative effect on regional security through its generation of massive mortality throughout the African population.

Our examination of HIV/AIDS’ effect on governance continues with an assessment of the epidemic on military and paramilitary (i.e., law enforcement) forces. In many nations these organizations serve as control mechanisms to ensure and sustain the peace within society.

The nascent health security literature views AIDS-induced destabilization as a contributing factor to intra-state conflict. Elbe and Ostergard have argued (correctly) that AIDS-induced mortality and morbidity jeopardize the efficacy of military institutions, but there is little empirical evidence that disease generates conflict between states. However, Ostergard has

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122 See Elbe, 2002; Ostergard, 2002.
recently argued that his recent data and analysis supports his thesis that increasing levels of HIV foster inter-state warfare. The jury remains out on this issue.

HIV erodes the functional efficacy of affected military institutions along four dimensions.

- HIV/TB generates the need for additional resources for the recruitment and training of soldiers to replace those who have fallen ill, have died, or are expected to die. Resources are also required to provide health care for soldiers who are sick or dying.
- The spread of HIV/TB is affecting important staffing decisions. High HIV prevalence rates lead to (1) a decrease in the available conscription pool from which to draw new recruits, (2) deaths among officers higher up the chain of command, and (3) a loss of highly specialized and technically trained staff who cannot be easily or quickly replaced.
- HIV/TB results in increased absenteeism and reduced morale.
- HIV/TB is generating new political and legal challenges for civil-military relations.

Historically, military and paramilitary organizations have also served as primary vectors for the spread of sexually transmitted pathogens, including HIV. According to Lindy Heinecken’s estimates, Zimbabwe’s armed forces exhibit an aggregate seroprevalence rate of 55 percent. HIV-related military attrition will create a loss of continuity at the command level and in the ranks as experienced higher-ranking officers are forced into early medical retirement. Rodger Yeager of the Civil-Military Alliance to Combat HIV and AIDS notes that military staff attrition also results in “increased recruitment and training costs for replacements, and a general reduction in preparedness, internal stability, and external security. In this sense, HIV/AIDS can easily serve as a domestic and regional destabilizer.”

Losses of more seasoned and experienced military staff through HIV and AIDS related attrition will induce institutional fragility in the apparatus of coercion.

Deployment of military personnel further compounds the transmission of HIV, as separation from one’s family often results in increased sexual contact with high-risk partners (e.g., commercial sex workers). The fact that other sexually transmitted diseases often go unchecked within this group, especially when involved in active military conflicts, exacerbates the problem.

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123 We await the provision of Ostergard’s analysis, and hope to assess the data, methodology and conclusions. Should his assertion prove correct it would of considerable interest to the U.S. Department of Defense.
125 Price-Smith, Contagion and Chaos, MIT Press, 2009
The AIDS-induced erosion of human capital induces major gaps for sustaining crucial operational aspects of these services. For example, morbidity and mortality losses of technical talent (e.g., airplane mechanics, computer and information specialists, accountants and procurement officers) weaken the service and mission of these organizations. Throughout the region, the progression of AIDS will weaken the military and its capacity to sustain national security. This results from the fact that other proximate states are also confronting the operational difficulties associated with the contagion, such that external military adventures are becoming prohibitively costly for all affected states in the region. This is not to say, however, that the rising levels of disease will equate with pacific relations within the state.

**Violent Conflict (Intra-State)**

In the mid-1990s the U.S. State Failure Task Force conducted several iterations of empirical tests and found that Infant Mortality was one of two variables that exhibited a significant statistical association with state failure. This finding was central to many of the inquiries into health and security that followed. The existing burden of disease has a significant long-term negative effect on the prosperity and quality of life of the majority of the people in the region, generating elevated, and/or increasing levels of relative deprivation throughout the populace. Relative deprivation will increase for the lower and lower middle classes that bear a relatively greater cost of AIDS-induced morbidity and mortality. People will experience absolute deprivation as the economy stagnates and begins to contract as a result of the AIDS epidemic and other diseases. Increasing deprivation generates increasing frustration and aggression by both individuals and collectivities, and such increasing deprivation thereby increases the probability of social violence and political chaos.\(^\text{128}\) Collective violence against the state tends to occur when *stressors* (such as pathogens) create both the *incentive* and the *opportunity* for citizens to engage in violent collective action against the status quo. Thus, the strength or weakness of the state apparatus itself plays a key role as to whether men decide to rebel against their political masters. When increasing deprivation is combined with declining state capacity these factors act together to increase the probability of collective violence against the state.

The epidemic will generate increased competition between interest groups for increasingly scarce economic resources, particularly as federal funding is diverted to health care, and away from other sectors such as law enforcement, education, and the military. The AIDS epidemic has most certainly placed rapidly increasing demands on governments to provide additional services to their populations, even as the state’s capacity to provide such additional services is simultaneously reduced by the increasing burden of disease. Furthermore, the state may have to significantly increase taxation of the populace to restore depleted government coffers. The resulting reduction of services and increasing taxation in a climate of increasing deprivation will further erode the government’s legitimacy. Thus, epidemics will simultaneously increase absolute and relative deprivation, increase perceptions of government ineptitude and illegitimacy, and erode state capacity. Collectively this equation increases the probability of internal collective political violence against the state, between political elites, or violence by the state against its own population, and increases the probability of state failure. Thus, the burden of disease (including the HIV/AIDS epidemic)

may not only kill and impoverish a significant proportion of the populace; it may also contribute to macro-level political and social destabilization that jeopardizes the stability and security of entire continent.

**Effects on Regional Stability**

Given the massive burden of disease in Sub-Saharan Africa, and increasing levels of HIV and TB, these epidemics threaten to destabilize many countries throughout the entire region including Botswana, South Africa, Zambia, Angola, Malawi, Namibia and Mozambique, Nigeria, Kenya, Tanzania, Swaziland, and Lesotho. As the HIV/AIDS pandemic intensifies it increases the potential for the economic and political destabilization of Southern and Eastern Africa. This bodes ill for the spread and consolidation of democracy and provides fertile ground for the spread and consolidation of radical and/or terrorist operations throughout the region.

One important element typically overlooked in the discussion of infectious disease’s impact on national security is its possible effect on the relative power of states, particularly within a regional context. A given state’s *relative power* (that is - its power relative to other states) the will be affected by its HIV infection rates, as well as its aggregate burden of disease. This means that those states that exhibit a significant burden of disease will suffer reduced power relative to those polities that are healthier.\(^{129}\) Contagion-induced shifts in relative power may generate interstate war, however (as noted above) this dynamic requires further analysis. Finally, epidemics have the long-term potential to affect and alter regional balances of power.

The disease-induced stagnation of effective governance throughout the entire Southern Cone region will require increasingly effective militaries to guarantee the integrity of Africa’s borders. Unfortunately, as detailed above, HIV’s negative effect on the military promises increasing “institutional fragility” for that institution, and a stagnant economy will result in diminishing levels of tax revenue to direct towards military funding. Thus, while the required demand for military power and efficacy is growing, the supply of military power and efficacy is rapidly declining due to the epidemic’s decimation of military personnel. As a result, African states should be increasingly concerned that the epidemic promises increasing insecurity for the region as a result of both internal and external destabilization. The greatest immediate risk is increasing instability throughout the region as a result of crime, smuggling, refugee movements and the collapse of effective governance.

One must understand the effects of HIV and TB from the perspective of an “attrition process,” the slow and inexorable destruction of a nation’s economy, its institutions, and its social mores as well. The pandemics are processes, not temporally constrained events, and should be seen in that light. As deprivation increases to critical mass, and the apparatus of coercion erodes, expect considerable internal political violence.

These findings permit the formulation of a set of axioms regarding the effects of infectious disease in general (and HIV/AIDS and TB in particular) on the dynamics of security and

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\(^{129}\) Realist theory argues that shifts in the relative power often precipitate interstate conflict. See Kenneth Waltz, *Theory of International Politics*, Addison-Wesley.
governance in Sub-Saharan Africa. Further cross-national empirical studies will be required to evaluate the general applicability of these axioms.

Conclusions

1. Demographic collapse will generate vast cohorts of orphans, who may generate crime, and be radicalized. Provision of aid (education, nutrition, healthcare, and housing) should decrease potential for radicalization and augment US legitimacy.
2. Burden of illness falls disproportionately on the poor, exacerbating inequities between classes.
3. Economic contraction generated by the contagion will lead to competition over scarce resources, fostering competition between elites, classes, and possibly ethnicities.
4. Disease, and conditions generated by it, foments scapegoating and possibly the persecution of ethnic minorities.
5. Disease-induced mortality erodes the base of human capital, limiting future economic productivity and generating institutional fragility throughout existing structures of governance.
6. As disease erodes institutional capacity, and generates economic stagnation, it may alter the relative power of affected states vs. non-affected states.
7. The pernicious effects of infectious disease radiate across domains to undermine the cohesion of both state and society, and governments occasionally resort to the draconian use of lethal force against their own populace in order to maintain stability. Thus, disease may impede development and consolidation of democracy in the region.
8. The burden of disease (as a macro level stressor) may destabilize vulnerable states, probably contribute to state failure, and possibly foster inter-state war.
9. The expansion of HIV will continue to make peacekeeping by African regional forces problematic, inviting increased external interventions to stabilize the region.

Recommendations

1. The U.S. Department of Defense (DOD) should continue to fund analysis of the disease/security nexus, with expansion beyond a narrow focus on Africa. In particular, one requires a robust multi-year empirical study of the relationships between (A) disease and state failure, and (B) disease and inter-state war.
2. DOD should engage with other services (USAID in particular) in order to provide assistance to populations burdened by disease, promoting stabilization of those polities.
3. DOD should endorse the activities of the WHO, although the U.S. Africa Command (AFRICOM) will want to prioritize the control of infectious diseases, which generate the greatest mortality/instability in the African context. AFRICOM should not support WHO’s focus on chronic disease, as it is not relevant to >95% of the African population, and plays a marginal role (if any) in socio/political destabilization of that continent.
APPENDIX C:
PATRICK LAMMIE, “PARASITIC DISEASES IN SUB-SAHARAN AFRICA”

Parasitic Diseases in Sub-Saharan Africa

Patrick J. Lammie
Peter J. Hotez

SABIN Vaccine Institute

Talk Outline

- A brief introduction to parasitic diseases and their associated health burden
- The social context in Africa
- Potential solutions and their security implications
Falciparum Malaria

- Vector-borne
- Disease Burden
  - 300-500 million clinical cases per year
    - 80% of cases in Africa
    - Children under five and pregnant women
  - 1 million deaths per year
    - > 90% of deaths in Africa
  - Worsened by and contributes to poverty
  - Consumes 40% of public health expenditures in Africa

The Global Distribution of P. falciparum

From: Hay S et al. 2009
NTDs - Diseases of the Bottom Billion

Onchocerciasis

Lymphatic Filariasis

Intestinal Helminths

Trachoma

Schistosomiasis

Global Overlap: Lymphatic Filariasis, Onchocerciasis, Schistosomiasis, Soil-Transmitted Helminths, Trachoma
The African Context

Ranking of Parasitic and Neglected Tropical Diseases (NTDs) in SSA by Prevalence and Distribution

<table>
<thead>
<tr>
<th>Disease</th>
<th>Est Population infected in SSA</th>
<th>Est % of SSA population infected</th>
<th>Est % global disease burden in SSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falciparum Malaria</td>
<td>305 million</td>
<td>47 %</td>
<td>71%</td>
</tr>
<tr>
<td>Hookworm</td>
<td>198 million</td>
<td>29%1</td>
<td>34%2</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>192 million</td>
<td>25%</td>
<td>93%</td>
</tr>
<tr>
<td>Ascarisis</td>
<td>173 million</td>
<td>25%1</td>
<td>21%2</td>
</tr>
<tr>
<td>Trichuriasis</td>
<td>162 million</td>
<td>24%1</td>
<td>27%2</td>
</tr>
<tr>
<td>Lymphatic Filariasis</td>
<td>40-51 million</td>
<td>6-8%</td>
<td>37-44%3</td>
</tr>
<tr>
<td>Onchoceriasis</td>
<td>37 million</td>
<td>5%</td>
<td>&gt;99%</td>
</tr>
<tr>
<td>Active Trachoma</td>
<td>30 million</td>
<td>3 %</td>
<td>48%</td>
</tr>
<tr>
<td>Loiasis</td>
<td>&lt;13 million</td>
<td>1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Modified from Hotez P, Kamath A 2009


2 Up to 10% of estimated population prevalence and 0.2% of global disease burden (Hotez P, Kamath A 2009) and the 0.3% estimated hospitalization prevalence (Brooker S, Hotez P 2005) for NTDs were excluded from the final estimates.

### Disease burden (DALYs) in SSA resulting from Malaria and the NTDs

<table>
<thead>
<tr>
<th>Disease</th>
<th>Estimated Global Disease Burden in DALYs</th>
<th>Estimated % Disease Burden in SSA</th>
<th>Estimated SSA Disease Burden in DALYs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falciparum Malaria</td>
<td>46.5 million</td>
<td>89%</td>
<td>40.9 million</td>
</tr>
<tr>
<td>Hookworm</td>
<td>1.5 – 22.1 million</td>
<td>34%</td>
<td>0.5 – 7.5 million</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>1.7 – 4.5 million</td>
<td>53%</td>
<td>1.6 – 4.2 million</td>
</tr>
<tr>
<td>Ascariasis</td>
<td>1.8 – 10.5 million</td>
<td>21%</td>
<td>0.4 – 2.2 million</td>
</tr>
<tr>
<td>Lymphatic Filariasis</td>
<td>5.9 million</td>
<td>35%</td>
<td>2.0 million</td>
</tr>
<tr>
<td>Trichuriasis</td>
<td>1.8 – 6.4 million</td>
<td>27%</td>
<td>0.5 – 1.7 million</td>
</tr>
<tr>
<td>Human African Trypanosomiasis</td>
<td>1.5 million</td>
<td>100%</td>
<td>1.5 million</td>
</tr>
<tr>
<td>Trachoma</td>
<td>2.3 million</td>
<td>52%</td>
<td>1.2 million</td>
</tr>
<tr>
<td>Onchocerciasis</td>
<td>0.5 million</td>
<td>69%</td>
<td>0.5 million</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>2.1 million</td>
<td>18%</td>
<td>0.4 million</td>
</tr>
<tr>
<td>Leprosy</td>
<td>0.2 million</td>
<td>14%</td>
<td>0.02 million</td>
</tr>
<tr>
<td>Dengue</td>
<td>0.6 million</td>
<td>&lt;1%</td>
<td>0.005 million</td>
</tr>
<tr>
<td><strong>Total NTDs</strong></td>
<td>≤ 56.6 million</td>
<td>15-37%</td>
<td>8.6 million – 21.2 million</td>
</tr>
</tbody>
</table>

1DALY estimates for the STH infections and schistosomiasis were obtained by adjusting a wide range of available global estimates according to the percentage of the total number of cases that occur in SSA, while for the other NTDs the disease burdens were quoted directly from WHO estimates.


### Ranking by disease burden (DALYs) and comparison of Total NTDs with HIV/AIDS, tuberculosis, and malaria

<table>
<thead>
<tr>
<th>Disease</th>
<th>Disease Burden in SSA (DALYs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>64.0 million</td>
</tr>
<tr>
<td>Malaria</td>
<td>40.9 million</td>
</tr>
<tr>
<td>NTDs</td>
<td>8.6 – 21.2 million</td>
</tr>
<tr>
<td>Malaria + NTDs</td>
<td>49.5– 62.1 million</td>
</tr>
<tr>
<td>Helminth Infections</td>
<td>5.4 – 18.3 million</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>9.3 million</td>
</tr>
</tbody>
</table>

The disability of Malaria and NTDs may be as high as HIV/AIDS

Co-distribution of *P. falciparum* and hookworm in Africa

- Predicted prevalence of hookworm
- Climatic suitability for *P. falciparum* malaria transmission
- Overlap of moderate-high hookworm (prevalence > 20%) and *P. falciparum* transmission

From Brooker, S et al 2006

Malaria and the NTDs
The “Perfect Storm” of Anemia
Increased Susceptibility

Geographic Overlap

Take Home Messages

- Overlapping diseases exacerbate adverse health outcomes.
- Polyparasitism is the rule throughout rural Africa, not the exception.

Cause or Effect?

Parasitic Diseases  Poverty
Poverty in Sub-Saharan Africa

- Percentage of SSA Population living on less than $1.25 per day: 51%
- Total SSA Population living on less than $1.25 per day: 390.6 million
- Percentage of World’s Population living on less than $1.25 per day in SSA: 28%
- Percentage of SSA Population living on less than $2 per day: 73%
- Total SSA Population living on less than $2 per day: 556.7 million
- Percentage of World’s Population living on less than $2 per day in SSA: 22%

From Chen H, Ravallion M, 2008

Malaria and Poverty

GNP per capita (1995)

Malaria
Destabilizing Elements of the NTDs

- The “Poverty Trap”
  - Reducing agricultural productivity
  - Abandonment of agricultural lands
  - Pivotal role in world's food crisis
  - Reduces education and wage earning
  - Promoting ignorance
- Intimate relationship between NTDs and Conflict
  - LF among ethnic minorities in Burma
  - Leishmaniasis in guerilla areas of Colombia
  - Dracunculiasis in Sudan
  - Hookworm/Schistosomiasis/HAT/Onchocerciasis in Sudan, CAR, DRC, Angola

NTDS and Conflict
- A Specific Example

Sleeping sickness, central Africa, 1926-1995
A Testable Hypothesis?

Parasitic Diseases → Poverty

Will interventions targeting parasitic diseases reduce poverty, improve cultural stability and promote security?

NTD Interventions

- Annual treatment reduces morbidity and transmission
- Drugs are safe, effective and donated
  - Ivermectin
  - Albendazole
  - Mebendazole
  - Azithromycin
  - Praziquantel
- Mass treatment is more cost effective than screening
- Drugs can be delivered as an integrated package - to reduce program costs
Mass Drug Administration as an Intervention for NTDs

Range of treatment costs per person per year

- HIV/AIDS
- TB
- Malaria
- "Rapid Impact" Package

Cost per patient treatment per year ($) < $1.00 per person per year

Scaling Up the LF Program - a Global Platform for NTDs

From Ottesen et al., 2008
The African Program for Onchocerciasis Control

- Operating in 19 sub-Saharan countries
- Annual treatment of 90 million people per year
- Community directed treatment promotes local ownership and decision making

Interventions Targeting Malaria

- Insecticide-impregnated bed nets
- Indoor residual spraying with insecticide
- ACT – artemisinin combination therapy
- Intermittent treatment of pregnant women (and infants and school children)
Benefits of Joint Control of Malaria and NTDs

- Reduced anemia and improved child health
- Reduced child mortality
- Improved child development
- Improved school attendance
- Improved worker productivity
- Improved maternal health

USG Opportunities to Intervene

- President’s Malaria Initiative
  - Programs in 15 African countries
  - 24M protected by IRS in 2008
  - Malaria prevalence declined 53% in Zambia
  - Under 5 mortality declined 32% in Rwanda
- President’s NTD Initiative
  - Supporting MDA in 10 countries
  - Cumulative total of 38M treated since 2006
Security Benefits of USG Interventions

- Health diplomacy
- NTD programs
  - Engage community volunteers as distributors
  - Empower community decision making
- NTD and malaria programs:
  - Address community priorities
  - Improve community perceptions of U.S.

Cause or Effect?

Parasitic Diseases

Poverty

?
Is It a Problem to Be Wrong?

- NTD and malaria programs are low cost, high visibility programs that involve communities in activities that deliver measurable public health benefits.