

**The Global Threat of
New and Reemerging
INFECTIONOUS
DISEASES**

**Reconciling U.S. National Security
and Public Health Policy**

Jennifer Brower • Peter Chalk

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This research was conducted by RAND as part of its continuing program of self-sponsored research. RAND acknowledges the support for such research provided by the independent research and development (IR&D) provisions of RAND's contracts for the operation of its Department of Defense federally funded research and development centers.

Library of Congress Cataloging-in-Publication Data

The global threat of new and reemerging infectious diseases : reconciling U.S. national security and public health policy / Jennifer Brower, Peter Chalk.

p. cm.

“MR-1602-RC.”

Includes bibliographical references.

ISBN 0-8330-3293-3

1. Communicable diseases—Social aspects. 2. National security. 3.

Bioterrorism—Health aspects. 4. Emergency medical services—Government policy. 5. Emergency management. I. Brower, Jennifer, 1967– II. Chalk, Peter.

RA643.5 .G564 2003

363.3'2—dc21

2002036756

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Cover design by Stephen Bloodsworth

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Description: astrovirus from stool colorized

Published 2003 by RAND

1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

1200 South Hayes Street, Arlington, VA 22202-5050

201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516

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PREFACE

With the end of the Cold War, there has been a growing realization that the United States and the international community face a number of transnational challenges that do not emanate directly from the policies of individual states. In turn, these challenges cannot be countered solely by the actions of a state, yet they threaten the most basic element of state security, the individual. One important emerging transnational threat in this regard is the spread of infectious disease. This menace has garnered growing attention and resources from the U.S. government since the attacks of September 11, 2001, and the subsequent anthrax attacks.

This report undertakes to examine the changing nature of security and focuses on the threat of infectious disease. It examines two case studies: HIV/AIDS in South Africa as an example of the pervasive and insidious threat disease can pose to a state's stability and security and the threat of infectious disease in the United States to examine the factors in the increasing threat, America's capacity to respond, and policies, institutions, and procedures that can be developed to mitigate the threat.

This report will be of interest to U.S. and international policymakers inside and outside government and at all levels who are developing strategies to cope with the increasing threat posed by pathogens. It should also be of interest to those individuals developing strategies to cope with the emerging security environment.

This study was conducted by RAND Science and Technology as part of RAND's continuing program of self-sponsored research. We acknowledge the support for such research provided by the inde-

pendent research and development provisions of RAND's contracts for the operation of its Department of Defense federally funded research and development centers. These include Project AIR FORCE (sponsored by the U.S. Air Force), the Arroyo Center (sponsored by the U.S. Army), and the National Defense Research Institute (sponsored by the Office of the Secretary of Defense, the Joint Staff, the unified commands, and the defense agencies).

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SUMMARY

Today, the United States and most of the world face little danger from direct military assault from an opposing state. This threat has been supplanted with concerns about “gray area” challenges that face the global community. Emerging security threats such as terrorism, drug trafficking, and environmental degradation differ significantly from traditional statecentric paradigms both in their causes and the policies designed to ameliorate them.

The increasing transnational threat of infectious disease deserves special attention within this context of the evolving definition of security in the post–Cold War era. Statecentric models of security are ineffective at coping with issues, such as the spread of diseases that originate within sovereign borders, but have effects that are felt regionally and globally. Human security reflects the new challenges facing society in the 21st century. In this model, the primary object of security is the individual, not the state. As a result, an individual’s security depends not only on the integrity of the state but also on the quality of that individual’s life.

Infectious disease clearly represents a threat to human security in that it has the potential to affect both the person and his or her ability to pursue life, liberty, and happiness. In addition to threatening the health of an individual, the spread of disease can weaken public confidence in government’s ability to respond, have an adverse economic impact, undermine a state’s social order, catalyze regional instability, and pose a strategic threat through bioterrorism and/or biowarfare.

While infectious diseases are widely discussed, few treatises have addressed the security implications of emerging and reemerging illnesses. This report provides a more comprehensive analysis than has been done to date, encompassing both disease and security. It comes at a critical juncture, as the magnitude and nature of the threat is growing because of the emergence of new illnesses such as Acquired Immune Deficiency Syndrome (AIDS), Ebola, and hepatitis C; the increasing inability of modern medicine to respond to resistant and emerging pathogens; and the growing threat of bioterrorism and biowarfare. In addition, human actions amplify these trends by putting us in ever-greater contact with deadly microbes. Globalization, modern medical practices, urbanization, climatic change, and changing social and behavioral patterns all serve to increase the chance that individuals will come in contact with diseases, which they may not be able to survive.

The AIDS crisis in South Africa provides a disturbing example of how a pathogen can affect security at all levels, from individual to regional and even to global. Approximately one-quarter of the adult population in South Africa is Human Immunodeficiency Virus (HIV) positive, with the disproportionate burden of illness traditionally falling on the most economically and personally productive segment of society. The true impact of the AIDS epidemic is yet to be felt. Deaths from full-blown AIDS are not projected to peak until the period between 2009 and 2012, and the number of HIV infections is still increasing.

The disease is responsible for undermining social and economic stability, weakening military preparedness, contributing to increases in crime and the lack of a capability to respond to it, and weakening regional stability. Specific effects include creating more than two million orphans, removing about US\$22 billion from South Africa's economy, and limiting South Africa's ability to participate in international peacekeeping missions.

Many causes played a role in the development of the crisis, including promiscuous heterosexual sex, the low status of women, prostitution, sexual abuse and violence, a popular attitude that dismisses risk, as well as the failure to acknowledge the magnitude of the problem in the early and middle stages of the epidemic. The South African government has made a relatively small effort to curb the

epidemic, in part due to President Thabo Mbeki's public questioning of the link between HIV and AIDS, and this has had devastating results. This example serves as a lesson to other countries; if unaddressed, infectious disease can negatively and overwhelmingly affect a state's functions and security.

Currently the United States is managing the infectious disease threat; however, there are many indications that, if left unchecked, pathogens could present a serious threat to the smooth functioning of the country. Many of the global factors that serve to increase the threat from pathogenic microbes are particularly relevant for the United States. These include globalization, modern medical practices, urbanization, global climatic change, and changing social and behavioral patterns. Deaths from infectious illnesses average approximately 170,000 per year, but the scope of the situation is much larger when stigmatization, productivity losses, and other psychological and economic costs are taken into account. In addition, the ability of pathogens to mutate and to spread into previously unknown habitats means that the toll could increase significantly. In the second half of the 20th century almost 30 new human diseases were identified, and antibiotic and drug resistance grew at an alarming rate. This trend applies equally to animal diseases. As citizens continue to travel, import food and goods globally, engage in promiscuous sex, use illegal intravenous drugs, encroach on new habitats, and utilize donated blood, their chances of coming in contact with new or more virulent organisms increases. The added threat of bioterrorism intensifies the risk of encountering a life-threatening microbe.

As Americans' exposure to emerging and reemerging pathogens has grown, the country's ability to respond to infectious disease has diminished in many areas. In 1992, the Institute of Medicine recognized this and challenged the nation to respond. Until the terrorist strikes of September 11, 2001, and the subsequent anthrax attacks, the U.S. government at the federal, state, and local levels had largely failed to respond. In 2002, the public health and medical infrastructure across the United States remains variable and in many cases inadequate to deal with naturally occurring or man-made outbreaks of infectious disease. This infrastructure is highly diverse and includes hospitals, clinics, public health laboratories, pharmaceutical companies, veterinarians, universities, and research groups

working to reduce the harmful impacts of microorganisms. Resources and responsibilities for responding to disease outbreaks lie mainly with the state, and the Centers for Disease Control and Prevention (CDC) acts as the lead federal entity. Potential responses to an outbreak include education and information campaigns, vaccination, vector control, food recall, isolation, and quarantine. First an outbreak must be recognized, however, and clinicians and public health laboratories play a critical role in this endeavor. Because of the global nature of the issue, the United States must also act internationally to prevent and respond to disease.

As a result of the low priority given to public health over the past 30 years—in part because of the belief that technological advances would solve the challenges posed by microbes—healthcare workers lack the education and training needed to recognize and treat emerging and reemerging illnesses. Technologies at public health departments and laboratories have not kept pace with other developments; vaccine research, development, and manufacturing has been reduced and concentrated in a few companies; and personnel shortages have been induced in nursing, epidemiology, and other public health and medical areas. In addition, there is a general lack of coordination and communication among the myriad federal, state, and local officials involved in fighting the disease threat and those in the private sector.

Certainly the terrorist attacks have focused attention on the need for a strong public health infrastructure, and policymakers have begun to make funds available to address some of the fundamental shortcomings inherent in the system. However, this investment must be sustained, and there is considerable work to do in enhancing overall policy coordination, management, and development.

The federal government should consider playing a more concerted role in providing resources and instituting unified standards for the common defense against the microbial threat, while giving state and local authorities the flexibility to implement programs in a manner that will best meet local needs. Increased federal investment is critical to endeavors at all levels of government and in the private sector; it could provide the basis from which to develop a functional, coherent national policy for combating infectious disease.

In light of this, there are several specific actions that could be initiated to address the shortcomings identified in this study:

- Coordination between public health authorities at all levels of government needs to be substantially enhanced and developed in conjunction with the development of mechanisms that allow for greater interaction across state borders and local boundaries.
- The private sector must be integrated into overall public health efforts, particularly in relation to the research, development, and manufacture of vaccines and antibiotics and the development of microbial surveillance technology.
- A large-scale education and information campaign should be undertaken, explaining the need for regular vaccination and highlighting the importance of disease prevention through such practices as protected sex, the responsible administration of antibiotics, and “clean” needle exchanges for drug users.
- Efforts should be made to augment the supply of healthcare workers currently available in the country.
- Hospitals and emergency health facilities need to develop appropriate emergency plans to respond to new diseases and large patient influxes, such as those that might occur in the aftermath of a bioterrorist attack or the introduction of a serious infectious illness such as Ebola through airplane travel. Medical receiving facilities should have the means to provide surge capacity in hospital beds and other vital functional areas and have in place auxiliary communication systems and power networks.
- More resources need to be invested in foreign governments to help them increase the effectiveness of their internal disease prevention efforts. Useful initiatives that could be undertaken include
 - mutual aid agreements for the sharing of biological intelligence, research, diagnostics, personnel, vaccines, antibiotics, medical devices, and treatment/prevention techniques;
 - help with the creation of dedicated regional health surveillance networks;

- assistance to promote sustainable urban development and regeneration schemes; and
- focused response efforts to contend with specific disease-promoting catalysts, such as unprotected sex and the spread of AIDS and other sexually transmitted diseases (STDs) in southern Africa.

Beyond these six health-oriented initiatives, the United States also needs to revisit how it defines security and formulates mechanisms for its provision. Institutional structures that have traditionally focused on narrow statecentric concerns will have to be expanded and developed to accommodate challenges that threaten broader societal interests. Increased cooperation among agencies and departments that have historically had little to do with one another—including defense, justice, intelligence, public health, agriculture, and environment—will also be required, as will new executive functions to coordinate such multidimensional policy responses.

One specific area calling for drastic change is the field of national intelligence. The Intelligence Community as a whole will have to become familiar with new operational contexts that require different analytical techniques, skills, mandates, and information-handling methods. Threat assessments and forecasts will need to be grounded on scientifically formulated models that integrate the work of the medical research sector on new and reemerging diseases. Just as important, security analysts will need to work with public health officials and devote greater attention to the epidemiological literature to track new threats. Overseas monitoring activities will also need to encompass a somewhat wider ambit, focusing on such things as the effectiveness of national medical screening systems; prevailing geopolitical, social, economic, and environmental conditions that affect disease incidence; and state compliance with international health conventions and agreements. Indeed, countries that do not pose an obvious military security danger may be the ones most likely to pose a disease risk owing to poorly developed and underfunded public health systems. Such possibilities will need to be recognized and factored into strategic threat analyses.

Given the influence that the United States retains in such major military/security-focused organizations as the North Atlantic Treaty Organization (NATO), Washington could, finally, play a leading role

in adapting these institutions to take on a more specific public and global health role. In developing such mandates, the United States could usefully capitalize on the nascent multitask framework that has already been established to perform collective political, military, and humanitarian missions around the world.

Measures such as these will require active political input and sustained financial commitment. Reform along the lines suggested above will require federal resources as well as a better understanding of public health issues and how they affect national and global resilience and stability. Considerable policy attention and resources are flowing to build defenses against the relatively unlikely scenario of a large-scale bioterrorist attack. Responses to more commonly occurring and currently more taxing natural outbreaks remain relatively overlooked and underfunded. Serious assessments of the threat posed by infectious diseases suggest that this imbalance needs to be addressed, as a matter of both fiscal responsibility and judicious public policy.

The nature of security has changed in the post-Cold War era. It now bears little, if any, similarity to the relatively stable bipolar division of East-West power that defined international politics for most of the 20th century. There is no large and obvious equivalent of the Soviet Union against which to balance the United States, the world's sole remaining superpower. Indeed, few of today's dangers have the character of direct military aggression emanating from a clearly defined sovereign source. Instead, security, conflict, and the definition of general threat have become more diffuse and opaque, lacking the simple dichotomies of the Cold War era.

A common thread running through many of the "gray area" influences facing the global community is their transnational and amorphous character. Threats cross international borders but generally cannot be linked directly to the foreign policies or behavior of other states; in addition, they involve patterns, processes, and effects that typically manifest themselves in an ambiguous and highly unpredictable manner. The perceived need for rapid policy responses, therefore, is often "concealed" by and subordinated to prerogatives that are more concrete and more easily discerned in a political sense.

The transnational spread of disease represents one issue that warrants especially close attention within this evolving context. Although not new—viruses and bacteria are as old as human life itself—the nature and magnitude of the threat posed by infectious pathogens are greater today than they have ever been in the past, developments in modern science notwithstanding. Not only have deadly and previously unimagined illnesses, such as AIDS, Ebola, Creutzfeldt-Jakob disease, and Legionnaires' disease, emerged in recent years, but established diseases that just a few decades were thought to have been tamed are also returning, many in virulent, drug-resistant varieties.

Statecentric paradigms are clearly unable to deal with issues such as the spread of diseases that originate within national borders but transcend international boundaries and affect the security of people worldwide. This report represents an effort to provide a more comprehensive, holistic definition of security by focusing on the multidimensional nature of the threat posed by infectious disease. The study specifically recognizes that this particular gray area issue is one that cannot be territorially bounded and, therefore, needs to be understood and addressed in a larger global context.

In Chapter Two, we explain an evolving conception of security—human security—and make clear that disease affects societal, political, and economic stability at many levels. We argue that security is not solely a reflection of an individual as part of a secure state, but is a condition that necessarily encompasses wider components such as quality of life.

Chapter Three examines the increasing threat of infectious disease, focusing on “artificial” disease force-multipliers, which serve to greatly exacerbate the incidence and spread of infectious microbes. Each of these factors and its interaction with the spread of disease are discussed.

Chapter Four examines the current HIV/AIDS crisis in South Africa as an extreme example of the all-embracing threat posed by infectious disease. We assess the impact of HIV/AIDS on the country's internal human and wider geostrategic stability and follow this with an examination of Pretoria's response to the epidemic. We also con-

sider the relevance of the South African case, both regionally and in relation to the wider international system.

In Chapters Five and Six, our discussion turns to threat and preparedness in the United States. While the average American is free of fear from death by infection, microorganisms still pose a significant and increasing threat to the country. Many of the factors discussed in Chapter Three regarding the general increased microbial threat apply to the United States, and Chapter Five analyzes the various factors influencing the reemergence of disease in detail.

Chapter Six considers America's overall response capability to microbial agents. It first examines the critical components of U.S. disease prevention and mitigation efforts and then assesses the significance of the main gaps that are currently serving to undermine the effectiveness of the country's overall public health system.

Finally, Chapter Seven outlines our recommendations for mitigating the threat of disease both in America and abroad. We discuss several specific and direct measures that could be instituted to provide more unified and consistent standards of microbial protection across the country. In addition, we look at institutional reform in the security field and consider how structures that have traditionally focused on narrow, statecentric concerns can be expanded to accommodate challenges that threaten broader societal interests.

ACKNOWLEDGMENTS

This report and the work it represents were made possible by the generous support of RAND and, particularly, by the leadership of Brent Bradley, Stephen Rattien, and James Thomson.

The authors wish to express their thanks to Michael Stoto of RAND and Paul Smith of the Asia-Pacific Center for Security Studies, both of whom provided highly useful and insightful comments on the draft version of this study. A special debt of appreciation is also owed to Matt Wheeler, whose excellent research assistance at RAND was integral to the timely completion of the report.

The authors have benefited from numerous discussions with representatives from the U.S. government at all levels as well as government and academic representatives in South Africa. We would like to acknowledge specifically the time spent by the following individuals:

- Patty Quinlisk, M.D., M.P.H., Medical Director and State Epidemiologist for the Iowa Department of Health
- Colonel Benedict Diniega, M.D., Program Director, Preventive Medicine and Surveillance, Office of Assistant Secretary of Defense
- Samantha Willan, Health Economics and HIV/AIDS Research Division, University of Natal, South Africa
- Dr. John Porter, Department of Infectious and Tropical Diseases, London, School of Hygiene and Tropical Medicine, United Kingdom

- Lindy Heinecken, Centre for Military Studies, University of Stellenbosch, South Africa
- Dr. Stephen Field, South African National Blood Service, South Africa
- Martin Schönreich, Institute for Security Studies (ISS), Pretoria, South Africa
- Mark Colvin, Medical Research Council (MRC), Durban, South Africa.

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ABBREVIATIONS

AFB	Air Force base
AIDS	Acquired Immune Deficiency Syndrome
APHIS	Animal and Plant Health Inspection Service
APHL	Association of Public Health Laboratories
ART	Antiretroviral treatment
ATSDR	Agency for Toxic Substances Disease Registry
BIDS	Border Infectious Disease Surveillance
BSL	Biosafety level
BT	Bioterrorism
BW	Biowarfare
CBIRF	Chemical and Biological Incident Response Force
CB-RRT	Chemical and Biological Rapid Response Team
CDC	Centers for Disease Control and Prevention
CIA	Central Intelligence Agency
CISSET	Committee on International Science, Engineering, and Technology
CSTE	Council of State and Territorial Epidemiologists
DARPA	Defense Advanced Research Projects Agency
DoD	Department of Defense
EIN	Emerging Infection Network
EIP	Emerging Infection Program

EIS	Epidemic Intelligence Service
ELC	Epidemiology and Laboratory Capacity
ELR	Electronic Laboratory Reporting
EPI-AIDs	Epidemiological Assistance
Epi-X	Epidemic Information Exchange
ESSENCE	Electronic Surveillance System for Early Notification of Community-Based Epidemics
EWORS	Early Warning Outbreak Recognition System
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FFDCA	Federal Food, Drug, and Cosmetic Act
FoodNet	Foodborne Disease Active Surveillance Network
FRP	Federal Response Plan
FSIS	Food Safety and Inspection Service
GAO	General Accounting Office
GDP	Gross domestic product
GEIS	Global Emerging Infections Surveillance and Response System
HACCP	Hazard Analysis and Critical Control Point
HAN	Health Alert Network
HDOH	Hawaii Department of Health
HHS	(Department of) Health and Human Services
HIV	Human Immunodeficiency Virus
ICEID	International Conference on Emerging Infectious Diseases
IDSa EIN	Infectious Disease Society of America, Emerging Infection Network
INPHO	Information Network for Public Health Officials
IOM	Institute of Medicine
IS/APHIS	International Services/Animal and Plant Health Inspection Service

ISS	Institute for Security Studies
MRC	Medical Research Council (South Africa)
MSM	Men having sex with men
NARMS	National Antimicrobial Resistance Monitoring System
NDMS	National Disaster Medical System
NEDSS	National Electronic Disease Surveillance System
NIAID	National Institute of Allergy and Infectious Diseases
NIC	National Intelligence Council
NIH	National Institutes of Health
NIP	National Immunization Program
NMRT	National Medical Response Team
NNDSS	National Notifiable Disease Surveillance System
NPS	National Pharmaceutical Stockpile
OEP	Office of Emergency Preparedness
PulseNet	National Molecular Subtyping Network for Food-borne Disease Surveillance
RRAT	Rapid Response and Advanced Technology (Laboratory)
SABTS	South African Blood Transfusion Service
SANDEF	South African National Defense Forces
STD	Sexually transmitted disease
TB	Tuberculosis
USAID	U.S. Agency for International Development
USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USAMRMC	U.S. Army Medical Research and Material Command
USDA	U.S. Department of Agriculture
WHO	World Health Organization
ZAR	Rand (South African unit of currency)