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STATEMENT BY

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RESPONSE SYSTEM (DoD-GEIS)

COMMITTEE ON HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS  
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FORESTALLING THE COMING PANDEMIC: INFECTIOUS DISEASE  
SURVEILLANCE OVERSEAS

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Mr. Chairman and members of this distinguished Subcommittee, thank you for inviting me to discuss our Department of Defense international surveillance efforts for emerging infectious diseases overseas. I am Colonel Ralph Loren Erickson, Director of the Department of Defense Global Emerging Infections Surveillance and Response System, a program which is abbreviated as "DoD-GEIS". I'm a physician in the U.S. Army with 26 years of active duty service. A graduate of the Uniformed Services University of the Health Sciences School of Medicine, I also hold a Masters of Public Health degree from Harvard and a Doctorate of Public Health from Johns Hopkins.

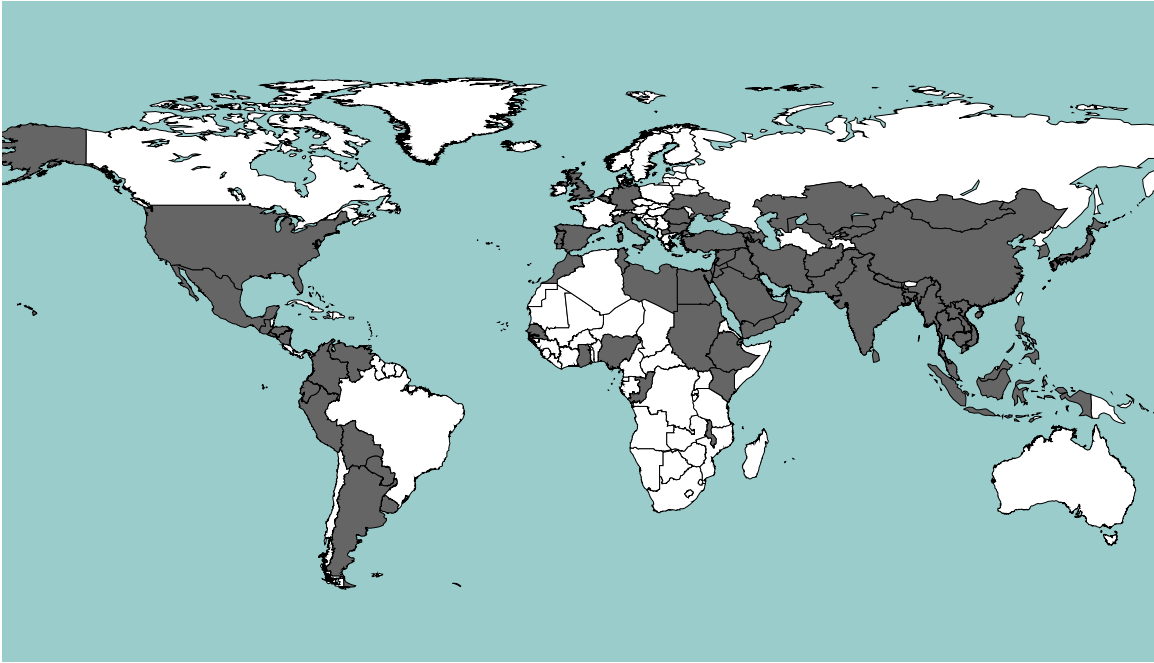
### **OVERVIEW OF DoD-GEIS**

The DoD-GEIS was created in 1996 by a Presidential Decision Directive NTSC-7 that expanded the role of the DoD to address threats to our nation and others posed by emerging and re-emerging infectious diseases (EID). The Institute of Medicine (IOM) of the National Academy of Sciences, in a review of DoD-GEIS in 2001, described it as "a critical and unique resource of the United States in the context of global affairs. It is the only U.S. entity that is devoted to infectious diseases globally and that has broad-based laboratory capacities in overseas settings." A National Intelligence Estimate at that time pointed out that EIDs are a global security issue; they have the capacity to harm US interests abroad through destabilizing key institutions, obstructing trade and human migration, slowing or reversing economic growth, fomenting social unrest, complicating our response to refugee situations by increasing the demand for

humanitarian intervention, and through their potential association with biological terrorism and warfare. The validity of this estimate has been supported by the swift appearance of Severe Acute Respiratory Syndrome and highly pathogenic avian influenza in recent years.

The framework of DoD-GEIS consists of four goals, of which the first, surveillance and detection, is the primary area of concentration. The three other goals are: response and readiness, integration and innovation, and cooperation and capacity building. Each goal encompasses five priority surveillance conditions: (1) respiratory diseases, especially influenza; (2) gastroenteritis syndromes; (3) febrile illnesses (especially malaria and dengue); (4) antimicrobial resistance; and (5) sexually transmissible infections. Anchored by five robust overseas laboratories in Bangkok, Jakarta, Nairobi, Cairo and Lima the DoD-GEIS team operated in 77 different countries worldwide in FY06 and FY07.

<b>Countries in which DoD GEIS-funded activities operate: FY06 and FY07 (n=77)</b>				
Afghanistan	Ecuador	Kazakhstan	Nicaragua	Sudan
Argentina	Egypt	Kenya	Nigeria	Syria
Armenia	El Salvador	Korea	Oman	Thailand
Azerbaijan	Ethiopia	Kuwait	Pakistan	Tunisia
Bahrain	Germany	Kyrgyzstan	Palestine	Turkey
Bangladesh	Ghana	Lao PDR	Paraguay	Ukraine
Belgium	Guam	Lebanon	Peru	United Kingdom
Bolivia	Guatemala	Libya	Philippines	Unites States
Bulgaria	Honduras	Macedonia	Portugal	Uruguay
Burma	India	Malawi	Qatar	Uzbekistan
Cambodia	Indonesia	Malaysia	Republic of Georgia	Venezuela
China	Iraq	Maldives	Romania	Vietnam
Colombia	Iran	Mexico	Saudi Arabia	Yemen
Comoros	Italy	Mongolia	Senegal	
Congo	Japan	Morocco	Spain	
Djibouti	Jordan	Nepal	Sri Lanka	



## **ONGOING DoD-GEIS ACTIVITIES**

DoD-GEIS supports host country and U.S. efforts to develop disease surveillance and early warning mechanisms through laboratory capacity building, training, and technical partnerships to implement and operate surveillance systems worldwide. Efforts to improve outbreak detection timeliness and situational awareness include systems like EWORS and Alerta, which apply computer and information technology in resource-limited settings. EWORS is a hospital-based syndromic surveillance system that uses internet reporting from sentinel sites and automated detection algorithms at system hubs to detect and monitor infectious disease outbreaks and support decision-making by local and national health authorities. EWORS is operating in Indonesia and Laos (and in a different form in Peru). Possibly one of the most significant EWORS accomplishments is the official adoption of this system, earlier this year, by the

government of Indonesia. The government will require central hospitals to implement EWORS in order to receive national accreditation. The Navy NAMRU-2 laboratory in Jakarta will provide technical support and trainer training, but the government of Indonesia plans to provide the other resources necessary to implement this plan.

Alerta is a system operated by the Peruvian Navy and Army in collaboration with the Navy NMRCDC lab in Lima. It uses commercial software (by Voxiva) to enable reporting from sentinel sites (Navy: 86 reporting units; Army: 116 reporting units), to include remote locations in the Amazon, using cell phones, radio, and internet. Like EWORS, Alerta algorithms are run at the system hub to identify outbreaks. Alerta has detected and facilitated the investigation and response to more than 30 disease outbreaks in Peru. These included: influenza, dengue, malaria, and diarrhea. NMRCDC has trained ~900 local nationals through over 100 (2-day) training sessions to operate Alerta. Alerta expansion to other countries in Central and South America is under discussion with SOUTHCOM and CDC-CAP. There are also plans to implement Alerta in Cameroon in FY08.

The list of accomplishments for the last two years goes on. In Jakarta, the Navy's NAMRU-2 lab supported the Ministry of Health response to an outbreak of dengue hemorrhagic fever. The GEIS-NASA Rift Valley Fever (RVF) risk prediction project served warning of an RVF epidemic in East Africa in September 2006, two months before the outbreak began; the Army's USAMRU-K lab deployed a small entomology team to collect specimens in the affected area

before the first cases were reported. The Navy's NAMRU-3 lab in Cairo responded to influenza outbreaks in Iraq and Afghanistan, areas where WHO had little capability; NAMRU-3 has become the WHO influenza regional reference laboratory for the Eastern Mediterranean region and is working in many countries in the Middle East and Central Asia. The Army AFRIMS lab in Bangkok partnered with the Royal Thai Army and Ministry of Public Health to strengthen both military and civilian public health systems in remote areas. The AFRIMS satellite laboratory in Nepal has recently detected (in 2005-2007) and provided advance notice of influenza virus genetic changes that later emerged globally, allowing for better vaccine strain selection worldwide. The Army USAMRU-K lab in Nairobi initiated influenza surveillance in FY06 making it one of very few labs providing reliable data from sub-Saharan Africa. In all, DoD-GEIS partners are currently collecting influenza isolates at 273 distinct sites in 56 different countries. In FY08, the GEIS network has plans to extend lab-based influenza surveillance to the countries of Cameroon and Uganda. In both of these countries the intent is to establish surveillance in both human (seasonal influenza) and migratory wild bird populations. Discussions are also underway to work in Nigeria in either FY08 or FY09.

DoD-GEIS partners made important contributions to surveillance of malaria in FY06 and FY07. An international Malaria Diagnostic Center of Excellence was established in Kisumu, Kenya, by the Walter Reed Army Institute of Research in collaboration with USAMRU-K and the Kenya Medical Research Institute to improve microscopy accuracy in surveillance, research, and clinical

programs. This program has trained over 200 microscopists from 11 countries, achieving significant improvements in performance. All of the Overseas Laboratories continue to monitor antimalarial drug resistance, supplementing Ministry of Health and WHO efforts with sophisticated laboratory methods. Mosquito collections by 18th MEDCOM in Korea, linked with molecular analysis and modeling at the Walter Reed Biosystematics Unit, has precisely identified the species involved in malaria transmission and the reemergence of malaria in the vicinity of the Demilitarized Zone.

### **COORDINATION OF DoD-GEIS ACTIVITIES WITH OTHER FEDERAL AGENCIES**

DoD-GEIS works closely with other Federal agencies who are also engaged in the surveillance of infectious diseases. This collaboration takes many forms and occurs both within the United States and overseas. The DoD and other U.S. Government agencies (e.g. DHHS, DHS, DOS, and CDC) have exchanged fulltime liaison officers to help provide situational awareness of ongoing missions and implement initiatives of mutual interest.

Additionally, GEIS staff members regularly attend other agency meetings. One standing meeting of note is the CDC-DoD Working Group which through the last twenty months (since Jan 2006) has met both in-person and via teleconference several times to share information about our current surveillance activities overseas along with projected plans for the future.

In those countries where DoD has laboratories (Thailand, Indonesia, Peru, Kenya and Egypt), each laboratory commander participates with the American Embassy country team and thus works closely with representatives from other

agencies performing similar work (e.g. HHS, CDC, USAID). DoD-GEIS also has considerable ongoing professional contact with senior scientists and program managers from other Federal agencies through its regular participation with and membership in major organizations such as Institute of Medicine / National Academy of Science (Microbial Threat Forum), U.S. Medicine Institute (round table policy meetings), and the Infectious Diseases Society of America. To enhance the integration of DoD-GEIS surveillance efforts on a global level, we have a fulltime military medical officer assigned to the World Health Organization in Geneva, Switzerland.

**COOPERATION WITH  
THE GLOBAL VETERINARY COMMUNITY  
IN DETECTING EMERGING ZONOTIC DISEASE**

The DoD-GEIS network is replete with talented physicians, veterinarians, entomologists and laboratory professionals drawn from all three of the Armed Services where the culture of One-Health / One-Medicine is already well established.

The Navy's NMRCDC lab in Lima is actively working with veterinarians from San Marcos University and the Global Avian Influenza Network for Surveillance (a project developed by the Wildlife Conservation Society and funded by USAID, WHO and UN Food and Agriculture Organization) to coordinate wild bird surveillance efforts in Peru. This surveillance project began in early 2007. To-date, three different influenza subtypes (not previously seen in Peru) have been identified among migratory birds (H4, H7, & H10). The NMRCDC is also actively training veterinarians and epidemiologists at Cayetano Heredia University, San



Marcos University, and the Instituto Nacional de Salud to improve the Government of Peru's capacity to monitor avian influenza viruses in wild birds.

Since 2003, the Navy's NAMRU-3 lab in Cairo, has worked collectively with the Army's USAMRU-K lab in Nairobi, the National Museums of Kenya ornithology department, the Kenya Medical Research Institute, the Ministry of Environment of Egypt; and the CDC International Emerging Infections Program to collect wild bird surveillance samples to detect circulating strains of avian influenza virus. The Global Disease Detection (GDD) program of the Centers for Disease Control and Prevention (CDC) will soon be integrated into the operations of the NAMRU-3 lab. The NAMRU-3 has collaborated closely with CDC's Kenya field staff in investigating several outbreaks of human disease (e.g. Rift Valley Fever). The NAMRU-3 lab was the first to detect, diagnose and confirm highly pathogenic avian influenza (HPAI) H5N1 in poultry in Afghanistan, Djibouti, Egypt, Iraq, Jordan, and Kazakhstan. As a result of NAMRU-3's surveillance efforts in Ukraine and Ghana, they were also able to confirm the existence of two separate H5N1 HPAI outbreaks among migratory birds and poultry in February 2006 and April 2007, respectively.

As of June 2007, the Army AFRIMS lab in Bangkok has started conducting influenza surveillance of domestic animals (both birds and mammals) that are located near human cases of H5N1 infection in Khamphaeng Phet province, northwest Thailand. The AFRIMS Veterinary BSL-3 laboratory serves as a unique regional asset to study a myriad of zoonotic illnesses and not just

avian influenza. Wildlife and domestic poultry influenza surveillance through the Nepalese Central Veterinary Laboratory is also planned.

The Navy's NAMRU-2 lab in Jakarta presently collaborates with the University of Iowa, Center for Emerging Infectious Diseases (CEID) in conducting avian influenza surveillance. This involves sampling of domestic poultry and waterfowl, wild resident and migratory birds on five Java island sites with over 5,000 samples collected annually. H5N1 screening of >700 samples have identified 8 positive samples (1% positivity rate).

## **CONCLUSION**

The DoD-GEIS is currently a robust, well-developed, international surveillance and response system whose mission is health surveillance through monitoring infectious disease outbreaks using syndromic as well as diagnostic methodologies. DoD-GEIS programs continued to identify and address critical gaps in emerging infectious disease preparedness. DoD-GEIS accomplishments and capabilities have identified it as an important contributor to force health protection for U.S. military forces and an important partner in the global effort to identify and control emerging infectious diseases.