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# GLOBAL HEALTH

# U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance

Statement of David Gootnick, Director
International Affairs and Trade

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# Highlights

Highlights of GAO-08-138T, a testimony before the Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Senate Committee on Homeland Security and Governmental Affairs

# GLOBAL HEALTH

## U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance

## Why GAO Did This Study

The rapid spread of severe acute respiratory syndrome (SARS) in 2003 showed that disease outbreaks pose a threat beyond the borders of the country where they originate. The United States has initiated a broad effort to ensure that countries can detect outbreaks that may constitute a public health emergency of international concern. Three U.S. agencies—the Centers for Disease Control and Prevention (CDC), the U.S. Agency for International Development (USAID), and the Department of Defense (DOD)—support programs aimed at building this broader capacity to detect a variety of infectious diseases.

This testimony describes (1) the obligations, goals, and activities of these programs and (2) the U.S. agencies' monitoring of the programs' progress. To address these objectives, GAO reviewed budgets and other funding documents, examined strategic plans and program monitoring and progress reports, and interviewed U.S. agency officials. GAO did not review capacity-building efforts in programs that focus on specific diseases, namely polio, tuberculosis, malaria, avian influenza, or HIV/AIDS.

This testimony is based on a report (GAO-07-1186) being released today in conjunction with the hearing. GAO did not make recommendations. The agencies whose programs we describe reviewed our report and generally concurred with our findings. We incorporated their technical comments as appropriate.

To view the full product, click on GAO-08-138T. For more information, contact David Gootnick at (202) 512-3149 or gootnickd@gao.gov.
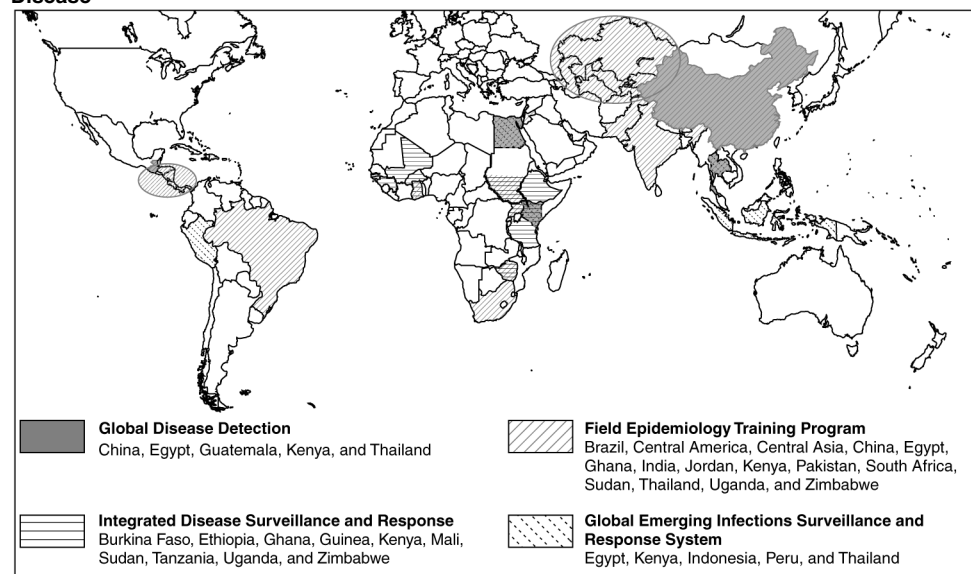
## What GAO Found

The U.S. government operates or supports four key programs (as shown in the graphic below) aimed at building overseas surveillance capacity for infectious diseases. In fiscal years 2004-2006, U.S. agencies obligated approximately $84 million for these programs, which operate in developing countries around the world. Global Disease Detection is CDC's main effort to help build capacity for infectious disease surveillance in developing countries. The Field Epidemiology Training Programs, which CDC and USAID support, are another tool used to help build infectious disease surveillance capacity worldwide. Additionally, USAID supports CDC and the World Health Organization's Regional Office for Africa in designing and implementing Integrated Disease Surveillance and Response in 46 countries in Africa, with additional technical assistance to 8 African countries. DOD's Global Emerging Infections Surveillance and Response System also contributes to capacity building through projects undertaken at DOD overseas research laboratories. USAID supports additional capacity-building projects in various developing countries.

For each of the four key surveillance capacity-building programs, the U.S. agencies monitor activities such as the number of epidemiologists trained, the number of outbreak investigations conducted, and types of laboratory training completed. In addition, CDC and USAID recently began systematic efforts to evaluate the impact of their programs; however, because no evaluations had been completed as of July 2007, it is too early to assess whether these evaluation efforts will demonstrate progress in building surveillance capacity.

**Four U.S.-Supported Programs to Build Overseas Capacity for Surveillance of Infectious Disease**



**Global Disease Detection**
China, Egypt, Guatemala, Kenya, and Thailand

**Field Epidemiology Training Program**
Brazil, Central America, Central Asia, China, Egypt, Ghana, India, Jordan, Kenya, Pakistan, South Africa, Sudan, Thailand, Uganda, and Zimbabwe

**Integrated Disease Surveillance and Response**
Burkina Faso, Ethiopia, Ghana, Guinea, Kenya, Mali, Sudan, Tanzania, Uganda, and Zimbabwe

**Global Emerging Infections Surveillance and Response System**
Egypt, Kenya, Indonesia, Peru, and Thailand

Sources: GAO; Map Resources (map clip art).

**United States Government Accountability Office**

Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to discuss GAO's recent work on U.S. efforts to strengthen international surveillance of infectious diseases.

Infectious diseases are a leading cause of deaths worldwide and represent the third most common cause of death in the United States. As the recent outbreaks and rapid spread of severe acute respiratory syndrome (SARS) and avian influenza[1] have shown, disease outbreaks pose a threat beyond the borders of the country where they originate. The United States thus has a clear interest in building capacity abroad to identify and respond to outbreaks of infectious disease. Effective disease surveillance systems in other countries contribute to lower morbidity and mortality rates and improved public health outcomes, both in those countries and elsewhere in the world.

Earlier efforts to improve surveillance worldwide focused on individual diseases, beginning with global influenza surveillance in the 1940s and followed by surveillance systems for smallpox and polio, among others. In the mid-1990s, recognizing the threat posed by previously unknown infectious diseases, the United States and other countries initiated a broader effort to ensure that countries can detect any disease outbreak that may constitute a public health emergency of international concern. Three U.S. agencies—the Department of Health and Human Services' Centers for Disease Control and Prevention (CDC), the U.S. Agency for International Development (USAID), and the Department of Defense (DOD)—have programs aimed at building this broader capacity to detect a variety of infectious diseases.

Today I will describe U.S. efforts to build developing countries' broader capacity for infectious disease surveillance, specifically: (1) the obligations, goals, and activities of key U.S. programs to develop epidemiology and laboratory capacity and (2) U.S. agencies' monitoring of the progress achieved by these programs. My statement—based on our report released today[2]—does not address U.S. efforts to build international

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[1]In this report, "avian influenza" refers to the highly pathogenic form of this disease, which can cause nearly 100 percent mortality in infected poultry. The disease can also occur in low pathogenic forms that cause only mild symptoms in infected birds.

[2]GAO, *Global Health: U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance*, GAO-07-1186 (Washington, D.C.: Sept. 28, 2007).

capacity for surveillance of specific diseases, namely polio, tuberculosis, malaria, HIV/AIDS, or avian influenza. However, we recently issued reports on domestic preparedness for avian influenza outbreaks and on international efforts to prevent pandemic influenza.[3] In addition, we are beginning to examine, at the subcommittee's request, U.S. capacity to protect against naturally or intentionally introduced outbreaks of zoonotic diseases as well as lessons that can be learned from previous outbreaks in other countries.[4]

For our September 2007 report, we reviewed annual budgets, grants, and project funding for four infectious disease surveillance programs—Global Disease Detection (GDD), Field Epidemiology Training Programs (FETP), Integrated Disease Surveillance and Response (IDSR), and Global Emerging Infections Surveillance and Response System (GEIS)—and examined U.S. agencies' budget, planning, and reporting documents. In addition, we interviewed U.S. and World Health Organization (WHO) officials responsible for implementing capacity-building activities. We determined that the budget and performance data that we obtained had some limitations but were sufficiently reliable for our purposes. We did not make recommendations in our report. We conducted our work from October 2006 through July 2007 in accordance with generally accepted government auditing standards.

DOD, HHS, and USAID provided written comments on a draft of our September 2007 report, generally concurring with our findings. DOD provided information to clarify the extent of GEIS's global involvement, goals, and priorities. HHS provided additional information regarding GDD operations, noting that the GDD centers bring together CDC's existing international expertise in public health surveillance, training, and laboratory methods. Additionally, HHS indicated that disease-specific programs contribute to building surveillance capacity. USAID's comments

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[3]GAO, *Avian Influenza: USDA Has Taken Important Steps to Prepare for Outbreaks, but Better Planning Could Improve Response*, GAO-07-652 (Washington, D.C.: June 11, 2007); *Influenza Pandemic: Efforts to Forestall Onset Are Under Way; Identifying Countries at Greatest Risk Entails Challenges*, GAO-07-604 (Washington, D.C.: June 20, 2007); *Influenza Pandemic: DOD Combatant Commands' Preparedness Could Benefit from More Clearly Defined Roles, Resources, Risk Mitigation*, GAO-07-696 (Washington, D.C.: June 20, 2007).

[4]Zoonotic infections are infections transmitted from animals to humans; examples include human cases of avian influenza, Ebola hemorrhagic fever, and rabies. According to the CDC, approximately 60 percent of all human pathogens are zoonotic.

also focused mainly on the support it provides to disease-specific and other activities that contribute to building surveillance capacity.[5]

# Summary

In 2004-2006,[6] CDC, USAID, and DOD obligated about $84 million for four key programs, as well as additional activities, to develop capacity for the surveillance and detection of infectious diseases abroad.

- *Global Disease Detection (GDD)*. CDC obligated about $31 million for capacity-building activities at GDD centers in China, Egypt, Guatemala, Kenya, and Thailand. GDD centers seek to enhance surveillance, conduct research, respond to outbreaks, facilitate networking, and train epidemiologists and laboratorians overseas.
- *Field Epidemiology Training Programs (FETPs)*. CDC and USAID obligated approximately $19 million to support FETPs in 24 countries, in collaboration with host-country governments. In 2004-2006, these 2-year programs trained approximately 351 epidemiologists and laboratorians in infectious disease surveillance.
- *Integrated Disease Surveillance and Response (IDSR)*. USAID obligated approximately $12 million to support CDC in designing and implementing the IDSR strategy with WHO's Regional Office for Africa (WHO/AFRO) in 46 African countries and in providing technical assistance to 8 of these countries. The IDSR strategy aims to integrate countries' existing disease-specific surveillance and response systems and link surveillance, laboratory confirmation, and other data to public health actions.
- *Global Emerging Infections Surveillance and Response System (GEIS)*. For 2005-2006,[7] DOD obligated approximately $8 million through GEIS for more than 60 infectious disease surveillance projects to help build capacity in 32 countries where the projects were conducted. DOD's GEIS conducts surveillance of infectious diseases abroad to protect military health and readiness; capacity building occurs through its surveillance activities that focus on this goal.
- *Additional activities*. USAID's Bureau for Global Health and USAID missions obligated about $14 million in 2004-2006 for additional activities to build infectious disease surveillance capacity.

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[5]For more information on our scope and methodology and to review agency comments, see GAO-07-1186.

[6]In this testimony, all years cited are fiscal years unless otherwise noted.

[7]Prior to 2005, GEIS funded the overseas laboratories directly, without a project-by-project breakdown.

U.S. agencies monitor activities for the four key surveillance capacity-building programs, including activities such as the numbers of epidemiologists trained, numbers of outbreak investigations conducted, and development of laboratory diagnostic capabilities. To systematically measure their programs' impact on disease surveillance capacity, CDC and USAID recently developed frameworks linking these activities to program goals. For example, in 2006, CDC developed frameworks for evaluating both the FETP and GDD efforts. However, because no evaluations had been completed as of July 2007, it is too early to assess whether these monitoring and evaluation efforts will demonstrate progress in building surveillance capacity. DOD does not plan to evaluate the GEIS program's impact on host countries' surveillance capacity, because it does not consider capacity building to be a primary program goal.

## Background

Dramatic growth in the volume and speed of international travel and trade in recent years have increased opportunities for diseases to spread across international boundaries with the potential for significant health and economic implications. International disease control efforts are further complicated by, for instance, the emergence of previously unknown zoonotic diseases, such as Ebola hemorrhagic fever and avian influenza.[8]

Surveillance provides essential information for action against infectious disease threats. Basic surveillance involves four functions: (1) detection, (2) interpretation, (3) response, and (4) prevention. (See fig. 1.)

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[8]Outbreaks of Ebola hemorrhagic fever, which have occurred in several African countries, are thought to originate from human contact with infected monkeys and spread among humans primarily through contact with infected persons. Outbreaks of avian influenza—spread by birds and sometimes infecting humans—have occurred in nearly 60 countries, killing millions of birds and more than 170 humans in 12 countries throughout Southeast Asia, the Middle East, and Africa as of 2007.

**Figure 1: Elements of a Disease Surveillance System**
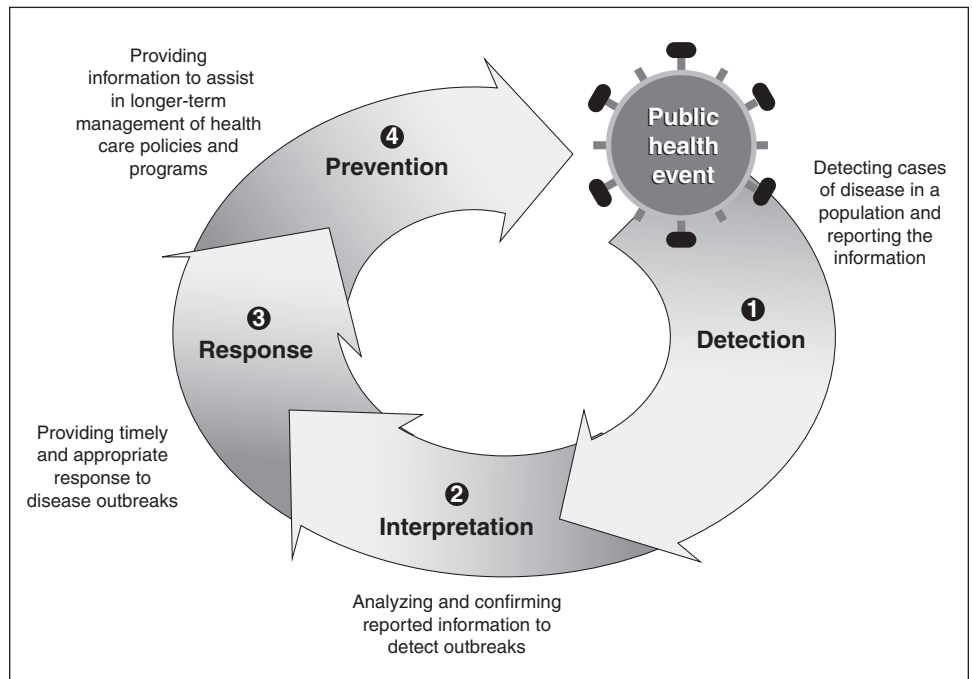


Source: GAO analysis.

Global efforts to improve disease surveillance have historically focused on specific diseases or groups of diseases. For example, as we reported in 2001, the international community has set up surveillance systems for smallpox, polio, influenza, HIV/AIDS, tuberculosis, and malaria, among others, with the goal of eradicating (in the case of smallpox and polio) or controlling these diseases.[9] In 2006, the United States adopted a national strategy to prepare for pandemic influenza outbreaks both domestically and internationally, which included planned funding by U.S. agencies to support influenza surveillance and detection.[10] Such disease-specific efforts can build capacity for surveillance of additional diseases as well.

[9]GAO, *Global Health: Challenges in Improving Infectious Disease Surveillance Systems*, GAO-01-722 (Washington, D.C.: Aug. 31, 2001).

[10]GAO-07-604. Planned funding levels indicate agency budget projects for planning purposes.

The United States acknowledged the need to improve global surveillance and response for emerging infectious diseases in 1996, when the President determined that the national and international system of infectious disease surveillance, prevention, and response was inadequate to protect the health of U.S. citizens. Addressing these shortcomings, the 1996 Presidential Decision Directive NSTC-7 enumerated the roles of U.S. agencies—including CDC, USAID, and DOD—in contributing to global infectious disease surveillance, prevention, and response.

Enhancing capacity for detecting and responding to emerging infectious disease outbreaks is also a key focus of the revised International Health Regulations (IHR). For many years, the IHR required reporting of three diseases—cholera, plague, and yellow fever—and delineated measures that countries could take to protect themselves against outbreaks of these diseases. In May 2005, the members of WHO revised the IHR, committing themselves to developing core capacities for detecting, investigating, and responding to other diseases of international importance, including outbreaks that have the potential to spread. The regulations entered into force in June 2007; member states are required to assess their national capacities by 2009 and comply with the revised IHR by 2012.[11]

# Four U.S.–funded Programs Help Build Capacity for Overseas Infectious Disease Surveillance

U.S. agencies operate or support four key programs aimed at building overseas surveillance capacity for infectious diseases: Global Disease Detection (GDD), operated by CDC; Field Epidemiology Training Programs (FETP), supported by CDC and USAID; Integrated Disease Surveillance and Response (IDSR), supported by CDC and USAID; and Global Emerging Infections Surveillance and Response System (GEIS), operated by DOD. USAID also supports additional capacity-building projects.

In 2004-2006, the U.S. government obligated about $84 million for these four programs (see table 1). Funding for these programs is obligated to support the ability of laboratories to confirm diagnosis of disease as well as the training of public health professionals who will work in their

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[11]The revised regulations specify that each state party shall assess its systems within 2 years of the regulations entering into force on June 15, 2007. They also specify that each state party shall develop systems that meet the new requirements as soon as possible but no later than 5 years from the date the regulations enter into force. In certain circumstances, the revised regulations allow countries to request an extension of up to 4 years to develop systems that meet the requirements.

countries to improve capacity to detect, confirm, and respond to the outbreak of infectious diseases.

**Table 1: U.S. Obligations for Programs Supporting Capacity Building for Infectious Disease Surveillance, 2004-2006**

Dollars in millions

| Program | Agency | Obligations | | | | |
|---|---|---|---|---|---|---|
| | | 2004 | 2005 | 2006 | Amounts provided only as 2004-2006 aggregates | Total |
| GDD | CDC | $6 | $11 | $14 | | $31 |
| FETP | CDC[a] | 2 | 2 | 3 | | $7 |
| | USAID | 2 | 3 | 1 | $6 | $12 |
| IDSR[b] | USAID[c] | 3 | 3 | 2 | 4 | $12 |
| GEIS | DOD | NA[d] | 5 | 3 | | $8 |
| Additional capacity-building activities[e] | USAID | 4 | 4 | 2 | 4 | $14 |
| **Total** | | **$17** | **$28** | **$25** | **$14** | **$84** |

Sources: GAO analysis of CDC data, USAID grant awards, DOD project reports.

Note: There are two main limitations to the reliability of these data. First, the agencies do not track capacity building in their budget systems, and therefore we developed a methodology to identify activities that involved capacity building. The agencies concurred with this methodology and its results. Second, more than half (56 percent) of the $38 million identified as USAID obligations—about 25 percent of total identified obligations—are self-reported estimates by some of the USAID missions and bureaus. We were able to verify the remaining obligations, including obligations from other USAID missions, with documentation, and we determined that the data are sufficiently reliable. For additional information on data reliability, see GAO-07-1186.

[a]CDC also received approximately $2 million from non-U.S. government sources such as private foundations and the World Bank to assist with establishing FETPs. CDC treats these funds as core funds supporting its operations; however, we did not include them in our analysis, because they are not U.S.-appropriated funds.

[b]CDC received funds from the United Nations Foundation to support its work with IDSR. We did not include these funds in our analysis, because they are not U.S.-appropriated funds.

[c]USAID provides funding to CDC to support IDSR efforts.

[d]NA = not applicable. DOD's project reporting system was not in place until 2005.

[e]Additional capacity-building activities include projects supported by USAID's missions in country. This amount does not include obligations from USAID's Egypt mission, which conducted capacity-building activities for infectious disease surveillance from 2004 through 2006 but was not able to determine specifically how much funding went to these activities.

Collectively, these four programs operate in 26 developing countries. (See fig. 2.) To limit duplication and leverage resources in countries where some or all of the capacity-building programs operate, CDC, DOD, and USAID coordinate their efforts by colocating activities, detailing staff to

each other's programs, participating in working groups, and communicating by phone.[12]

**Figure 2: Countries with GDD-, FETP-, IDSR-, or GEIS-Related Activities Supported by U.S. Agencies, 2004-2006**



**Global Disease Detection**
China, Egypt, Guatemala, Kenya, and Thailand

**Field Epidemiology Training Program**
Brazil, Central America,[a] Central Asia,[b] China, Egypt, Ghana, India, Jordan, Kenya, Pakistan, South Africa, Sudan, Thailand, Uganda, and Zimbabwe

**Integrated Disease Surveillance and Response[c]**
Burkina Faso, Ethiopia, Ghana, Guinea,[d] Kenya, Mali, Sudan,[d] Tanzania, Uganda, and Zimbabwe

**Global Emerging Infections Surveillance and Response System**
Egypt, Kenya, Indonesia, Peru, and Thailand

Sources: GAO; Map Resources (map clip art).

[a]Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama participated in the Central America FETP in 2004-2006.

[12]GAO has identified eight practices that agencies can use to enhance and sustain their collaborative efforts, including developing mechanisms to monitor, evaluate, and report on them. See GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, GAO-06-15 (Washington, D.C.: Oct. 21, 2005).

## Global Disease Detection

GDD is CDC's primary effort to build public health capacity to detect and respond to existing and emerging infectious diseases in developing countries, according to CDC officials.[13] In 2004-2006, CDC obligated about $31 million to support GDD capacity-building efforts. GDD's goals are to

- enhance surveillance,
- conduct research,
- respond to outbreaks,
- facilitate networking, and
- train epidemiologists and laboratorians.

Established in 2004, GDD aims to set up a total of 18 international centers that would collaborate with partner countries, surrounding regions, and WHO to support epidemiology training programs and national laboratories and conduct research and outbreak response around the world. Two GDD centers were established in Kenya and Thailand in 2004, and three centers are currently under development in Egypt, China, and Guatemala.[14] In addition, CDC established a GDD Operations Center in Atlanta to coordinate information related to potential outbreaks.

According to CDC officials, GDD capacity-building activities consist of strengthening laboratories, providing epidemiology training, and conducting surveillance activities. CDC aims to establish laboratories with advanced diagnostic capacity—for example, in Kenya, CDC established

[13]In developing GDD, CDC drew on its existing international expertise in public health surveillance, training, and laboratory methods and brought together three previously established programs: FETPs, the International Emerging Infections Program (IEIP), and influenza activities.

[14]The long-term applied epidemiology training program in Guatemala is referred to as the Central America FETP.

several laboratories with biosafety levels 2 and 3.[15] GDD centers conduct formal, 2-year training programs in analyzing epidemiological data, responding to outbreaks, and working on research projects.[16] The centers also conduct short-term training—for example, in 2006, GDD centers trained more than 230 participants from 32 countries to respond to pandemics. In addition, the centers provide opportunities for public health personnel in host countries to work with CDC to evaluate existing surveillance systems, develop new systems, write and revise peer-reviewed publications, and use surveillance data to inform policy decisions.

## Field Epidemiology Training Programs

Assisted by USAID and WHO, and at the request of national governments, CDC has helped countries establish their own FETPs to strengthen their public health systems by training epidemiologists and laboratorians in infectious disease surveillance.[17] CDC and USAID obligated approximately $19 million to support these programs in 2004-2006. Each FETP is customized in collaboration with country health officials to meet the country's specific needs, emphasizing

- applied epidemiology and evidence-based decision making for public health actions;
- effective communication with the public, public health professionals, and the community; and
- health program design, management, and evaluation.

[15]Biosafety addresses the safe handling and containment of infectious microorganisms and hazardous biological materials. Levels of containment range from 1 (lowest) to 4 (highest) and depend on the risk of infection, severity of disease, likelihood of transmission, nature of work being conducted, and origin of the infectious disease agent.

[16]These long-term programs are FETPs that existed prior to the establishment of the GDD centers and are now operating as part of the centers. The FETPs in GDD countries are implemented and supported by CDC in a manner similar to the FETPs in non-GDD countries.

[17]The FETP model is based on CDC's Epidemic Intelligence Service, which began in 1951. In addition to the FETPs, there are also three Field Epidemiology and Laboratory Training Programs in Kenya, Pakistan, and South Africa. These are included in our discussion of FETPs.

CDC and USAID collaborate with host-country ministries of health in Brazil, Central America,[18] Central Asia,[19] China, Egypt, Ghana, India, Jordan, Kenya, Pakistan, South Africa, Sudan, Thailand, Uganda, and Zimbabwe to build surveillance capacity through the FETPs. In addition to receiving formal classroom training in university settings, FETP students and graduates participate in surveillance and outbreak response activities, such as analyzing surveillance data and performing economic analysis, and publish articles in peer-reviewed bulletins and scientific journals. At the end of the 2-year program, participants receive a postgraduate diploma or certificate.

According to CDC, these programs graduated 351 epidemiologists and laboratorians in 2004-2006. As of February 2007, according to CDC, six programs established between 1999 and 2004[20] tracked their graduates and found that approximately 92 percent continued to work in the public health arena after the training. For example, in Jordan, 21 of 23 graduates of its FETP are working as epidemiologists at the central and governorate levels.

## Integrated Disease Surveillance and Response

USAID has supported CDC in (1) designing and implementing IDSR, with WHO/AFRO, in 46 African countries and (2) providing technical assistance to 8 of these countries. In 2004-2006, USAID obligated approximately $12 million to support IDSR, transferring about one-quarter of this amount to CDC through interagency agreements and participating agency service agreements. IDSR's goal is to use limited public health resources effectively by integrating the multiple disease-specific surveillance and response systems that exist in these countries and linking surveillance, laboratory confirmation, and other data to public health actions.

CDC has collaborated with WHO/AFRO in developing tools and guidelines, which are widely disseminated in the region to improve surveillance and response systems. CDC's assistance has included

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[18]In 2004-2006, the Central America FETP, based in Guatemala, trained students from Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. Panama's participation is funded by CDC's Global AIDS Program.

[19]Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan participated in the Central Asia FETP in 2004-2006.

[20]The six programs are in Brazil, Central Asia, Central America, India, Jordan, and Kenya.

- developing an assessment tool to determine the status of surveillance systems throughout Africa,
- developing technical guidelines for implementing IDSR,
- working to strengthen the national public health surveillance laboratory systems, and
- conducting evaluations of the cost to implement IDSR in several African countries.

In addition, CDC is providing technical assistance to eight countries in Africa,[21] which CDC and USAID selected as likely to become early adopters of surveillance best practices and therefore to be models for other countries in the region. With funding from USAID, CDC has undertaken activities in these countries such as evaluating the quality of national public health laboratories in conjunction with WHO, developing a district-level training guide (published in English and French) for analyzing surveillance data, and developing job aids for laboratories to train personnel in specimen-collection methods.

## Global Emerging Infections Surveillance and Response

DOD established GEIS in response to the 1996 Presidential Decision Directive NSTC-7 on emerging infectious diseases, which called on DOD to support global surveillance, training, research, and response to infectious disease threats. In 2005-2006, DOD obligated approximately $8 million through GEIS to build capacity for infectious disease surveillance. GEIS, as part of its mission, provides funding to DOD research laboratories in Egypt, Indonesia, Kenya, Peru, and Thailand[22] as well as to other military research units for surveillance projects located in 36 countries, according to DOD officials,. GEIS conducts many projects jointly with host-country nationals, providing opportunities to build capacity through their participation in disease surveillance projects. GEIS officials noted that they view its primary goal as providing surveillance to protect the health of U.S. military forces and consider capacity building a secondary goal that occurs as a result of surveillance efforts.

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[21]CDC and USAID have supported the implementation of IDSR in Burkina Faso, Ethiopia, Ghana, Kenya, Mali, Tanzania, Uganda, and Zimbabwe. In addition, CDC has supported the implementation of IDSR in Guinea and southern Sudan, funded by the United Nations Foundation.

[22]The laboratories are under the command of the U.S. Army in Kenya and Thailand and the U.S. Navy in Egypt, Indonesia, and Peru.

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GEIS funded more than 60 capacity-building projects in 2005 and 2006,[23] supporting activities such as establishing laboratories in host countries, training host-country staff in surveillance techniques, and providing advanced diagnostic equipment. For example, in Nepal, GEIS funded surveillance of febrile illnesses, such as dengue fever, and through this project provided a field laboratory with training and equipment to conduct advanced diagnostic techniques. GEIS has also funded more direct training; for example, the laboratory in Peru conducted an outbreak-investigation training course for public health officials from Peru, Argentina, Chile, and Suriname in 2006 with GEIS funding.

## Additional Capacity-Building Activities

Funding provided by USAID's Bureau for Global Health and USAID missions has supported additional activities to build basic epidemiological skills in developing country health personnel. In 2004-2006, USAID obligated about $14 million for these activities. For example, USAID funded a WHO effort to assist the government of India in improving disease surveillance, including strengthening laboratories, developing tools for monitoring and evaluating surveillance efforts, and creating operational manuals for disease surveillance.

## Agencies Monitor Surveillance Capacity-Building Activities and Have Begun to Evaluate Programs' Impact

The U.S. agencies operating or supporting the disease surveillance capacity building programs collect data to monitor the programs' activities. CDC and USAID also recently began systematic efforts to evaluate program impact, but it is too early to assess whether the evaluations will demonstrate progress in building surveillance capacity.

- *GDD*. Since 2006, CDC has monitored the number of outbreaks that GDD has investigated, the numbers of participants in GDD long-term and short-term training, and examples of collaboration among GDD country programs. In addition, in 2006, CDC developed a framework for evaluating progress toward GDD's five goals[24] and collected data for 8 of 14 indicators. (Fig. 3 shows the GDD evaluation framework.) However, as of July 2007, the agency had not collected data on the two surveillance indicators to evaluate the program's contribution to improved surveillance.

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[23]A breakdown of individual project data is not available prior to 2005, which is when GEIS began awarding funding for individual projects to the DOD overseas laboratories. Prior to that, GEIS obligated a fixed amount to each laboratory.

[24]GDD's five goals are surveillance, research, outbreak response, networking, and training.

**Figure 3: Framework for Evaluating Impact of GDD**

| Outbreak investigation and response | Surveillance | Research | Training | Networking and communications |
|---|---|---|---|---|
| Number and proportion of outbreaks of priority conditions that are investigated with GDD response center assistance | Number and proportion of priority diseases for which population-based incidence can be monitored over time | Number of peer-reviewed articles published | Number of graduates from long-term training programs or participants in short-term training programs | Number of collaborations between response centers |
| Number and proportion of GDD outbreak investigations for which laboratory analysis yielded a confirmed cause | Proportion of laboratory samples collected through surveillance activities submitted for laboratory analysis that were successfully processed and reported | Number of presentations (oral or poster) at international scientific meetings | Number and proportion of trained graduates who hold public health leadership positions | Improvements in standardization of surveillance systems and training approaches across response centers |
| Timeliness of response to outbreaks of priority conditions | | Number of new pathogens described | | Timeliness of reporting of outbreaks of priority conditions to GDD Operations Center |
| Timeliness of specimen shipment between GDD response center and Atlanta | | | | |

Source: Centers for Disease Control and Prevention.

- *FETP*. CDC has collected data such as the numbers of FETP trainees and graduates, the numbers of FETP graduates hired by public health ministries, the number of outbreak investigations conducted, and the number of surveillance evaluations conducted. In 2006, CDC developed a framework for monitoring and evaluating FETPs' impact on countries' health systems, with 13 indicators related to FETP activities (see fig. 4 for the FETP indicators). CDC hopes to implement the framework fully by 2009, but because FETPs are collaborations between CDC and the host countries, the framework's implementation depends on country cooperation.

**Figure 4: Indicators for Evaluating Impact of FETPs**

- Number of graduates
- Number of investigations of acute health events
- Planned studies conducted
- Surveillance systems data analyzed and used
- Local/regional dissemination of trainee/officer and program work
- Presentations to international scientific conferences
- Peer-reviewed publications
- Strengthened public health workforce
- Surveillance system improved/expanded by program and/or trainees
- Evidence-based public health action for acute health events improved/expanded by program and/or trainees
- Evidence-based public health programs/projects started because of graduates, programs, and/or trainees
- Evidence-based policies/regulations created or improved because of programs and/or trainees
- National and/or regional public health professional network of graduates

Source: Centers for Disease Control and Prevention.

- *IDSR.* Since 2000, CDC has collected data on activities completed under its IDSR assistance program, including the number of job aids developed, the training materials adopted, and the number of training courses completed, and it reports on these activities annually to USAID. In 2003, WHO/AFRO adopted 11 indicators, developed with input from CDC and USAID, to monitor and evaluate progress in implementing IDSR in Africa (see fig. 5 for the IDSR indicators). According to WHO/AFRO, 19 of 46 African countries reported data in 2006 for at least some of these indicators, showing some success in IDSR implementation; however, U.S. agencies cannot require the collection of data in the remaining countries that did not report on the indicators, because IDSR is a country-owned program. Separately, in 2005, CDC completed an evaluation of IDSR implementation in 4 of the 8 countries where it assists with IDSR—Ghana, Tanzania, Uganda, and Zimbabwe—and, using a set of 40 indicators based on WHO guidance,[25] found that these countries had implemented most of the elements of IDSR.

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[25]World Health Organization, *Protocol for the Assessment of National Communicable Disease Surveillance and Response Systems: Guidelines for Assessment Teams,* WHO/CDS/CSR/ISR/2001.2 (Geneva: 2001).

**Figure 5: Indicators for Evaluating Impact of IDSR**

- Proportion of health facilities submitting weekly or monthly surveillance reports on time to the district level
- Proportion of districts submitting weekly or monthly surveillance reports on time to the next higher level
- Proportion of cases of diseases targeted for elimination or eradication and any other diseases selected for case-based surveillance, which were reported to the district using case-based or line listing forms
- Proportion of suspected outbreaks of epidemic-prone diseases notified to the next higher level within 2 days of passing the epidemic threshold
- Proportion of districts with current trend analysis (line graphs) for selected diseases
- Proportion of reports of investigated outbreaks that include analyzed case-based data
- Proportion of investigated outbreaks with laboratory results
- Proportion of confirmed outbreaks with a nationally recommended public health response
- Case fatality rates for outbreaks of priority diseases
- Attack rates for outbreaks of epidemic-prone diseases
- Proportion of epidemics detected at regional and national levels through analysis of surveillance data from districts and that were missed by the district level

Source: World Health Organization.

- *GEIS*. Since 2005, DOD has monitored GEIS capacity-building activities through individual project reports that detail each activity completed, such as training for staff involved in surveillance studies and development of laboratory diagnostic capabilities. According to GEIS officials, DOD does not plan to develop a framework to monitor and evaluate the impact of GEIS on countries' surveillance capacity, because capacity building in host countries is not GEIS's primary purpose. Rather, GEIS's goal is to establish effective infectious disease surveillance and detection systems with the ultimate aim of ensuring the health of U.S. forces abroad. However, GEIS has reviewed some of its surveillance projects,[26] and GEIS officials stated that the program's activities in the host nations have led to improved surveillance capacity for infectious diseases.

Mr. Chairman, this concludes my statement. I would be happy to respond to any questions you or other members of the subcommittee may have at this time.

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[26]In addition, the Institute of Medicine completed a review of GEIS in 2001 and DOD officials told us that IOM was nearing completion of a second evaluation of GEIS pandemic influenza activities as of September 2007.

## GAO Contact and Staff Acknowledgment

For further information about this testimony, please contact David Gootnick at (202) 512-3149 or gootnickd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Audrey Solis, Julie Hirshen, Reid Lowe, Diahanna Post, Elizabeth Singer, and Celia Thomas made key contributions to this testimony and the report on which it was based. David Dornisch, Etana Finkler, Grace Lui, Susan Ragland, and Eddie Uyekawa provided technical assistance.

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