

Virtual Mentor

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The Epidemic Intelligence Service—The Centers for Disease Control and Prevention’s Disease Detectives

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Introduction

The Epidemic Intelligence Service (EIS) of the Centers for Disease Control and Prevention (CDC) is a unique 2-year postgraduate program of service and on-the-job training for health professionals interested in epidemiology. Since 1951, approximately 2600 EIS officers—CDC’s “disease detectives”—have graduated from the program. In addition to the training gained through investigating disease outbreaks, natural and man-made disasters, and other public health emergencies, the program provides formal instruction to its trainees through courses in epidemiology, biostatistics, public health ethics and law, evaluation of surveillance systems, scientific writing, and prevention effectiveness. The 2-fold mission of EIS is training and service. One of the many ways that EIS delivers on its service mission is by forming the backbone of CDC’s ready-response capability. When CDC is called upon to furnish epidemiologic assistance to our public health partners both domestically and internationally, an EIS officer is often the first one dispatched to the site.

Historic Overview

The EIS was the brainchild of Dr Alexander D. Langmuir, chief epidemiologist at the Communicable Disease Center (later renamed the Centers for Disease Control and Prevention) following his recruitment from a faculty position at Johns Hopkins University in 1949. One of Langmuir’s first priorities upon assuming his new post was to recruit epidemiologically qualified personnel for the young agency. His initial efforts identified only 2 physicians who were interested in the position, and neither candidate was trained as an epidemiologist [1]. Dr Langmuir subsequently proposed that CDC establish a program to train epidemiologists for public health service. After initial attempts to fund this training program failed, Dr Langmuir changed his tack and argued that the United States needed a trained cadre of epidemiologists who could be available to detect and respond to a clandestine biologic attack, presumably by the Soviet bloc [2]. Congress responded with funding for the new program, and the first class of 22 trainees was enrolled in July of 1951. Although the stated rationale for the program was biodefense, Dr Langmuir later wrote, “The ultimate objective of this program is to promote a wider understanding and appreciation of epidemiologic approaches to the problem of disease control in war and peace” [1].

The early activities of the EIS focused on responding to limited public health emergencies and supplying technical consultation to state and local health departments. A watershed event was the development of the first formalin-inactivated vaccine for polio—the Salk vaccine. The vaccine was released amid great fanfare on April 12, 1955, the 10th anniversary of the death of President Franklin D. Roosevelt, perhaps polio’s most famous victim. Dr Langmuir had established a plan of surveillance for polio, largely in anticipation of vaccine failures. At the time, the future of the polio vaccination campaign was in jeopardy due to pleas that vaccinations be stopped in the face of vaccine-induced cases of the disease. In response, Dr Langmuir traveled to Washington, DC, where he lobbied for and received permission to institute an emergency national surveillance program for polio. This effort required the commitment of the entire cohort of EIS officers at that time, 11 second-year and 32 first-year officers.

On April 25, a report of a baby in Chicago with polio, inoculated 9 days earlier, was reported to CDC. An EIS epidemiologist arrived to investigate the next morning. The following day, an EIS officer in Napa, California, called to report a second case. By the end of that day, a total of 6 cases had been identified. By May 6, vaccine produced by the Cutter Company was implicated as the likely source of infection. Vaccine distribution was temporarily suspended until the factory could be checked and appropriate safety measures instituted [3]. During this incident, CDC, through EIS, demonstrated its ability to respond rapidly to a public health emergency.

In the 50 years of the EIS program’s existence, training has expanded beyond the original emphasis on infectious diseases to include all aspects of public health. In many ways, these changes reflect the evolution of the mission of the agency as a whole—CDC has grown from the Communicable Disease Center to become the Centers for Disease Control and Prevention. This evolution is clearly demonstrated by an examination of the types of epidemiologic assistance (EPI-AID) investigations conducted during the first 5 years of the program, 1952-1956, compared with those conducted during the most recent 5-year period, 2001-2005. During the first 5 years, 100 percent of the EPI-AID investigations were for infectious disease problems. During the last 5 years, infectious disease has continued to be a prominent focus (80 percent), but environmental (9 percent), chronic (3 percent), injury (4 percent), and other (5 percent) health-related problems have also been investigated. The international component of the program is also more apparent, with 17 percent of the investigations responding to international challenges. Of particular note is that during both periods, 4–5 percent of the investigations involved Category 1 biologic terrorism agents [4].

EIS Response to September 11, 2001

On Tuesday, September 11, 2001, CDC moved quickly to respond to the terrorist attacks in New York City (NYC) and at the Pentagon by activating its Director’s Emergency Operations Center (DEOC). EIS personnel were among the first to help staff DEOC. Later that day, 2 EIS officers were deployed to NYC to assist the Department of Health and Mental Hygiene with hospital needs and surveillance of injuries to citizens and rescue workers. Health authorities were also concerned that a clandestine biologic weapon release might coincide with the attacks on the World Trade Center. Three days later, on September 14, 34 more EIS investigators were deployed to

establish the syndromic surveillance system among 15 hospitals in Manhattan and the surrounding boroughs. Still others were assigned to Washington, DC, to help establish syndromic surveillance around the Pentagon.

On October 4, 2001, the Florida Department of Health received a report of a possible case of inhalation anthrax in a Palm Beach resident. The Florida EIS officer immediately investigated the case report. That same day a team of 6 EIS and other CDC staff were flown in to assist with the investigation, and 4 EIS officers were sent to North Carolina to investigate the activities of the case-patient who had recently visited that state. Following the identification of a patient associated with the NBC studios in New York with cutaneous anthrax, 10 of the EIS investigators assigned to NYC syndromic surveillance spent the next 4 days helping collect epidemiological data, clinical samples, and counseling NBC employees. Over the next 4 weeks, an additional 27 EIS officers participated in the anthrax investigation in NYC.

Fifty EIS staff went to Washington between October 17 and January 14 to assist with the investigation of anthrax exposure in a letter sent to Senator Tom Daschle. As the investigation was expanded and postal system dissemination of the agent was discovered, EIS officers were also deployed to New Jersey and Connecticut. A total of 113 EIS officers were in the field during the anthrax investigations, and most of the rest of them assisted with staffing of the DEOC or state response centers.

In its initial response to the anthrax event, EIS established surveillance, tracked exposed individuals, and collected epidemiologic data to identify risk factors for exposure and disease. As the investigation shifted from the initial phase of “crisis response” to “consequence management,” EIS officers became increasingly involved in the efforts to provide antibiotic prophylaxis to potentially exposed workers; their duties here included data collection, logistical management, and risk communication.

Other Large-Scale Deployments

Since the events of September 11 and the subsequent anthrax outbreaks, EIS has been asked to assist with CDC’s response to other large-scale public health emergencies. Although these have not been biologic terrorism events, certain characteristics of all large-scale deployments are comparable. During the fall of 2002 West Nile virus spread across the southern and midwestern United States. EIS conducted investigations in Arkansas, Georgia, Illinois, Louisiana, and Mississippi, assisted with the director’s emergency operations in Atlanta, and led nationwide studies of West Nile virus transmission associated with human tissue transplantation and blood transfusion.

A much larger and more intense public health response occurred after identification of severe acute respiratory syndrome (SARS) during the spring of 2003. Again, EIS played an early and important role in the CDC response. EIS officers were the first personnel detailed to Director’s Emergency Operations Center when it was activated. As with any biologic terrorism event, the EIS served as CDC’s primary surge-capacity resource. During the course of the SARS outbreak, 102 of 161 EIS officers participated in CDC’s response efforts, while field-based staff assisted with activities in their individual states. Seventeen of the 102 were deployed internationally.

Following in the wake of Hurricanes Katrina and Rita, EIS officers at the disaster sites helped establish surveillance for injuries and illness in the affected areas, conducted needs assessments among displaced persons, investigated disease outbreaks, and temporarily replaced local public health workers forced to evacuate by the storms. During the 6 weeks after Katrina's landfall, EIS participated in 105 field deployments and another 18 assignments to DEOC.

Conclusion

Although the EIS program was created in response to the potential threat of a biologic attack, the driving philosophy of the program from its inception has been to train epidemiologists to respond to the whole spectrum of public health emergencies. We believe that the skills acquired by these epidemiologists equip them to respond to a biologic terrorism event. EIS officers continue to offer daily, ongoing support to CDC and to our state, local, American Indian/Alaska Native, and international partners. In recent years, EIS has repeatedly risen to the challenges posed by large-scale public health emergencies and has successfully supported CDC's public health mission as well as that of other federal government agencies.

References

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