Commentary

Introduction: The Centers for Disease Control and Prevention’s Epi-Aids—A Fond Recollection

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The Epidemic Intelligence Service (EIS) has served the United States and the world for >58 years by being an extraordinary apprenticeship in the fundamentals of practical field epidemiology: a training program, a professional entry point, the basis for lifelong careers, and a closely supervised and mentored opportunity for research, analysis, and community service. Epidemic-assistance investigations, a key element of the EIS experience, are the written summaries of each field investigation undertaken by the EIS officer. The resulting reports enter the record of the Centers for Disease Control and Prevention (CDC), provide scientific feedback to the state and locality where the epidemic or health problem occurred, and often form the basis for a subsequent manuscript to be submitted to a peer-reviewed medical journal. The EIS Program was created in 1951 to be a defense against potential bioterrorism, serve the immediate needs for field investigation, and provide for future workforce demands by combining epidemiology and laboratory science. During the past 60 years, CDC and public health practitioners have broadened their areas of responsibility by adding programs in reproductive health, environmental health, chronic diseases, nutrition, injury control and prevention, and noncommunicable disease risk factors. Epidemic-assistance investigations have evolved similarly. The papers in this Journal supplement reflect the evolution of public health responsibilities and the growth and development of CDC. They are a testimony to the value of clear, concise information and analysis, communicated to those who need to know as a public health and societal good.

Centers for Disease Control and Prevention (U.S.); epidemics; public health; world health

Abbreviations: CDC, Centers for Disease Control and Prevention (formerly the Communicable Disease Center); EIS, Epidemic Intelligence Service; EISO, Epidemic Intelligence Service officer; Epi-Aid, epidemic-assistance investigation.

The Epidemic Intelligence Service (EIS), now serving the United States and the world for more than 58 years, has provided a unique resource for public health. It has been an extraordinary apprenticeship in the fundamentals of practical field epidemiology: at once a training program, a professional entry point, the basis for lifelong careers, and a closely supervised and mentored opportunity for research, analysis, and community service. Few participants complete the 2 years of EIS without undergoing a profound evolution of professional development and altered career trajectory. A 1963 investigation of a suspect case of smallpox in a child (ultimately not confirmed) drove one of us (W. F.) into a 12-year obsession with eradicating smallpox from the world.

Epidemic-assistance investigations (Epi-Aids) are a key element of the EIS experience in that they are the written summaries of each field investigation undertaken by the EIS officer (EISO). The resulting reports enter the record of the Centers for Disease Control and Prevention (CDC), provide scientific feedback to the state and locality where the epidemic or health problem occurred, and often form the basis for a subsequent manuscript to be submitted to a peer-reviewed medical journal. Indeed, throughout approximately 6 decades, rarely has any month’s issues of the New England Journal of Medicine or the Journal of the American Medical Association not included at least one paper describing a health problem the origins of which began as an Epi-Aid. CDC’s Morbidity and Mortality Weekly Report (available at http://www.cdc.gov/mmwr) offers episodes of threats to the public health, and these articles also have roots in Epi-Aids.
The EIS Program was created by Alexander Langmuir in 1951 to be a defense against potential bioterrorism, serve the immediate needs for field investigation, and provide for future workforce demands by combining epidemiology and laboratory science. It began at a time when CDC’s initials stood for the Communicable Disease Center; thus, for many years, the focus of both the agency and its highly visible and productive training program of disease detectives was on infectious diseases. Indeed, a conceptual basis for EIS was similar to the medical police promoted by Johan Peter Frank in the Germanic states in the late 18th and early 19th centuries.

During the past 60 years, CDC and public health practitioners have broadened their areas of responsibility, consistent with changing burdens of illness and opportunities to apply preventive measures within populations. Thus, CDC added programs and operational units in reproductive health, environmental health, chronic diseases, nutrition, injury control and prevention, and noncommunicable disease risk factors (e.g., tobacco, diet, and physical activity). CDC’s workforce has changed considerably from a preponderance of infectious disease epidemiologists, microbiologists, and statisticians to now include epidemiologists in all areas of public health, nutritionists, evaluation and communication specialists, health educators, behavioral and social scientists, health policy analysts, economists, modelers, and other professions. Similarly, the composition of the EIS has evolved from predominate physicians and a limited number of veterinarians and nurses to a mixture of persons with many different doctoral degrees representing many different disciplines (e.g., MDs, PhDs, DPHs, ScDs, DDSs, JDs, and DVMs).

The Epi-Aid has evolved in a similar manner in that it was first used at CDC in 1946 but became a standard feature of field investigations in 1951 with the beginning of the EIS Program. For more than 20 years, it focused almost exclusively on infectious disease outbreaks, but as this special Journal supplement illustrates, the focus of the Epi-Aid has grown into new areas.

The EIS training experience and the Epi-Aid are elements of population-based health care or public health that have parallels with individual-based or clinical health care. In particular, the EIS experience teaches the trainee to regard health problems in a population-based context, just as clinical medicine focuses on the individual. Investigating an epidemic is a logical and rational step-by-step process that parallels the taking of a medical history and physical examination. The Epi-Aid is the analogue of the medical record and discharge summary-cum-case report. It provides closure with its description of the problem, the information accumulated during the investigation, an analysis of the data, conclusions, and actions taken to correct or alleviate the problem. Similarly, the EISOs’ weekly epidemiologic case presentations and annual EIS conference provide the parallel oral communication experience and trial by fire of the written Epi-Aids. Together, they advance the skills, knowledge, and confidence of the apprentice field epidemiologist.

The Epi-Aid has proven its value repeatedly in diverse ways. For someone being trained as a field epidemiologist, it forces clear, economic expression, both descriptive and analytic. It pushes the trainee to consider the data collected, its analysis and interpretation, conclusions that can be drawn, information that is missing, and corrective and preventive steps that should be taken. Epi-Aids must be able to stand the critiques of the EISO’s peers and supervisors, state and local officials, academicians, and sometimes the press, the affected population, and the larger population at potential risk. Through this model, the trainee hones his or her skills in writing and thinking.

Meanwhile, the supervision and mentoring of EISOs, including oversight of their Epi-Aids, sharpens the supervisor's scientific and epidemiologic skills and thinking. It permits the supervisor to interact in a concrete, evidence-based way on a full set of epidemiologic and public health skills: study design, statistical methods, data analysis, conclusions that follow from the data, study weaknesses, appropriate recommendations, public health practicalities, and effective communication. Both supervisee and supervisor are challenged and learn together.

For the institution, a record of a critical responsibility being fulfilled has been established and is available for review, revisiting, and consideration for years to come. An Epi-Aid investigating Pontiac fever in Michigan in 1968 can be pulled out to compare with Legionnaires disease in 1976 in Philadelphia, Pennsylvania. Influenza outbreaks from each decade can be assessed in a progression of drifts and shifts. Three Mile Island and Love Canal can offer insights into risks and hazards, as well as community responses, in regard to more recent environmental disasters.

For the state and local health departments where the requests for assistance are initiated, Epi-Aids describe the findings, laboratory tests, and data analysis methodologies for constituents. They typically provide closure on a public health threat, with insights and recommendations vetted by national specialists.

In our own EIS experiences (classes of 1962 (W. F.) and 1972 (J. K.),) we can look back through the rosy lenses of memory on writing Epi-Aids and getting them approved. A period existed when vacations (or “annual leave” as the government terms it) were delayed pending submission and approval of completed Epi-Aids. Whether hepatitis B transmission in a midwestern state penitentiary in 1974 or a diarrheal disease outbreak at a national park in 1975, considerable pressure was placed on the EISO to type the report (before the advent of word processors and computers), make sure all relevant data were incorporated, obtain sign-off by key participants, and address critiques of previous drafts. We became better writers, thinkers, and epidemiologists through this process. We also learned the art of compromise and teamwork. Those who did not were given the opportunity to accrue rather than expend their annual leave.

Later in our careers, in supervisory roles, we valued Epi-Aids as chapters of scientific and public health history—Legionnaires disease, acquired immune deficiency syndrome, hantavirus pulmonary syndrome, bioterrorism, toxic shock syndrome, Reye syndrome, and others—and as evidence of CDC’s productivity, creativity, and scientific and societal contributions. The papers that follow in this dedicated supplement place these chapters in the context of the evolution of public health responsibilities and the growth and development of CDC. They are a testimony to the value of clear, concise information and analysis, communicated to those who need to know as a public health and societal good.
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