Examining the Front Lines of Local Environmental Public Health Practice: A Maryland Case Study

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Objective: Local environmental public health (EPH) is the foundation of a nation’s environmental protection infrastructure. With increasing pressure to demonstrate the ability of EPH activities to effectively protect health, the Johns Hopkins Center for Excellence in EPH Practice, as part of the Centers for Disease Control and Prevention’s (CDC’s) EPH capacity-building effort, developed the Profile of Maryland Environmental Public Health Practice. This profile offers an examination of front-line local EPH strengths, needs, challenges, and provides recommendations to strengthen the EPH infrastructure. Methods: A multistep process was conducted, including site visits to all of Maryland’s 24 local EPH agencies and a questionnaire addressing administrative structure, communication, funding, workforce, crisis management, technology, and legal authority, completed by local EPH directors. Results: The Maryland Profile revealed a dedicated and responsive workforce limited by a neglected, fragmented, and underfunded EPH infrastructure. Recommendations regarding leadership, workforce, training, technology, communication, and legal authority are offered. Conclusions: This research has implications for the national EPH infrastructure. Recommendations offered are consistent with the CDC’s findings in A National Strategy to Revitalize Environmental Public Health Services. These initiatives provide a foundation for determining the efficacy of EPH efforts and identifying gaps to strengthen the EPH infrastructure to better protect the nation’s health. In framing this study, the researchers used the Pew Environmental Health Commission definition of environmental health:

Those aspects of human health, including quality of life, that are determined by interactions with physical, chemical, biological and social factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that may adversely affect the health of present and future generations.2(p6)

Methods

The multistep process included a half-day site visit to each of the 24 local EPH divisions in Maryland and the

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distribution of a written questionnaire to each local EPH director. The site visits included discussion of front-line local EPH strengths, needs, and priorities, as well as a tour of the local community. Topics discussed during the visit included local administrative structure, communication, funding, workforce, crisis management, technology, and legal authority. The questionnaire addressed these same topic areas and was developed in collaboration with the JHU Center’s Advisory Committee, which included federal, state, and local EPH practitioners, and was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board. The questionnaire was distributed to the EPH directors following site visits and was completed and returned by mail. By the end of 2004, site visits were completed with all 24 local Maryland EPH divisions and 22 discussion guides had been returned (a 92% response rate). The data were collected and stored in a Microsoft Access database and analyzed using Microsoft Excel.

● Results

The results from the site visits and questionnaire responses are outlined below in the following categories: EPH structure, communication, funding, workforce, growth and development, crisis management, technology, and legal authority. These findings, along with results from other national initiatives, provide insight into some of the challenges faced by local EPH, and potential opportunities to enhance EPH practice throughout the country and facilitate the advancement of an evidence-based EPH system to better protect the public’s health.

Maryland EPH structure

The practice of EPH in Maryland is conducted mainly by state and local agencies. At the state level, the majority of EPH services are delivered by the Maryland Department of Health and Mental Hygiene (DHMH) and the Maryland Department of the Environment (MDE). While responsible for different functions today, these agencies share a common history; MDE was created in 1987 out of programs from the DHMH’s Office of Environmental Programs and Maryland’s Department of Natural Resources. These state agencies play a critical role in coordinating efforts across the state through activities such as the development of standard protocols and regulations.

However, most EPH services are provided at the local level by the 24 county- or city-based EPH divisions housed within the local health departments. These local EPH divisions provide a core set of services (Figure 1). In addition to these core services, some divisions develop programs to address specific local area needs, such as Baltimore City’s lead poisoning prevention program.

Communication and collaboration

Interagency

Effective communication and collaboration among EPH agencies and Maryland’s local communities is critical to ensuring effective EPH protection, yet most EPH divisions reported a confusing and disjointed structure among federal, state, and local agencies. This fragmented structure has resulted in a leadership vacuum with no one agency or individual in charge. Consequently, there is often an inability to make quick decisions on critical EPH issues. This lack of decisive leadership often leaves local EPH practitioners unable to adequately address community concerns and needs. These findings have been substantiated in many national EPH examinations over the last two decades. The Institute of Medicine’s landmark 1988 report, “The Future of Public Health” concluded the following:

The removal of environmental health authority from public health agencies has led to fragmented responsibility, lack of coordination, and inadequate attention to the public health dimensions of environmental issues.

The “Who’s in Charge?5 and the “Environmental Web”6 articles completed in the 1990s by Johns Hopkins researchers further documented the frailty of environmental health programs and lack of leadership in the field. In 2001, the Pew Environmental Health Commission found that “there is a national leadership void, resulting in little or no coordination of environmental health activities.”7 The 2003 CDC report, A National Strategy to Revitalize Environmental Public Health Services, found “informational barriers among environmental public health professionals, especially in different agencies, have long prevented rapid sharing of information . . . and too often information does not flow smoothly to and from federal agencies to state and local professionals.”8

Recently, Maryland has made appreciable progress in addressing some of these communication issues. The MDE and DHMH representatives now routinely attend the Maryland Association of County Health Officers and the Maryland Conference of Local Environmental Health Directors monthly meetings. These meetings provide opportunities for local and state EPH leadership to coordinate efforts and share information. In addition, a state-based data coordination committee was established to facilitate the standardization and sharing of health and environmental data and a
long-standing local-state EPH liaison committee has recently been assigned high-level staff with the authority to implement committee recommendations. These interagency efforts are a critical first step and must continue to adequately address EPH concerns.

**Community**

Findings from the *Maryland Profile* revealed that EPH suffers from an “invisibility problem,” which can be observed when the general public fails to recognize the existence or importance of EPH preventive actions, such as food inspections, because no public health crisis, such as a food-borne illness outbreak, occurred. These invisibility problems were also noted in the CDC’s *A National Strategy to Revitalize Environmental Public Health Services* as follows:

> [A]n important communication challenge faced by the environmental health workforce is to make the public and decision-makers aware of the environmental health components of public health agencies.\(^{1,2}\)

While prevention is the foundation of all public health programs, the lack of a discernable crisis leads both the community and decision-makers to underestimate the value of EPH services, which can lead to budget and personnel cuts. Indeed, almost a quarter of EPH divisions cited a greater need for improved or enhanced education and outreach as well as management and evaluation tools to help further advance evidence-based EPH practice.

**Funding structure**

Funding for Maryland’s local EPH services comes from a mix of federal, state, and local funds, fees, and private grants. The mix of funding sources varies greatly among local jurisdictions. As shown in Figure 2,
19 percent of divisions received greater than 60 percent of their budget from fee-based services. Heavy reliance on fee-based service revenues raises concerns of whether economic forces, rather than public health needs, determine the prioritization and delivery of EPH services.

Each local health department determines how to utilize its state and county funds for EPH services. Some divide up their budgets for specific EPH services, while others receive funding through a local general fund that covers EPH service-related expenditures. While these arrangements often allow for financial flexibility, there may be insufficient funds dedicated to core EPH programs.

The past five years have brought significant change for local EPH budgets. For example, the majority of divisions (53%) experienced budget increases. However, these budget improvements can be largely attributed to increases in bioterrorism funding, which are generally earmarked for specific emergency response activities. Thus, this budgetary growth may not result in increases for core EPH programs or provide benefits for the EPH workforce.

Workforce

In Maryland, there are approximately 530 local EPH professionals. This enumeration includes registered environmental sanitarians (57%), professionals certified by the state to enforce and promote EPH laws and regulations, as well as supervisors and directors (16%), specialists (4%), and administrative personnel (23%). Specific challenges for the EPH workforce are outlined below.

Recruitment, retention, retirement

Staff recruitment is a challenge for local EPH divisions with barriers such as low starting salaries and little room for advancement. Staff retention is also difficult, as local divisions often serve as training grounds for sanitarians who leave to pursue higher paying positions in private industry or with other government agencies. Consequently, local EPH employees generally either stay with a division for the majority of their careers or are recent recruits. Recent recruits tend to have higher turnover rates than more senior personnel, and, although the loss of recent employees does reduce the division’s capacity, it is the loss of more senior staff, growing now because of retirements, that most severely reduces productivity. In 2003 alone, 25 percent of Maryland local EPH directors either retired or moved to other positions, and of these, only half had identified replacements at their time of departure.

Career advancement and compensation

The existence of a formalized EPH career path varies in local divisions and by county governmental structure. Consequently, the organizational structure of an EPH division is often a roadblock to career progression and contributes to staff retention problems. Opportunities for advancement within EPH ranks are limited, particularly in smaller divisions, until higher ranking staff members are promoted, retire, or move on. Fifty percent of EPH divisions do offer career tracks for practitioners that encourage professional and monetary advancements, although some questionnaire respondents indicated that salary increases are not directly linked to educational advancement.
In addition to the lack of clearly defined career paths, compensation is a major barrier to the development of a strong EPH workforce. As illustrated in Figure 3, at the entry level, sanitarians’ starting salaries are lower, have a narrower range of pay, and have far less competitive salary caps than other comparable government positions. When comparing educational requirements for these positions, sanitarian positions require a higher level of education than jobs with comparable compensation. This same pattern of lower pay continues through the supervisory levels.

Training

Despite the availability of training opportunities for EPH staff, challenges exist that limit their effectiveness. Eighty-five percent of EPH divisions have funds available for training, but from 2001 to 2003, fewer than 25 percent of counties actually utilized these funds. Reasons for this lack of use included difficulty in finding time away from hectic daily schedules and the inability to cover travel costs.

EPH practitioners also expressed frustration with the content of existing training opportunities, citing the reason that the subject matter being covered was either too general or too specific to be useful. For example, general training on indoor air quality issues is likely too broad for a sanitarian, while a course on how to speculate mold may be too specific to be of practical use. These training concerns mirror those raised by other national initiatives findings from the Seventh Report to the President and Congress on the Status of Health Personnel in the such as the United States finding that the environmental public health workforce suffers not only from limited training opportunities, but also from a lack of an established career path.7

These Maryland Profile workforce and training findings raise critical questions about whether Maryland has an adequate number of trained, front-line EPH professionals to address the pressing EPH issues outlined below.

Growth and development

In the last three decades, Maryland’s population increased by 37 percent, and the amount of land developed increased by 124 percent.8 The Maryland Department of Planning expects the state’s population to grow more than 20 percent by the year 2030.9 As expected, this dramatic increase in growth and development has significantly increased EPH division workloads, as EPH practitioners are responsible for activities such as reviewing and approving land plans, inspecting and approving septic system and well installations, and

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**FIGURE 3** Salaries and educational requirements for entry-level positions in local Maryland government jobs 2000–2002.

On the right Y-axis, 0 indicates no educational requirements; 1, high school or GED; 2, bachelor’s degree; 3 bachelor’s degree with advanced certification; and 4, master’s degree. From Maryland state on-line job listings posted between 2000 and 2002.
inspecting new and temporary food facilities. Local EPH divisions are also often responsible for signing off on new developments, as well as addressing environmental problems that arise after new neighborhoods have been built.

Additionally, since county growth rates are often determined by communities and their local elected officials, EPH practitioners reported political pressures to either reject or approve growth and development projects. These political pressures can make it difficult to focus solely on the public health consequences of growth and maintain professional standards as a sanitarian.

### Crisis management

The attacks on the Pentagon and World Trade Center in September of 2001 brought attention to the country’s inadequate emergency response capacity and provided an incentive to evaluate and enhance responsiveness. As a result of emergency preparedness funds, governmental agencies have developed working partnerships, reorganized divisions, hired staff, and purchased technology and equipment to help manage disasters. Local EPH divisions have accomplished much in the past three years, with each county in Maryland reporting increases in emergency response activities to events such as the 2002 drought, Hurricane Isabel, anthrax scares, and the emergence of West Nile Virus. In 2001–2003, local EPH divisions across the state spent approximately $1,607,368 and staff worked 31,038 hours (the equivalent of 15.5 full-time employees) to respond to these unexpected events.

### Natural disasters

In September 2003, Hurricane Isabel hit the state of Maryland. Its impact included accompanying EPH threats such as contaminated drinking water wells, sewage overflows, and flooded homes and food establishments. EPH personnel were directly engaged in inspecting restaurants, grocery stores, and other food establishments to ensure that damaged and potentially contaminated foods were properly disposed, testing drinking water wells for contamination, and managing sanitary sewage overflows. Beyond direct service requests, EPH practitioners were also involved in general response activities including staffing the disaster recovery centers and conducting public education and outreach activities.

### Terrorism/bioterrorism

Most EPH divisions received funding allocations over the past four years for the hiring of bioterrorism (BT) personnel and acquisition of related equipment. Nearly half the local EPH divisions in Maryland hired a BT coordinator for EPH response and training, while the remaining half share a BT coordinator with other health department divisions. In addition, 95 percent of EPH divisions reported cross-training their staff in multiple disciplines, such as food inspections and water sampling to allow for additional assistance in unexpected event response.

BT response is not consistently organized at the local level, and most EPH divisions responded that they have not received sufficient guidance from state and federal agencies on their roles and responsibilities. Local EPH divisions are often designated as first responders for various emergencies, despite the absence of defined roles and adequately trained personnel. Furthermore, during emergencies, EPH divisions are often tasked with duties outside the spectrum of traditional environmental health activities. For example, more than 60 percent of the EPH divisions reported being involved in the aftermath of the 2001 anthrax incidents. EPH divisions played a variety of roles in “white powder scares,” including tasks such as answering calls from concerned residents and transporting powder samples to laboratories. Despite involvement in these activities, respondents remained unsure of their emergency response roles and responsibilities.

Beyond the specific funding and personnel impacts, emergency response frequently requires EPH practitioners to delay the provision of core EPH services in times of crises, and continued response needs may result in sustained lapses in these core services, further risking the public’s health.

While nearly all counties experienced an increase in unexpected events during the past four years, respondents felt that surge capacity, the ability for an EPH division to shift resources to address an urgent crisis, was lacking at both the state and local levels. Insufficient financial and personnel support make it difficult for EPH practitioners to respond effectively and maintain regular services. In an emergency, when the support of neighboring counties is often vital for proper management, issues such as reimbursement, mismatched personnel systems that impede the quick transfer of employees, liability concerns, and a lack of insurance coverage for out-of-county sanitarians limit EPH divisions’ abilities to assist each other.

Effective and sustained communication among and between EPH professionals also proved to be an emergency response concern. Although several counties have established relationships with traditional emergency response divisions such as police and fire, many counties still cited poor coordination and conflicts between state and local agencies as barriers to
effective responses. State agencies have provided assistance in certain disaster situations, such as overseeing negotiations at Federal Emergency Management Agency (FEMA) meetings in the wake of Hurricane Isabel. However, these state agencies are hindered by many of the same limitations as local EPH divisions, with a lack of available personnel and limited funding for emergencies restricting their ability to more fully participate in local emergency response. This finding was corroborated in other parts of the nation by the deficiencies in the government’s response to Hurricane Katrina.
Technology

Maryland has made a number of technological strides over the past five years. The DHMH utilized emergency preparedness funds to create a statewide e-mail and intranet system, as well as to provide satellite downlink capabilities to each of Maryland’s 24 local jurisdictions. Furthermore, every local division has communication capabilities with field staff through either cell phones or two-way radios.

Individual counties are making considerable technological advances as well; some divisions are computerizing records, allowing them to be stored and accessed on-line, and others are exploring the use of handheld devices to enter information electronically from the field. It should be noted that these efforts are being initiated at the local level without full consideration of the possibilities of a statewide, coordinated effort. Nearly 20 percent of EPH divisions cited the need for enhancement in information technology and database connectivity services over the next five years. Furthermore, technological advances at the local level are often hindered because of lack of technical assistance and staff training. For example, some EPH divisions have used grant funding to purchase sophisticated technological equipment, but inadequate staffing and funding for upkeep and management after the grant period has ended has forced many divisions to leave equipment lying dormant.

Legal authority

In a field heavily dependent on regulatory activities such as inspections, permitting, and complaint investigation, access to qualified and dedicated legal support is critical. Fortunately, all jurisdictions in Maryland reported having access to legal materials such as codes and regulations, as well as access to county or state attorneys for advice. However, an overwhelming number of counties reported that attorney workloads hindered the legal assistance they received, and more than a quarter of EPH directors indicated that if funding was not limiting factor, they would add an attorney or legal help to their divisional staff.

Questionnaire respondents emphasized not only the need for new EPH laws, but also better enforcement of existing ones. In most jurisdictions, inspection and permitting responsibilities fall under the purview of local sanitarians, but some enforcement powers fall on state agencies such as MDE and DHMH. Unfortunately, because of state financial and personnel constraints, timely and thorough management of EPH violations is often lacking. As a result, local EPH practitioners with little or no legal expertise or legal muscle are relied upon to handle many violations, such as nuisance complaints.

Discussion

EPH practice depends on a strong infrastructure to ensure the safety of our nation’s food supply, water quality, and the health of our communities. While research for the Maryland Profile report revealed many strengths of Maryland’s EPH infrastructure, it also highlighted some critical limitations. Without incorporation of key components outlined in the recommendations in Figure 4, including effective organization, strong leadership, adequate financial resources, and a highly trained workforce, EPH divisions will continue to be hindered in their ability to deliver effective and efficient EPH services so as to better protect the public’s health.

The Maryland Profile report has led to a number of collaborations among DHMH, MDE, local health officers, local EH directors, and the JHU center to address the recommendations. Progress includes improvements in interagency communication through the revitalization of a state-local liaison committee and a reworking of the DHMH and MDE Memorandum of Understanding.

The state of the nation’s EPH infrastructure is only as strong as the local health capacity. These research findings and CDC’s capacity-building efforts to evaluate local EPH capacity on a national level are a critical first step toward addressing the nation’s fragile state of EPH practice and better protecting the nation’s health.

REFERENCES

