

California's County and City Environmental Health Services Delivery System

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Abstract

The purpose of the authors' research was to assess the current status of county and city environmental health service delivery in California with the aim of providing a foundation for informed decision making about environmental health service delivery. Standardized interviews were conducted from March 2005 to May 2005 with 55 (88 percent) of the 62 county and city directors of environmental health; their jurisdictions represented 90 percent of the state's population and 94 percent of the landmass. Relevant databases and other publicly available information germane to project goals were also evaluated. The directors who were interviewed reported a total of 2,477 professional environmental health staff employed in county and city agencies, complemented by 520 support personnel. Percentages of respondents reporting technical-training needs were greatest for Certified Unified Program Agency (CUPA) activities (60 percent), dairy programs (57 percent), and septic-system programs (55 percent), while nontechnical training was desired in conflict resolution (55 percent), written/oral communication (49 percent), and problem solving (49 percent). Sixty-seven percent (67 percent) of directors reported difficulty in recruiting qualified applicants. Fifty-six percent (56 percent) were familiar with the 10 essential services of environmental health, while only 11 percent collected and reported health outcome measures to demonstrate agency effectiveness. The study team concluded that at the local level, environmental health services are largely provided as a reflection of local need; however, this tendency toward customization leads to stakeholder confusion about the purpose and value of environmental health services. The authors offer seven recommendations for improving environmental health services in California. Many of these recommendations can be generalized to the nation at large.

Introduction

To enhance understanding of environmental health service provision in California, the Loma Linda University School of Public Health conducted an environmental health

services delivery assessment of California's county and city health agencies from March 2005 to May 2005. The investigation included a workforce enumeration, an evaluation of training needs, an assessment of knowledge

and practice regarding the 10 essential services of environmental health (Osaki, 2004), and examination of trends in emergency response. The roles of federal and state agencies and Native American and tribal territories were beyond the scope of this project.

The need for an assessment of the structure, size, and capacities of state, local, and tribal environmental health agencies has been described by the U.S. Centers for Disease Control and Prevention's (CDC's) *A National Strategy to Revitalize Environmental Health Services* (CDC, 2003). This document established that a revitalization of environmental health services is urgently needed and presented the following seven generalizations about environmental health, in part to support this argument:

1. There is an insufficient number of practitioners and properly trained environmental public health specialists.
2. In the public sector, environmental public health personnel are underpaid by comparison with their counterparts in the private sector, a situation that leads to many vacant positions and high turnover rates.
3. Service delivery techniques often are outdated. Many employees in the environmental public health workforce do not fully benefit from available technology and information management.
4. The essential-public-health-services concept and a health-outcomes-analysis approach have had minimal effect on environmental public health practice and the delivery of environmental public health services.

5. Substandard residential housing, school buildings, and daycare facilities pose potential risks to health and have received little attention from environmental health programs.
6. The demand for expanded environmental public health services and new and emerging threats is diluting service delivery.
7. More stakeholders need to be engaged in the process of delivering environmental public health services at the community level.

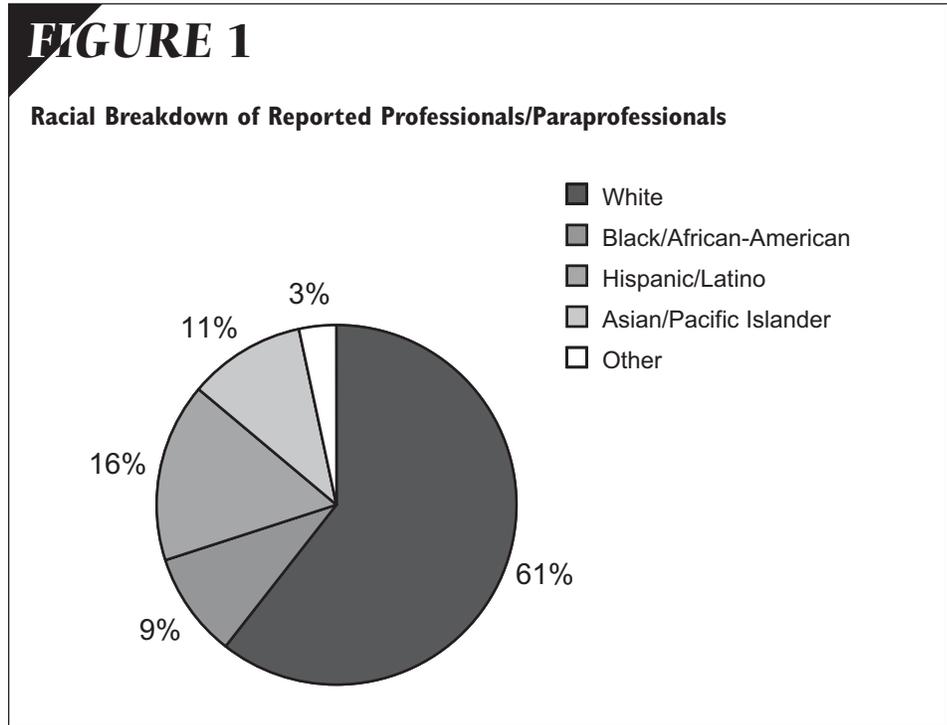
The authors of CDC's *National Strategy to Revitalize Environmental Health Services* suggested that addressing these generalizations through innovative programs will lead to enhanced environmental health services (CDC, 2003). The proposed plan comprised six main goals: build capacity, support research, foster leadership, communicate and market, develop the workforce, and create strategic partnerships.

The study reported here builds on the foundation established by CDC's *National Strategy* document. The aim was to characterize environmental health conditions in California and to use the findings as a tool to identify opportunities to enhance service delivery capacity.

Methods

The assessment was developed in two phases. Phase I included a literature search to identify existing surveys utilized for similar assessments. The *Profile of Maryland Environmental Public Health Practice* (Johns Hopkins Center for Excellence in Community Environmental Health Practice, 2005) was the primary instrument reviewed, and it provided a foundation for the authors' efforts. After markup and modification, the resulting instrument contained 19 environmental health programmatic-review areas. The draft instrument was subsequently submitted to CDC and key personnel at the California Conference of Directors of Environmental Health (CCDEH) for review and comment.

Phase II involved incorporating the suggested modifications and adjustments, including explicit insertion of the 10 essential services of environmental health. Six more areas of environmental health service delivery were added to the original 19, resulting in a total of 25 program areas. The final instrument assessed 25 pertinent media and program areas, through which the majority of local environmental health services are delivered: outdoor air, indoor air, drinking water, local primacy agency, water wells, wastewater, hazardous materials/emergency response,



household hazardous waste, Certified Unified Program Agency (CUPA), Superfund sites, solid waste, medical waste, liquid waste, biosolids, food, recreational health, animal control, vector control, radiation health, noise pollution, housing, land use, occupational health, pesticide regulation, and dairy.

In addition to identifying areas in which environmental health services were provided, the environmental health directors reported on the number of environmental health professionals working in the field, whether funding was adequate to effectively provide service in a given area, whether services in that area had been reduced/eliminated or enhanced/added in the past five years, and whether technical training was needed or desired.

The survey contained sections assessing worker profiles, including number and type of environmental health workers, their race/ethnicity, age, minimum level of training required versus the level preferred, and the number of vacant and frozen openings. Training needs in technical areas were also assessed, as were training needs for the core competencies as delineated by CDC's *Environmental Health Competency Project: Recommendations for Core Competencies for Local Environmental Health Practitioners* (American Public Health Association [APHA] & CDC, 2001), were also assessed. Other areas evaluated include trends in staff longevity and retention and trends in emergency response.

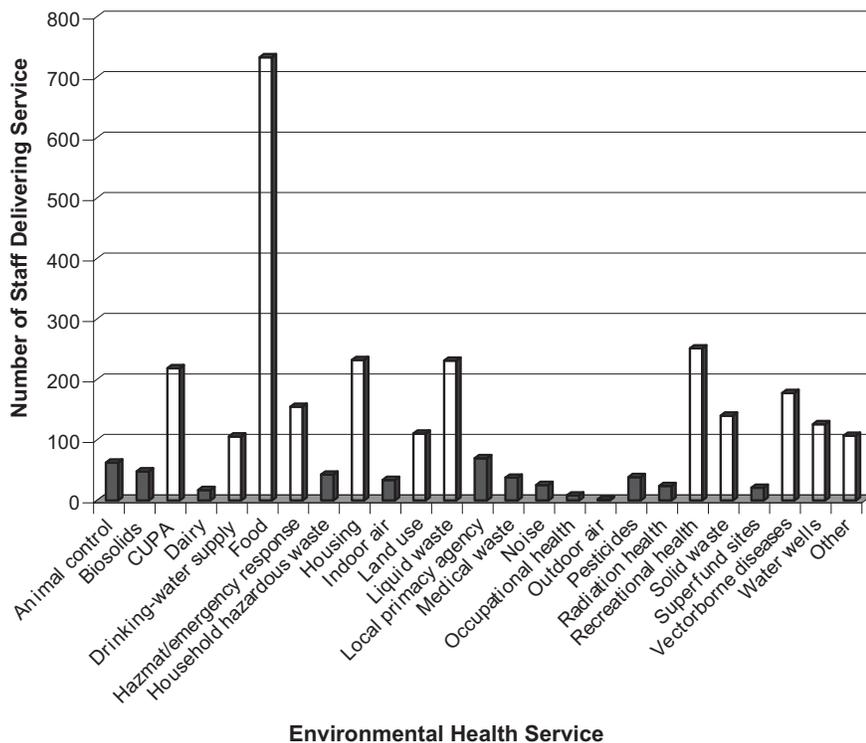
Six open-ended questions were also included in the survey to allow for information to be presented without the imposition of predetermined responses. These questions concerned barriers and enabling mechanisms in the response to emergencies, methodologies for measuring success, descriptions of departmental best practices, and key needs and barriers that must be addressed to enhance environmental health service delivery. Unsolicited comments made by the interviewees were transcribed and, wherever appropriate, were included in the results and discussion sections to provide context.

The final survey instrument was submitted to Loma Linda University's Institutional Review Board (LLU-IRB), which determined that the proposed data collection and analysis procedures did not involve the use of human subjects as defined in federal regulations (Protection of Human Subjects Rule, 2005).

All 62 environmental health directors in the state were invited to participate in the survey. The CCDEH president distributed the assessment instrument via e-mail to all conference members with an attached letter articulating the projects' scope and purpose. The e-mail explained that the environmental health officers would be receiving a phone call to schedule an appointment to conduct the survey by phone. In sum, 55 counties/cities (88.7 percent) participated in the survey. A total of 48 phone interviews were conducted: 45 with environmental health

FIGURE 2

Total Professional/Paraprofessional Count for All Counties



directors and 3 with personnel appointed by an environmental health director. Two directors provided information for more than one county (this doubling occurred with contract counties only). Four surveys were submitted via mail, fax, or e-mail without completion of a phone interview. Seven environmental health directors (six county directors and one city director) elected to not participate. The seven nonparticipating jurisdictions represent approximately 5.6 percent of the California's land mass area and roughly 10 percent of the population.

All interviews were conducted between March 15 and May 17, 2005. The surveys were administered as telephone interviews with the environmental health director or a designee (although 94 percent of the interviews were given by directors) and lasted from 30 to 60 minutes. The length of the interviews depended on the length of the responses given by the directors and on their prior preparation for the survey. All phone interviews were conducted by one research associate to ensure consistent survey administration. Questions were read exactly as they appeared on the survey, and elabora-

tions in any area were provided only if the interviewee asked for clarification.

To ensure consistent survey administration, the research associate answered questions about the 10 essential services of environmental health by referring the respondent to *Local Public Health System Performance Standards: National Public Health Performance Standards Program* (CDC, n.d.). The research associate answered questions about training in the core competencies by referring the respondent to CDC's *Environmental Health Competency Project: Recommendations for Core Competencies for Local Environmental Health Practitioners* (APHA & CDC, 2001).

Results

California has a centralized-decentralized control mechanism, under which local environmental health services may be provided by state agencies, local health departments, and, in some cases, a mixture of both (Health Resources and Services Administration, [HRSA], 2000). Key state agencies that oversee the delivery of environmental health services are the California Environ-

mental Protection Agency (Cal/EPA) and the California Department of Health Services (CDHS). California has a total of 62 local providers of environmental health services. These providers include environmental health departments, divisions, and service programs in 58 county and four city jurisdictions. Because of their small population size (<50,000 people), 10 rural counties contract with CDHS to develop and support environmental health programs and services (Office of County Health Services, 2003). These counties are provided with state-employed environmental specialists, but several also employ county-registered environmental health specialists (REHSs). Each of the 10 counties employs a health officer and support staff. Contract and noncontract counties are responsible for providing the services that their respective board of supervisors and county administrators assign.

In addition to receiving services from county and city service providers, California citizens benefit from the efforts of personnel associated with the state's 35 air quality management districts, 21 water quality management districts, 55 county agricultural commissioners, and 23 Occupational Safety and Health Administration (Cal/OSHA) enforcement districts.

Demographic Breakdown of Workforce

Demographic information was collected for environmental health professional and paraprofessional staff only. While gender information was comparatively accurate, many directors gave approximate answers about the ethnic origin and age of their staff. More than half of professionals and paraprofessionals (55 percent) were male. As indicated in Figure 1, a majority (61 percent) of those employed as professionals or paraprofessionals in environmental health departments were identified as Caucasian (white). The next two largest groups were Hispanic/Latino (16 percent) and Asian/Pacific Islander (11 percent). The majority of professional staff (97 percent) were either 25–44 years of age (52 percent) or 45–64 years of age (45 percent).

Workforce Breakdown by Service Area

Figure 2 presents a breakdown of the total number of professionals and paraprofessionals that were reported per service area. The number of professionals and paraprofessionals providing services in food quality (733) is substantially higher than the number in

all other programs, and constitutes almost 25 percent of the total reported workforce. Recreational health has the second highest number of reported employees (252), followed by housing (232) and liquid waste (231). The programs that employ the most professionals appear to be substantially or completely fee supported.

Service Delivery Challenges

Directors were asked about major challenges faced by their department with respect to the workforce and the filling of vacancies. Table 1 summarizes their responses. The challenge most frequently reported was a lack of adequately qualified applicants. A majority of directors explained that there were currently not enough qualified applicants to fill vacant posts and that recruiting REHSs was a difficult process. More than half of the respondents also reported that compensation and retention were challenges. It was noted throughout the interview process that compensation and retention are linked.

Training Needs

Technical Training

In each category of service delivery, at least 25 percent of the respondents who provided a particular service noted a need for staff training. The area in which the need for training was the highest was the Certified Unified Primacy Agency (CUPA) program (60 percent), followed by dairy (57 percent) and liquid waste programs (55 percent).

Nontechnical Training

The survey assessed the need for training in core competency areas as delineated in the *Environmental Health Competency Project* of CDC's National Center for Environmental Health (APHA & CDC, 2001). Table 2 summarizes the training needs as reported. Training needs were greatest in the areas of written/oral communication, conflict resolution, problem solving, and project management. A majority of participants identified face-to-face training as the preferred delivery method (69 percent), followed by Web-based (31 percent) and satellite (13 percent) communication. Several directors explained that while face-to-face training was preferred, it was difficult to access from their remote location and often required expensive and time-consuming trips to major metropolitan areas.

TABLE 1

Percentages of Respondents Who Reported That Their Departments Were Facing Various Major Challenges

Challenge	Percentage of Respondents Facing Challenge (n)
Lack of adequately qualified applicants	67 (37)
Applicants lack relevant experience	35 (19)
Retention	52 (29)
Compensation	58 (32)
Competition	35 (19)
Other	27 (15)

TABLE 2

Communication and Management Training Needs

Potential Areas of Need for Additional Training	Percentage of Respondents Indicating Need (n)
Communication	
1. Health education	31 (17)
2. Written/oral	49 (27)
3. Conflict resolution	55 (30)
Management	
4. Problem solving	49 (27)
5. Organizational knowledge & behavior	27 (15)
6. Project management	47 (26)
7. Computers & IT	38 (21)
8. Reporting/record keeping	40 (22)
9. Collaboration	36 (20)

Enhancing Environmental Health Service Delivery—Key Needs and Challenges

Environmental health directors' thoughts on the key needs and challenges associated with enhancing environmental health service delivery are presented in Table 3. Forty percent of environmental health directors identified a need for increased resources to enhance or better provide environmental health services. The next most frequent responses were the need for increased advocacy for the environmental health profession (31 percent), training (18 percent), and securing a source of funding that would not be fee-related (13 percent). Environmental health directors noted that increases in non-categorical, general-fund, and grant money are needed to provide more flexibility in the programs and services that could be offered by the department. Several directors indicated that funds

are necessary for research and to augment the expanding scope of certain mandated programs, since fee-generated funds cannot be used for these purposes.

Significant barriers to improving environmental health service delivery were also examined. The most frequently reported barriers to improvement of environmental health services are presented in Table 4. Fifty-six percent of respondents identified lack of resources as a main barrier to improvement of environmental health services. Poor marketing of environmental health profession was identified as a main barrier by 33 percent of respondents. Sixteen percent of respondents reported pipeline issues (i.e., lack of qualified applicants) or lack of political support for the environmental health profession as main barriers to improving environmental health services.

TABLE 3**Key Needs for Enhancement of Environmental Health Services, as Identified by Environmental Health Directors**

Need	Percentage of Directors Indicating the Need (n)
Resources—funding and staffing	40 (22)
Increased advocacy/understanding of the profession	31 (17)
Training, funding for training	18 (10)
Funding not generated by fees	13 (7)

TABLE 4**Most Significant Barriers to Improving Environmental Health Services**

Barrier	Percentage of Respondents Indicating Presence of Barrier (n)
Resources—funding and staffing	56 (31)
Poor marketing of the profession	33 (18)
Pipeline: lack of qualified personnel	16 (9)
Lack of political support for the profession	16 (9)

Essential Services

When asked if they were familiar with the 10 essential services of environmental health, 56 percent ($n = 31$) of respondents agreed and 42 percent ($n = 23$) disagreed. Table 5 presents results for each of the 10 essential services. It is interesting that while 42 percent of directors were not familiar with the essential services nomenclature, a majority indicated that most of those services were provided “routinely” or “sometimes” by their department.

Measuring Success

Table 6 gives the measures of success used by the survey participants. The majority (62 percent) reported use of process measures, while 27 percent reported assessing customer satisfaction and 13 percent identified continued political support or an absence of conflicts with the local board of supervisors as a measure of success. Reports generated by the Envision database, rate of compliance (the number of customers who corrected violations), and unspecified “outcome measurements” were each reported as success measures by 11 percent of respondents. Five percent indicated that the departmental measure of success was

the absence of problems, and two respondents (4 percent) stated that no formal methods were currently in place to measure or monitor success.

Best Practices

Table 7 presents the major findings of an open-ended question centered on best practices. Respondents reported best practices either as departmental attributes or as specific programs. Some directors reported more than one area in which they felt their department excelled. Eighteen different programs were identified by environmental health directors as departmental best practices. Generally, directors identified programs as best practices if the program functioned with particular efficacy, received consumer compliments, employed innovative methodologies or technologies, or made unique contributions to environmental health. For nonservices-related best practices, directors reported departmental strengths relating to fostering relationships with the public and with other agencies: Good relations with the public, amiable staff, provision of public education, and collaboration constituted a majority of the responses.

Discussion and Recommendations**Diversified Environmental Health System**

At the local level, California possesses a diversified environmental health services delivery system that reflects public and political demand for effective and visible environmental health services. At the same time, some view the system as fragmented, as illustrated by vertically aligned service delivery with limited integration among agencies. Proponents of the latter view point to California’s 62 environmental health departments, 35 air quality management districts, 21 water quality management districts, 55 county agricultural commissioners, and 23 Cal/OSHA enforcement districts as evidence for their contention. These entities oversee separate and sometimes overlapping environmental health areas, and, with few exceptions, they work independently from each other, creating uncertainty among environmental health professionals and their customers about which agency is providing which service.

This trend continues in local environmental health departments, where a standard framework for service delivery is absent. Counties and cities reported delivering anywhere from 8 to 19 services, with retail food facility inspections being the one service provided by every environmental health office. The research team observed a lack of a standard set of services coupled with inconsistent use of environmental health service delivery terminology.

While it is understandable that different jurisdictions provide services differently, this lack of cohesiveness can contribute to confusion within the profession as well as among those not familiar with the environmental health field. Consumers and politicians can become cautious about supporting environmental health departments when they do not understand the range of services or what these services actually involve. This situation results in a continuous cycle in which lack of understanding for the profession results in lack of support, which translates into reduced or limited resources. To break the cycle, marketing of the field must begin with a clear and consistent definition of what environmental health is, what its role in public health is, and the value it represents.

Recommendation #1

The authors recommend standardization of environmental health terms and definitions to enhance communication among environmental health entities and with those outside the profession.

TABLE 5a**Frequency with Which Respondents Reported Providing the 10 Essential Services of Environmental Health***

Essential Service	Percentage of Respondents Indicating Frequency with Which the Service Is Provided		
	Routinely	Sometimes	Never
1. Monitor environmental and health status to identify community environmental health problems	20	69	11
2. Diagnose and investigate environmental health problems and health hazards in the community	67	31	2
3. Inform, educate, and empower people about environmental health issues	76	24	0
4. Mobilize community partnerships to identify and solve environmental health problems	26	64	11
5. Develop policies and plans that support individual and community environmental health efforts	36	60	4
6. Enforce laws and regulations that protect health and ensure safety	100	0	0
7. Link people to needed environmental health services and assure the provision of environmental health services when otherwise unavailable	58	42	0
9. Evaluate effectiveness, accessibility, and quality of personal- and population-based environmental health services	36	51	13
10. Conduct research for new insights and innovative solutions to environmental health problems and issues	11	67	22

*See Table 5b for information on Essential Service Question 8.

Best Practices

Because the environmental health field is highly technical, professionals in this field have generally suffered from a reputation of not being “people friendly.” The authors’ survey, however, found that many respondents pride themselves on their department’s relationship with the public. In fact, the three most-reported nonservices best practices involved internal and external relationships connected with customer service or education. Unfortunately, a system that encourages sharing of best practices within California does not currently exist.

Recommendation #2

The authors recommend that California develop an intercounty system for sharing of best practices.

Measures of Success

The majority (62 percent) of interviewed environmental health directors conveyed the use of process measures (e.g., number of inspections scheduled versus number completed) as the cornerstone of their success-reporting system. The absence of measures that demonstrate public health value (e.g., reduction in foodborne illnesses over time translated

into health care cost savings) is problematic, as accountability and return on investment principles appear to be gaining momentum at the federal level. A step toward addressing this matter would be reporting successes in environmental health in a manner that communicates the field’s significance. By adopting measurable outcome measures, environmental health departments could communicate the value of environmental health in a much more effective fashion. The authors’ study found that most environmental health departments utilized process measures to assess success; only 11 percent measured outcomes of any type. Integrating measurable health impact components into current programs is vital to the future of the profession.

Recommendation #3

The authors recommend that the environmental health profession, perhaps spearheaded by NEHA, develop, collect, and catalog customer-focused outcomes and performance measures that demonstrate the health and financial benefits of environmental health services.

Integration of Services

Key stakeholders throughout the nation are calling for a shift in environmental health

service delivery from traditional services that focus on the relationship between agents and disease to more comprehensive programs that take into account local environments and communities and how these conditions affect the public’s health. To accomplish this, stakeholders have suggested integrating the 10 essential services of environmental health into routine practice.

The study reported here evaluated each environmental health director’s familiarity with the 10 essential services. Forty-two percent of respondents indicated that they were not familiar with the essential services. The authors also found that while a large percentage of environmental health directors lack familiarity with the terminology “Essential Services,” many nonetheless reported providing many of the essential services. Although some departments are attempting to shift to a more integrated service delivery approach, the authors’ data suggest that in California the principle emphasis of environmental health remains provision of fee-generating, traditional, stovepipe services. All respondents (100 percent) indicated providing Essential Service Six (enforce laws and regulation that protect health and ensure safety) “routinely.”

TABLE 5b**Percentage of Respondents Who Reported Activities Undertaken to Assure a Competent Environmental Health Workforce According to Essential Service 8**

Activity Undertaken in Support of Essential Service 8— Assure a Competent Environmental Health Workforce	Percentage Who Responded Yes
a. Establishing workforce standards	75
b. Continuing education	64
c. Training	96
d. Other	13

TABLE 6**Measures of Success Used by Environmental Health Directors**

Measure	Percentage of Respondents Using the Measure (n)
Process	62 (34)
Customer service (lack of complaints)	27 (15)
Surveys	13 (7)
Political support and conflicts	13 (7)
Reports by Envision database	11 (6)
Rate of compliance	11 (6)
Outcomes	11 (6)
Absence of problems	5 (3)
Currently do not have a way to measure success	4 (2)

On the other hand, 22 percent reported that they “never” provide Essential Service Ten (conduct research for new insights and innovative solutions to environmental health problems) (Osaki, 2004). One factor that contributes to this pattern is the fee-based structure of California environmental health service delivery.

As environmental health departments become progressively more fee-supported, service delivery is being limited to providing permits and enforcing regulations. Thus, while several directors reported an interest in conducting research and launching innovative programs, their ability to do so is dictated by their reliance on a fee-for-service structure. The most reported key need for providing services is increased resources (40 percent), and, conversely, the most reported barrier is lack of resources (56 percent). Environmental health directors reported that securing non-fee-generated funding is a key need for enhancement of environmental health services (Table 3).

Recommendation #4

The authors recommend that the California legislature increase funding to support non-fee-based activities. Increasing general-fund support will maximize service provision flexibility and the option to support applied research, community outreach, and the provision of comprehensive services, with the ultimate aim of integrating these services to maximize the health benefits for all Californians.

Training

Over half of the environmental health directors reported having training needs with respect to CUPA (a hazardous materials management-related area), dairy, and septic systems, while approximately the same percentage noted that additional training would be ideal in the areas of written/oral communication, problem solving, project management, and conflict resolution. While California manages its own environmental health professional certification system (Registered Environmental Health Specialist, or REHS),

it does not require continuing professional education to maintain professional status.

The directors articulated a preference for face-to-face training over other delivery vehicles. It is not clear how these preferences can be met in light of the state’s mammoth geography and the abundant number of counties located great distances from major metropolitan areas. Perhaps a combination of distance-learning and face-to-face options should be considered.

Recommendation #5

The authors recommend that CCDEH consider the development of a statewide strategy to provide training in priority areas such as written/oral communication, problem solving, project management, and conflict resolution. An overall learning-management system may provide the backbone for a statewide approach to training in these areas as well as in other service areas. CDHS should develop and implement a continuing-professional-education requirement for all REHSs.

Marketing the Environmental Health Profession

An identified barrier to enhancing environmental health services is the lack of marketing of the environmental health profession. As previously noted, 31 percent of environmental health directors reported that increased advocacy and marketing of the profession is essential to enhancing environmental health service delivery. Similarly, 33 percent stated that poor marketing of the profession is a barrier to improving service delivery. Directors differ in their opinions about who is principally responsible for marketing environmental health, and specific responses identified the state, academia, or environmental health departments as parties that should provide leadership in raising awareness about the profession.

Directors noted several reasons for the need for additional marketing. One was that environmental health is an invisible profession, a circumstance that leads to reduced funding and a dwindling REHS pipeline. Also, several directors indicated that environmental health lacks political status, which results in funds being diverted to other areas that are perceived as more important.

Because limited knowledge in the general population about the environmental health field is limited, few people appear to be choosing environmental health as a career track. Data from the authors’ study show that nearly half of the workforce is

mid-career or older. Sixty-seven percent of environmental health directors reported that finding adequately qualified applicants is a major concern. With an aging workforce and a lack of qualified applicants, particularly among Hispanics and African-Americans, environmental health directors are concerned about the future of the profession; many insist that promoting the environmental health field is essential to addressing these challenging issues.

Last, directors reported difficulty in gaining support because the profession is based on prevention. They expressed frustration about communicating to decision makers that they are effectively executing their duties. CDC presented the same issue in its *National Strategy to Revitalize Environmental Public Health Services*:

A successful environmental public health program becomes invisible. If environmental public health is done right, nobody takes notice. As a result, it's hard to gain support for more resources. The public only know you're there when you are not doing your job well. When things are going well, policy makers think: "Well they don't need all that money, there are no public health problems there." If the budget is cut, then the public health problems result (CDC, 2003, p. 24).

Recommendation #6

The authors recommend that a national environmental health marketing strategy be developed and implemented to promote the profession, its services, the value it provides, and career opportunities, with an emphasis on recruiting underrepresented minorities. Such a strategy would require the articulation of core customers, priority issues, appropriate messaging, and communication vehicles, among others.

Pipeline Issues

California's environmental health workforce can be characterized as aging, and it lacks the racial diversity of California at large. In the authors' survey, environmental health direc-

TABLE 7

Self-Reported Departmental Best-Practices Attributes and Programs

Best-Practices Attribute or Program	Percentage of Respondents Reporting Attribute or Program (n)
Collaboration	5 (3)
CUPA	5 (3)
Food program	13 (7)
Good customer service/relations with public	35 (19)
Good staff	16 (9)
Liquid waste/septics	11 (6)
Public education	11 (6)
Training	5 (3)
Water quality program	7 (4)

tors reported that the new-employee pipeline is inadequate to meet the existing and emerging needs for professional staff. Some within the state believe that the issue is one of compensation (providing a living wage relative to cost of living), not an issue of qualified applicants. Informally, several environmental health directors revealed that many entry-level employees must commute considerable distances to secure affordable housing.

Recommendation #7

The authors recommend that CCDEH and CDHS reconcile the perception of an inadequate labor pool and consider efforts to recruit applicants who reflect the racial diversity of California's population. Efforts to increase compensation for environmental health professionals should be considered in light of California's cost of living.

Conclusions

The study reported here reveals that California possesses a complex network of environmental health service providers. Although not problematic in itself, this situation leads to stakeholder confusion about service delivery and return on investment for environ-

mental health infrastructure. The environmental health profession would benefit from a cogent nationwide effort aimed at identifying and communicating health and financial outcomes associated with its prevention efforts. Support for increased compensation, training, research, and workforce recruitment may be enhanced by clear and consistent articulation of benefits associated with effective environmental health services. 

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—Robert Powitz, Ph.D. MPH
Feb/Mar 2006 Food Safety Magazine

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