Local Health Department Capacity and Performance in New Jersey

Clifford G. Freund and Zhiyuan Liu

The Institute of Medicine's report in 1988 has spawned numerous efforts to strengthen the nation's public health system. Performance monitoring and public health practice standards have received considerable attention. All local health departments were surveyed in New Jersey to assess performance of core functions, 10 organizational practices, and organizational capacity in terms of staffing, communications, and computer capabilities. Overall, core function performance was measured at 59.7 percent and four organizational practices were measured at less than 50 percent performed. Information from this study will help direct efforts to strengthen New Jersey's public health system.

Key words: *capacity, core functions, local health department, organizational practices, performance assessment, practice standards*

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Introduction

In 1988, the Institute of Medicine (IOM) issued its landmark report on *The Future of Public Health*. This report called attention to a fragile public health system, which if allowed to fall in disarray, portended serious threats to the health and well-being of the American public.[1,2] During the past decade, a national movement to strengthen the public health infrastructure has been undertaken in response to this call for action. Rapid changes in the health care environment and an appreciation of the value of population-based preventive services have prompted several states to examine and strengthen their public health systems.[3–7]

Because most direct public health services are delivered through the local health department (LHD), numerous studies on public health practice performance[8–13] and quality assurance processes[14–20] have been focused at this level of governmental health agencies. As the rigors of scientific inquiry are applied to the practice of public health, more effective operational and organizational research and evaluation tools are becoming available. These tools are important in the development of appropriate public health policy at a state level. Performance standards

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for capacity and public health practice that are being developed at the national level will be a welcome tool in helping state and local governments improve their public health systems.[21]

In the state of New Jersey, municipalities exercise considerable political force in self-determination for police, fire, and other governmental services including public health. Since 1887, all municipalities have been required to have a local board of health (LBOH).[22] Surveys have estimated that at least 524 LBOHs are operating within the state.[23] State laws also allow for 12 different forms of local governance that influence the type and function of boards of health. Boards range dramatically in size, composition, and expertise and can exercise strong control as an autonomous body or can function simply in an advisory role. Boards of health deliver public health services either through their own municipal health departments or they may contract for these services with other municipalities, regional health commissions, or county health departments where they exist. At this time, New Jersey's boards of health provide public health services through 115 different health departments.

New Jersey ranks first in the nation in population density, is the second most urbanized state, and is the only state to have all of its counties officially classified as metropolitan by the federal government. In spite of an estimated population in excess of 8 million, the state's largest city, Newark, had a population of only 258,751 in 1994. In fact, only four of New Jersey's cities exceed 100,000 population. The state therefore is characterized by numerous small and mid-size communities containing populations of less than 100,000.

The Local Health Services Act of 1975 requires each LBOH to retain the services of a full-time, state-licensed health officer.[24] This act facilitated the consolidation of the number of LHDs from 291 in 1974 to 115 in 1998 and requires each LBOH to meet minimum standards of performance for the provision of public health services.

More than $184 million was budgeted for local public health services in 1997.[25] Most of the funds came from local tax and other revenues (78%) while the remaining funds came from state and federal sources (22%). LHDs increasingly have found themselves in competition with each other for the provision of traditional public health protection services as municipal governments seek to mitigate the local tax burden through cheaper services. In addition, a significant number of public health services are provided by hospitals, home health agencies, visiting nurse agencies, community health centers, family planning agencies, drug and alcohol councils, and regional Maternal and Child Health (MCH) consortia. Largely, these providers operate with little or no involvement of the local governmental public health department in planning, service coordination, or quality assurance. The call to improve the nation's public health system and other health care system changes driven by cost containment are redefining the role and accountability of the local public health department.

The Public Health Council is a state-level policy board created by statute to enforce the state's sanitary code, regulate LBOH services and performance, and monitor state health department activities.[26,27] Performance standards for LBOHs in New Jersey have not been changed since 1986. Consequently, the Public Health Council has enjoined the New Jersey Department of Health and Senior Services (DHSS) to develop performance standards that reflect more current thinking on the practice of public health.

In 1995, the New Jersey DHHS initiated two important projects to improve its local public health system. One project was the building of New Jersey's Local Information and Communications System (NJ LINCS), which connected 24 LHDs (one in each county and one in the three largest cities) with DHSS through the Internet. The second project was the aforementioned assignment to rewrite public health practice standards. In the process of developing more modern public health practice standards for New Jersey, it became obvious that there were no data on which effective public health system improvement planning could be based. Consequently, this study was initiated in July 1998 to provide a baseline measure of public health system capacity and core function performance. These data then could be used to target public health policy to those areas of greatest need.

Methods

With the input and support of the New Jersey Health Officer's Association, a five-part survey questionnaire was designed and mailed to 115 LHDs in

July 1998. Responses were received through September 1998. The questionnaire solicited responses in five categories: (1) Structure, (2) Core Function Performance, (3) Personnel Resources, (4) Communications Capabilities, and (5) Public Health Activities. The questionnaire was designed to facilitate participation in the study by asking yes/no or multiple choice questions wherever possible.

Data are reported for 102 of New Jersey's 115 LHDs, resulting in a response rate of 88.7 percent. Completed questionnaires were compared with existing data known for organizational structure and population size to evaluate the representativeness of the data. Health departments serving a population size of 50,000–100,000 (which account for 25% of all LHDs) appear to be underrepresented in the study sample because only 20 (69%) of 26 completed the survey. The reason for this is not known. In all other categories, the study data match the known data very closely.

The first section of the survey required each health department to indicate the type of organizational structure that best described its agency (county, municipal, regional, or contractual). Contractual health departments are defined as municipal health departments that provide services to more than one municipality, usually by inter-local agreement or contract. Regional health departments have jurisdictions similar to those of large contractual health departments (i.e., several municipalities) but they are governed by a regional health commission rather than contracted for services by independent municipal boards of health. Regional health departments are not likely to change jurisdictional areas from year to year. The same is not true for contractual health departments, where jurisdictions for public health service delivery may vary annually due to municipal governments seeking services at the least cost. Next, health departments were asked to indicate the size of the population they served (< 25,000, 25–50,000, 50–100,000, 100–250,000 or > 250,000). Finally, each was asked to indicate the response that best described their agency's annual operating budget (< $100,000, $100–500,000, $500–1 million, $1–3 million, $3–5 million, $5–10 million, or > $10 million).

The second section consisted of 26 yes/no questions developed by Miller et al.[8,9] related to the performance of core functions and 10 public health practices. The 26 indicators used to evaluate core function performance included 8 questions related to assessment, 10 questions related to policy development, and 8 questions related to the assurance function. The same 26 questions broken down in the following manner were used to evaluate the 10 organizational practices of public health: (1) three for assess, (2) three for investigate, (3) two for analyze, (4) four for advocate, (5) three for set priorities, (6) three for develop plans, (7) two for manage, (8) two for implement, (9) two for evaluate, and (10) two for inform/educate. The two possible responses were 'yes' or 'no.' Percentage scores were computed by the frequency of 'yes' answers divided by the total number of answers in a given category.

The third section provided a list of 19 possible health department job titles and asked for the number of full-time equivalent (FTE) staff employed in each title. The fourth section consisted of yes/no answers to questions related to the computer and communications capabilities of the agency. The final section consisted of 35 activities that may be performed by LHDs. Respondents were asked to indicate which activities their organizations performed and also to indicate a response which best indicated what level of effort was extended by the organization in performing each activity (1 = lowest, 2 = low, 3 = moderate, 4 = above average, and 5 = highest).

All returned questionnaires were reviewed for completeness and follow-up telephone calls were made where critical information either was missing or illogical. Data were entered into a computerized database (Microsoft Access 7.0) and were analyzed using SAS statistical software.[28]

Results

Description of local health infrastructure

The organizational structure of New Jersey's LHDs are overwhelmingly either municipal (45.2%) or contractual (37.4%). However, county health departments, despite their limited number (n = 14, 12.2%), serve more (40.2%) of the state's population than any other single group. Not surprisingly, most health departments (87.9%) serve populations of less than 100,000 and about one fourth (27.0%) serve populations of less than 25,000. More than half (56.8%) of the LHDs operate on an annual budget of less than $500,000 and almost three fourths (73.5%) operate on annual budgets of less than $1 million.

Personnel resources employed by LHDs vary tremendously. County health departments are the largest employers of local public health staff, followed by regional health departments. Municipal and contractual health departments employ similar numbers of staff. By using the mean number of FTEs for each organizational structure and assigning that number to the respective health departments that did not report data, we estimate the total number of LHD employees to be 2,485.6 or 30.9 FTEs per 100,000 population based on New Jersey's 1997 estimated population of 8,052,849. When adjusted for population across the 102 jurisdictions included in the study, the number of FTEs per 100,000 population ranged from 6.6 to 186.8, with a median of 29.9. Staffing rates were remarkably similar despite organizational structure, population size served, or annual budget size (see Table 1). Public health nurses (20.5%), secretaries (16.8%), and registered environmental health specialists (14.7%) were the predominant types of staff employed by LHDs (see Table 2). County or regional health departments serving larger population bases typically had larger budgets and more personnel to carry out public health mandates.

Virtually all (99.0%) of the LHDs reported having a Pentium class personal computer (PC) of sufficient size to handle the requirements of modern information systems and two thirds (66.6%) reported having access to the Internet. A vast majority (82.4%) of LHDs provides their staff with beepers and more than one third (39.2%) provide cellular/digital telephones for rapid communications. Approximately one fifth (20.6%) reported the capability to conduct teleconferencing. As expected, communications capabilities increased with larger numbers of staff employed, greater sizes of populations served, and larger budgets.

Table 1

Full-time equivalent (FTE) personnel, local health departments in New Jersey, 1998

		Total FTE		FTE/100,000 population	
Factor	**Number**	**Median**	**Range**	**Median**	**Range**
Structure					
Municipal	47	8.0	1.0–90.0	30.2	6.6–68.9
Contractual[1]	37	8.4	4.7–69.0	26.6	10.3–186.8
Regional	5	24.0	6.9–32.2	32.6	27.3–35.0
County	13	65.8	16.0–187.7	29.8	11.8–84.9
p value for difference		< 0.001		0.698	
Population					
<25,000	29	5.2	1.0–13.0	33.2	10.3–84.9
25,000–49,999	39	8.8	4.7–65.0	26.2	11.8–186.8
50,000–99,999	20	25.8	9.1–79.0	31.0	15.0–97.4
100,000–249,999	8	39.8	16.0–79.5	31.0	6.6–45.9
>250,000	6	105.5	62.0–187.7	30.1	15.5–41.9
p value for trend		< 0.001		0.559	
Budget (thousands)					
< $100	4	3.5	1.0–5.0	26.2	10.3–60.0
$100–500	54	7.0	3.0–24.0	27.4	11.8–84.9
$500–1,000	17	11.8	6.0–27.7	31.2	15.0–52.7
$1,000–5,000	17	33.0	16.0–79.0	36.8	6.6–186.8
$5,000+	10	81.1	15.5–187.7	32.2	15.5–68.9
p value for trend		< 0.001		0.113	
Total	**102**	**9.9**	**1.0–187.7**	**29.9**	**6.6–186.8**

[1] Indicates health departments covering more than one municipality.

Table 2

Full-time equivalent (FTE) staff by job title, local health departments in New Jersey, 1998

Category	Number of FTEs	Percent of workforce
Health officer	108.5	4.8
Nurse director	61.9	2.7
Public health nurse	457.1	20.3
Epidemiologist	15.3	0.6
Public health planner	9.0	0.4
Health educator	70.7	3.1
Home health aide	78.9	3.5
Medical doctor	54.8	2.4
Laboratory director	9.7	0.4
Laboratory technician	30.3	1.3
Public health investigator	76.8	3.4
Counselor	62.4	2.7
Secretary	387.3	17.2
Administrative assistant	62.5	2.7
Supervisors	164.7	7.3
Registered environmental specialist	329.5	14.7
Animal control officer	109.2	4.8
Environmental specialist	68.7	3.0
Other	83.5	3.7
Total	**2,240.8**	**100.0** [1]

[1]Total does not amount to 100 percent due to rounding.

Core functions and organizational practices performance

Overall core function performance among LHDs in New Jersey was measured at 59.7 percent of a total possible 100 percent. For the three core functions identified by IOM in 1988, performance scores were: Assessment, 51.9 percent; Policy Development, 55.1 percent; and Assurance, 73.7 percent. Performance of the 10 organizational practices were reported as follows: (1) assess the health needs of the community, 57.5 percent; (2) investigate the occurrence of health effects and health hazards in the community, 36.6 percent; (3) analyze the determinants of health needs, 65.7 percent; (4) advocate for public health, build constituencies and identify resources in the community, 70.8 percent; (5) set priorities among health needs, 48.0 percent; (6) develop plans and policies to address priority health needs, 41.2 percent; (7) manage resources and develop organizational structure, 87.7 percent; (8) implement programs, 81.9 percent; (9) evaluate programs and provide quality assurance, 34.3 percent; and (10) inform and educate the public, 90.7 percent (see Figure 1).

Core function performance was examined for associations with the structure of the LHD, the population size served, or the size of the annual budget. There was no significant relationship between the performance of the three core functions and the structure of the LHD except for the assessment function between county and municipal health departments ($p = 0.03$). LHDs with larger budgets ($p = 0.009$) and serving larger populations ($p = 0.011$) were associated with higher performance scores for assessment but not for the other two functions. As expected, we found a very strong correlation between population size served and the size of the budget (Spearman correlation coefficient $r = 0.79$, $p = < 0.0001$). We also compared 18 health departments that scored above 75 percent in overall core function performance with 17 health departments that scored lower than 45 percent to see if any variables were related to good performance. When adjusted for population, we found that the higher performing health departments were more likely to have larger budgets and more staff per population served ($p = 0.037$). In addition, higher scores in all three functions were associated with stronger communications capabilities (Assessment $p = 0.005$, Policy Development $p = 0.027$, Assurance $p = 0.003$).

Discussion

The federal government defines public health infrastructure as the systems, competencies, relationships, and resources that enable performance of the 10 Essential Services.[29,30] The national interest in strengthening America's public health infrastructure continues to gain support in many states. The inclusion of public health infrastructure as a focus area in *Healthy People: 2010 Objectives*, new federal funding, technical assistance for states in areas such as model public health practice standards, and the emergence of new public health threats such as bioterrorism all will serve to increase the emphasis on improving public health systems on all levels of government.

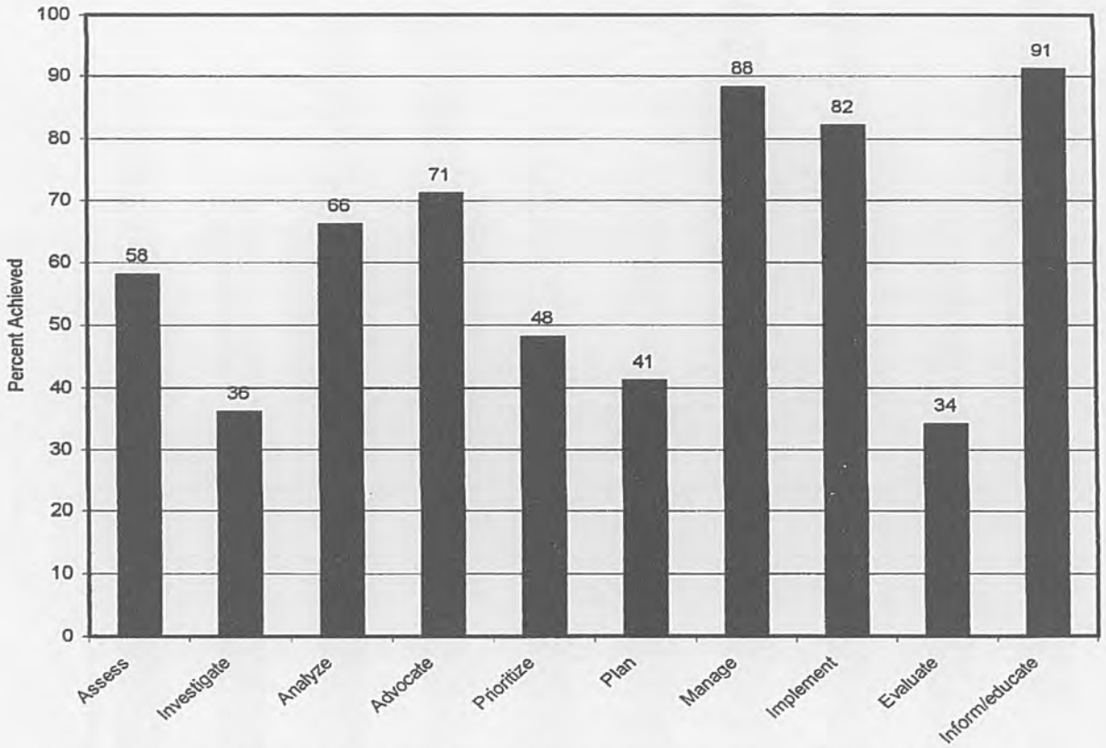

Figure 1. Organizational Practices Performance in New Jersey, 1998

Local public health budgets in New Jersey have increased by 48.4 percent ($124 million to $184 million) during the past three years. In 1994, local funds comprised 72.6 percent of all LHD budgets; by 1997, local funds comprised more than 80 percent of all budget funding.[25,31] State and federal financing for local public health services essentially has remained static during this same period. New Jersey law requires distribution of State Public Health Priority Funds to all applying health departments that meet the minimal population criteria of 20,000. Funding levels have been $3 to $4 million per year for the past decade. To maximize effectiveness, these funds have been prioritized for use in building LHD infrastructure capacity in accordance with policy initiatives (e.g., *Healthy People 2010,* Practice Standards for Local Public Health Systems, bioterrorism, and so forth).

Public health laws support the existence of independent LHDs that find themselves in competition with one another for local financing. LHDs report to one or more policy boards that vary widely in expertise, role, authority, and public health concerns. Structured, comprehensive communication and planning between and among the state health department, LHDs and LBOHs do not exist presently. Continuous quality assurance and accountability systems have not yet been developed to evaluate and monitor the quality of public health services in New Jersey. Therefore, local governments are forced to consider only cost without any measure of quality when determining how best to provide public health protection for their communities. These factors have had a great deal of influence on public health system capacity in New Jersey.

The categorical nature of public health programming and financing at the federal level has given rise to varying degrees of public health infrastructure capacity as well. Those programs with strong constituencies and substantial funding have developed capacities for data and information management, specific programmatic training, and evaluation ac-

tivities. While there are no data at the present time to show a relationship between a well-developed infrastructure and good public health practice performance, it is reasonable to believe that the two are associated closely. The development and implementation of national public health practice standards that would elicit standardized data to measure the relationship between public health infrastructure and desirable health outcomes is sorely needed. Standardized infrastructure data also are needed to guide organizational development at the state health department level as well. Such data would provide a solid foundation on which rational public health priority planning and funding could be based.

Public health infrastructure and capacity building efforts at the national level such as the development of public health performance standards and information technology standards for the Health Alert Network for bioterrorism preparedness[32] will help provide a standardized basis for evaluation. Through on-going information technology projects such as NJ LINCS, New Jersey's local public health system appears to be reasonably well positioned to handle evolving demands on public health communications and information management. Most LHDs do have access to PCs and most already are connected to the Internet. However, our survey did not collect specific data on the numbers and capacities of PCs in LHDs, their interconnectivity, or the extent to which staff use them in their daily activities.

Unfortunately, projects to integrate and share public health data have not progressed as rapidly as the acquisition of computer hardware. Many LHDs in New Jersey lack the basic capacity to collect, analyze, and disseminate public health information in real time, which compromises their ability to effectively monitor the health status of the populations they serve. This tends to minimize the value of LHDs to health care providers, consumers, and other agencies that influence the health of a community. The state health department plays a critical leadership role in analyzing and disseminating public health information and only recently has begun to address the need to provide integrated public health data and information.

Although the authors are not aware of a standardized set of performance measures with which these study findings could be compared, the results of core functions and organizational practices performance were remarkably similar to that found by Richards et al.[10] in a six-state study of local health performance and by Rohrer et al.[11] in a study of Iowa's LHDs. Poor performance in the four practices of investigating public health problems (36.6%), evaluating public health services (34.3%), prioritizing health needs (48.0%), and developing plans to meet priority health needs (41.2%) reveal serious gaps in the capacity of New Jersey's current public health system. This is particularly true for activities requiring specific expertise such as epidemiology, biostatistics, laboratory sciences, community organizing, and planning. Therefore, future capacity-building efforts in New Jersey should be focussed on acquiring this expertise to improve organizational capacity, develop new competencies in the existing workforce, and improve information systems and communications. Additional inquiries that capture standardized data are needed to establish a context in which performance measures such as these can be interpreted.

While a significant relationship was found between size and budget of the health department with overall performance scores when comparing high performers with low performers, we did not control for the types of activities performed or services provided. These data imply that health departments spending more are investing in those services that improve core function performance. However, LHDs with larger budgets and more staff may be providing a broader range of services or more costly services while still performing better in core functions due to other factors not understood at this time. Data were collected on the types of activities performed by each health department and analyses to determine what activities and/or services are associated with good core function performance are under way.

Because these data are self-reported and some questions were open to a wide range of interpretation, statewide core function performance may be overestimated. More definitions of what was expected to be performed to answer affirmatively to questions specifically related to the more sophisticated and labor-intensive activities most likely would have lowered the scores even further. However, the overall performance and the particularly poor performance in four organizational practices are good indicators of where improvement efforts must be focussed. National public health performance standards and better methods for validating

results will improve accuracy and comparability over time. We found this analysis to be inexpensive and useful in addressing weaknesses in New Jersey's public health infrastructure.

Data also are needed to assess state health departments' capacities and performance of core functions. It is reasonable to assume that performance at the local level is dependent on performance at the state level. Consequently, data are needed to measure the effectiveness of the interactions and interrelationships between state and local health departments that are attributable to core function and overall public health performance. This is especially true for the assessment function because LHDs rely heavily on the state for data with which to monitor the health of their populations. At the present time, there are no data to support these suppositions. States looking to improve public health systems capacity should use simple standardized methods to collect data necessary to guide problem analyses and establish baseline performance from which system improvement can be measured. In addition, state health agencies will need to assess their own infrastructure performance and capacity and must be prepared to implement organizational changes that are consistent with evolving national public health performance standards.

Population-based public health services have been neglected in the national quest for good health and a high quality of life despite the fact that 25 of the additional 30 years added to the life span of Americans during the past 100 years can be attributed to its practice.[33] As a nation, the public's overwhelming choice has been to finance personal health care, which has far less impact on health status. Less than one percent of all health care dollars in the United States are spent for public health prevention activities that address the root causes of society's health problems.[34,35] Public health infrastructure, the foundation on which new expertise and effective service delivery rely, will become increasingly important as public health challenges continue to change in nature and complexity over time.

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