Big Cities Health Coalition
Epidemiology Capacity Assessment, 2017
Executive Summary

Background

Since 2001, the Council of State and Territorial Epidemiologists (CSTE) has conducted periodic Epidemiology Capacity Assessments (ECAs) to assess numeric and functional applied public health epidemiology capacity in the United States and its territories. In 2017, the ECA instrument was tailored for local health department use and administered in collaboration with the Big Cities Health Coalition (BCHC) to its member health departments. The 2017 ECAs were designed to achieve four goals:

1. Enumerate and describe the applied epidemiology workforce.
2. Describe the skills of the applied epidemiology workforce.
3. Describe the funding supporting the applied epidemiology workforce.
4. Describe epidemiology capacity in targeted health departments.

Methods

The state ECA was modified by CSTE and BCHC and pre-tested in a small number of cities. All BCHC members were invited to participate. Data collection occurred over a nine-week period from October to December 2017. Quantitative data were analyzed using Epi Info 7 and Excel 2017, and qualitative data were coded and grouped thematically. Where relevant, data were compared with those from the 2017 state ECA.

Key Findings

A total of 27 of the 30 BCHC members participated in the assessment. The combined population served by the participating health departments was over 55 million or about 17% of the total US population.

Health department structure and leadership

Nearly half (48%) of the health departments reported that their epidemiology workforce was decentralized across the health department. Approximately a fifth (18%) do not have a dedicated lead who oversees epidemiology activities. The vast majority (78%) have generalist epidemiologists who support several or all public health program areas.

Presence of programs and lead epidemiologists by program area

Most or all of the 27 health departments have programs in infectious disease (100%), maternal and child health (MCH, 100%), preparedness (100%), chronic disease (93%), vital statistics (92%), and environmental health (85%); fewer have programs in mental health (33%) and occupational health (19%). Programs that were most likely to have lead epidemiologists were infectious disease (85%), MCH (74%), and vital statistics (67%).

Staffing

There are 1,091 full time equivalent (FTE) epidemiologists working in the 27 participating BCHC departments (range 3-385; median 18). The median rate among the 27 BCHC jurisdictions is 1.4 epidemiologists per 100,000 people, with a range of 0.4 to 7.5. In comparison, the total number of epidemiologists in state health departments is 3,370, and the median rate is 1.0/100,000. A total of 43% of the BCHC epidemiologists work in infectious disease, with an additional 18% working as generalists. To reach full capacity, BCHC departments reported they would collectively need a 40% increase in epidemiology staff (n=434). The greatest perceived needs were in infectious disease (138), followed by generalists (40).
Funding for epidemiologic activities

On average, 47% of the funds for epidemiology activities in participating departments come from local sources, with the state and federal governments providing an additional 24% and 27%, respectively. Values were similar for epidemiology personnel, with 44% of funding coming from local sources, 24% from state sources, and 29% from federal sources.

Health department epidemiology capacity

Health departments were asked to rate their capacity to conduct the four essential public health services most closely related to epidemiology. Virtually all participating BCHC departments (93%) reported having substantial to full capacity to monitor health status to identify and solve community health problems. Most (78%) also have substantial to full capacity to diagnose and investigate health problems and health hazards in the community. However, only 41% reported substantial to full capacity for evaluating effectiveness, accessibility, and quality of personal and population-based health services, and even fewer reported substantial to full capacity for researching new insights and innovative solutions to health problems (33%). For these latter two essential services, 26% and 37%, respectively, reported minimal to no capacity. When asked about capacity to conduct the four essential services by program area, at least 80% of departments felt they had adequate capacity in infectious disease, MCH, chronic disease, injury, and preparedness. The program areas most frequently identified as a high priority for improving capacity were chronic disease (48%), substance abuse (44%), infectious disease (41%), and informatics (37%).

Hiring

Sixty percent of the 27 participating BCHC departments require a master’s degree as a minimum hiring requirement for entry-level epidemiology positions in their department, and nearly half (48%) require two or more years of experience. More than half (56%) use contractors to fill vacancies for epidemiology/surveillance positions at the master’s degree level and above. There are currently 83 vacant positions, including 75 civil service positions (90%) and 8 (10%) contractor positions, with the greatest number of vacancies in infectious disease (19), general epidemiology (17) and chronic disease (15). However, vacancies represent a small fraction (19%) of the number of epidemiologists needed to achieve full capacity.

Training priorities

The most pressing staff training need was data analytics (e.g., informatics, translating and applying public health data). Other training priorities included systems thinking, persuasive communication, software skills, and general continuing education.

Salaries for civil service epidemiologists

Minimum and maximum civil service salaries in participating BCHC departments increased with educational attainment, although the median minimum and maximum salaries for physicians were considerably higher than for other doctoral-trained staff or veterinarians. Salaries also increased by career level. The median minimum and maximum salaries for the BCHC departments were generally higher than for state health departments, with the exception of physician salaries, which were higher in the states.

Critical issues facing health departments

Responding BCHC member departments reported major challenges communicating the value and role of epidemiologists to various audiences, obtaining adequate funding, and achieving and maintaining adequate functional capacity to carry out essential tasks, balancing routine activities with emerging problems and recruiting and training staff (especially in increasingly important areas like social determinants of health and health equity).
Conclusions

- BCHC member departments contribute substantially to national epidemiology capacity, employing nearly 1,100 epidemiologists, approximately one third the number working in state health departments.

- The ratio of epidemiologists per 100,000 population exceeds the recommended value for state health departments, but the number of epidemiologists varies widely among departments, and some cities are woefully under-resourced. Even in well-staffed departments, there is a perceived need for a significant increase in capacity. Efforts are required to assess the ideal staffing ratios for large urban health departments and to increase epidemiology capacity in under-resourced departments.

- While BCHC health departments have substantial capacity to conduct two of the four essential public health services most closely related to epidemiology—monitoring health status and diagnosing and investigating community health hazards—greater efforts are needed to improve capacity for the remaining two—evaluating population-based health services and researching innovative solutions to health problems. BCHC departments must explore opportunities to diversify funding to support research and evaluation and should also engage academic public health institutions to explore how they might partner to supplement existing capacity.

- Although BCHC departments differ considerably in organizational structure, all provide epidemiology capacity for core public health programs, including infectious diseases, MCH, and preparedness. Most also provide epidemiologic services in chronic disease, vital statistics and environmental health. There is a notable gap in capacity for mental health and informatics epidemiology services. Departments should consider increasing epidemiologists in underserved areas so that activities and staffing better align with disease burdens and public health priorities (e.g., violence, substance abuse, social determinants, of health and health equity) in their jurisdictions.

- There are reported gaps in training. BCHC departments should explore partnerships with public health training centers and schools and programs of public health to address training gaps in informatics, data translation, systems thinking, and persuasive communication among current and future staff.