Assessing Applied Epidemiology Competencies in the Virginia Department of Health Workforce

Ami S. Patel, PhD MPH[1,2] Timothy A. Powell, MPH[1] C. Diane Woolard, PhD MPH[1]

[1]Division of Surveillance and Investigation, Virginia Department of Health, Richmond, VA
[2]Epidemic Intelligence Service, Centers for Disease Control and Prevention, Atlanta, GA

ABSTRACT

INTRODUCTION: Epidemiologists play critical roles in public health; until recently, no formal standards existed for epidemiology practice. In 2005, the Centers for Disease Control and Prevention (CDC) and Council of State and Territorial Epidemiologists (CSTE) drafted applied epidemiology competencies that provide a foundation for expectations and training programs. Using these competencies, we assessed baseline applied epidemiology competency for Virginia Department of Health (VDH) epidemiologists.
METHODS: Eight epidemiologists representing multiple divisions developed a survey based on CDC/CSTE competencies. Individuals who self-identified themselves as epidemiologists were asked to participate. Within each skill domain (assessment/analysis, basic public health sciences, communication, community dimensions of practice, cultural competency, financial/operational planning and management, leadership and systems thinking, policy development), specific competencies were listed. For each competency, frequency and confidence in performing and need for training was measured using Likert scales. Differences between three tiers of practice were assessed by using analysis of variance.
RESULTS: Eighty-eight persons from 10 VDH program areas responded. Respondents had a median of 4 years of experience with 52% completing formal epidemiology training. Respondents identified themselves as Tier 1/entry-level (38%), Tier 2/mid-level (47%), and Tier 3/senior-level (15%) epidemiologists. Compared to lower tiers, Tier 3 epidemiologists more frequently performed financial/operational planning and management (P = 0.023) and communication activities (P = 0.018) and had higher confidence in assessment/analysis (P < 0.001). Training needs were highest for assessment/analysis and basic public health sciences.
CONCLUSIONS: VDH has a robust epidemiology workforce with varying levels of experience. Frequency and confidence of epidemiologists in performing competencies varied by tier. VDH will use this data to plan targeted training.

CDC/CSTE Applied Epidemiology Competencies

- Competencies for Applied Epidemiologists in Governmental Public Health Agencies (AECs) released in 2006 — www.cste.org/competencies.asp
- Established by Centers for Disease Control and Prevention (CDC) and Council of State and Territorial Epidemiologists (CSTE) working group
- Designed to define the expected skills of applied epidemiology practitioners

Competency Skill Domains

- Assessment and analysis
- Basic public health sciences
- Communication
- Community dimensions of practice
- Cultural competency
- Financial and operational planning and management
- Leadership and systems thinking skills
- Policy development skills

Tiers of Practice

- Competencies defined for four tiers of epidemiology practice based on level of experience and education
  - Tier 1: Entry-level or Basic Epidemiologist
  - Tier 2: Mid-level Epidemiologist
  - Tier 3a: Senior-level Epidemiologist, Supervisor, or Manager
  - Tier 3b: Senior Scientist/Subject Area Expert

OBJECTIVES

- Characterize the Virginia Department of Health (VDH) epidemiology workforce
  - Capacity, experience, education
  - Frequency of performing and confidence in core competencies
- Use results to plan education and training opportunities

METHODS

Survey development

- Eight VDH epidemiologists from multiple program areas formed workgroup
- Workgroup developed survey closely based on CDC\CSTE AEC statements
- For each competency four questions asked
  - Responses in Likert Scale 1 (Low) to 5 (High)

Competency Specific Survey Questions

- Does your position involve this activity? (Y/N)
- If yes, frequency?
- What is your confidence level in performing this activity?
- What is your interest in additional training in this activity?

General Survey Questions

- Highest level of education
- Clinical degrees and licensure
- Highest level of epidemiology training
- Years of experience in epidemiology
- Program area
- Tier of epidemiology practice

Survey Administration

- Administered via internet survey site August 14-25, 2006
- Division directors, health directors, and nurse managers self-identified epidemiologists

Survey Analysis

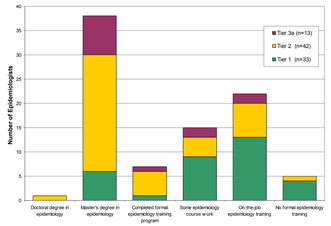
- Respondents that performed >75% of all competencies within a skill domain were classified as performing skill
- Mean score calculated for each skill domain
  - Arithmetic average of five-point Likert scale
  - Calculated only for persons performing a skill
- Differences between mean scores assessed using ANOVA

RESULTS

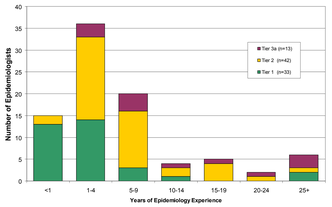
Respondent Characteristics

- 88 respondents included in analysis
- 15% Tier 1 (n=13); 48% Tier 2 (n=42); 37% Tier 3 (n=33)
- 65% no professional licensure
- 38% local/district health department; 50% Office of Epidemiology; 12% Other

Epidemiology Training by Tier of Practice



Epidemiology Experience by Tier of Practice



Competency Assessment

Mean self-rated frequency of performing skill domain

Skill domain	N*	%	All tiers	Tier 1	Tier 2	Tier 3a	*p* value
Assessment and analysis	57	65	3.3	3.3	3.4	3.3	.79
Basic public health sciences	52	59	3.5	3.3	3.6	3.5	.51
Communication	45	51	3.1	2.6	3.1	3.8	.02
Community dimensions of practice	42	48	2.5	2.5	2.5	2.4	.88
Cultural competency	30	34	2.8	2.9	2.8	2.8	.97
Financial and operational planning & management	28	32	3.1	2.6	2.9	3.6	.02
Leadership and systems thinking	52	59	2.7	2.3	2.7	2.9	.21
Policy development	22	25	2.6	2.1	2.6	2.9	.34

Mean self-rated confidence of performing skill domain

Skill domain	N*	%	All tiers	Tier 1	Tier 2	Tier 3a	*p* value
Assessment and analysis	57	65	3.7	3.3	3.9	4.0	.001
Basic public health sciences	52	59	3.5	3.2	3.7	3.5	.08
Communication	45	51	3.5	3.3	3.5	3.9	.19
Community dimensions of practice	42	48	3.4	3.1	3.6	3.4	.25
Cultural competency	30	34	3.5	3.0	3.6	3.5	.17
Financial and operational planning & management	28	32	3.5	3.4	3.3	3.8	.19
Leadership and systems thinking	52	59	3.6	3.3	3.7	3.4	.08
Policy development	22	25	3.5	3.3	3.6	3.4	.72

Mean self-rated need for additional training in skill domain

Skill domain	N*	%	All tiers	Tier 1	Tier 2	Tier 3a	*p* value
Assessment and analysis	57	65	3.8	4.1	3.8	3.6	.45
Basic public health sciences	52	59	3.7	3.7	3.7	3.6	.92
Communication	45	51	3.6	3.5	3.6	3.4	.81
Community dimensions of practice	42	48	3.3	3.1	3.5	3.1	.55
Cultural competency	30	34	3.2	3.5	3.1	3.0	.68
Financial and operational planning & management	28	32	3.1	3.0	3.3	3.0	.84
Leadership and systems thinking	52	59	3.4	3.4	3.4	3.3	.94
Policy development	22	25	3.2	3.4	3.5	2.8	.48

CONCLUSIONS

VDH Epidemiology Workforce

- Robust in terms of number, educational and professional backgrounds, and years of experience
  - Approximately 50% did not have formal epidemiology training
  - Majority of workforce hired to fill positions established by Emergency Preparedness and Response funds in 2002

Competency Assessment

- Activities most frequently performed
  - Assessment and analysis
  - Basic public health sciences
- Tier 2 epidemiologists had higher mean confidence in performing competencies within 5/8 skill domains

Training Needs

- Varied by practice tier, professional background, years of experience, and level of epidemiology training
- Training needs highest for assessment and analysis and basic public health sciences
- Desire for sustained training is high

Utility of Competencies

- Provides a baseline assessment of skills and training needs
- Competencies may serve more practical purpose in providing guidance on specific job functions
  - Not all positions incorporated all competencies

Limitations

- Survey cohort identified via self-selection—true denominator unknown
- Self-report
- Assessment focused on specific activities performed on the job
  - Did not assess abilities and experience in competencies not relevant or required in current position

Virginia Applied Epidemiology Competency Working Group: John Ambrose, MPH; Derek Chapman, PhD MS; Candace Hamm MPH; Jeff Stover MPH; Betty Rouse.