Identifying Core Competencies in Doctoral-Level and Master-Level Epidemiological Training

Larissa R. Brunner Huber, Ph.D.
Kristopher Fennie, Ph.D.
Brett Ange, Ph.D.
Nicole Cook, Ph.D.
ACE Education Committee
Why look at competencies?

- Improve quality of educational programs by ensuring appropriate curricula
- Produce more effective epidemiologists
- Interest in developing competencies for various fields
  - Medicine
  - Public health
  - Nursing
Prior efforts to identify competencies for epidemiology

- ACE/ASPH Workshop on Doctoral Education in Epidemiology (2002)
- ASPH MPH Core Competency Development Project (2006)
“Gaps” in prior efforts

- Competencies only mention MPH degrees
  - Are competencies for MSPH, MS in epidemiology same or different?

- Many competencies specific for working in government agency
  - Are competencies same or different for other settings?
Overall goal

- To identify domains and core competencies for epidemiological training at doctoral and master levels.
Survey of “established” epidemiologists

- Demographic information
- Asked to rate importance of previously identified domains, competencies
  - Very important, important, neither important nor unimportant, unimportant, unsure
  - For MS, MSPH, MPH, and PhD, ScD, or equivalent
- Open-ended question asked if any other competencies not covered and important for graduate training in epidemiology
Step 1: On-line surveys

- Survey of recent graduates of epidemiology programs
  - Demographic information
  - Asked to indicate if identified domains, competencies very important or important to them since graduating and starting to work
  - Asked if graduate program adequately prepared them in domain
    - Yes; no, had to ask mentors/co-workers for help; no, had to attend workshops/other educational offerings to gain proficiency; no, had to consult other outside resources
  - Open-ended question asked if any other competencies not covered and important to them since graduating
Step 1: On-line surveys

- Assistance from ACE office staff to identify “established” epidemiologists
  - Sample of members, fellows, emeriti, and honorary fellows
  - Hoped to get individuals from variety of professional settings
Step 1: Online surveys

- Assistance from ACE office staff to identify recent graduates
  - Trickier!
  - Used associate member list
    - Limited numbers
    - No good way to assess if current members are recent graduates
  - Tried student organizations such as SER Student Caucus
    - But do not keep a list of alumni
  - Reached out to Education Committee members to suggest additional potential participants
    - Recent graduates identified by several individuals working at universities, CDC
Step 1: On-line surveys

- All individuals sent email from ACE Office inviting them to participate
- Brief description of study, link to survey
- Data collected from February to April 2009
Results: “Established” epidemiologists (n=147)

- **Age**
  - < 35 years: 8.2%
  - 36-45 years: 20.4%
  - 46-55 years: 23.1%
  - 56-65 years: 32.7%
  - > 65 years: 15.6%

- **Sex**
  - Female: 42.2%
  - Male: 57.1%
  - Missing: 0.7%

- **Setting of most recent job**
  - Academic: 41.5%
  - Hospital: 12.9%
  - Government: 15.6%
  - Private research or industry: 8.2%
  - Other: 20.4%
  - Missing: 1.4%
**Results: “Established” epidemiologists**

- **Degrees**
  - MPH only: n=20
  - MPH + DrPH: n=8
  - MPH + PhD, ScD, or equivalent: n=32
  - MS only: n=8
  - MS + DrPH: n=1
  - MS + PhD, ScD, or equivalent: n=14
  - MS + PhD, ScD, or equivalent + DrPH: n=1
  - MSPH only: n=1
  - MSPH + DrPH: n=2
  - MSPH + PhD, ScD, or equivalent: n=3
  - DrPH only: n=2
  - PhD, ScD, or equivalent only: n=39
  - No formal training in epidemiology: n=16
Competencies viewed as important, very important for all degrees

- Identifying public health problems
- Applying principles of good ethical, legal practice as related to study design, data collection, data use
- Managing, analyzing, summarizing data, drawing conclusions from data
- Using effective communication technologies
- Presenting data in tabular, figure form
- Searching literature
- Identifying data from existing sources
- Reviewing, critically evaluating literature
- Describing population by race/ethnicity, culture, etc.
- Producing descriptive epidemiology, understanding strengths and limitations of descriptive statistics
- Principles of screening, surveillance systems
- Identifying leading causes of death
- Understanding human subjects protection
Results: “Established” epidemiologists

- Competencies viewed as neither important nor unimportant, unimportant for all degrees
  - Evaluating programs
  - Using lab resources to support epidemiologic activities
  - Establishing relationships with groups of special concern (e.g. groups subject to disparities, historically underrepresented groups)
  - Implementing operational and financial plans
  - Promoting organization’s vision in programs, activities
  - Using performance measures to evaluate, improve epidemiology program effectiveness
  - Promoting workforce development
  - Preparing for emergency response
Results: “Established” epidemiologists

- Select competencies viewed as important, very important for doctoral level only
  - Designing surveillance systems to include groups subject to health disparities
  - Conducting investigations by using language, and other approaches tailored to population under study
  - Recommending public health actions relevant to affected community
  - Bringing epidemiologic perspective to development, analysis of public health policies
  - Assisting in preparation of proposals for extramural funding
  - Using management skills
  - Identifying major gaps in knowledge
  - Formulating original, key hypothesis
  - Designing a study
  - Identifying, minimizing sources of bias
  - Using methods of measurement (designing data collection forms, determining validity of instrument, etc.)
  - Examining data for presence of confounding, interaction
Results: “Established” epidemiologists

- Discrepancies with master-level competencies
  - Numerous competencies viewed as important, very important for only certain master degrees
Select discrepancies

- Providing epidemiologic input into epidemiologic studies, public health programs, community public health planning processes at state, local, tribal level
  > MS: 74%, MSPH: 59%, MPH: 51%
- Understanding general history of development of epidemiology
  > MS: 62%, MSPH: 61%, MPH: 71%
- Understanding advantages, limitations of study designs to address specific problems
  > MS: 69%, MSPH: 65%, MPH: 74%
- Interpreting, recognizing implications of research results
  > MS: 67%, MSPH: 68%, MPH: 74%
Results: recent graduates (n=36)

- **Age**
  - < 35 years: 58.3%
  - 36-45 years: 38.9%
  - 46-55 years: 2.8%

- **Sex**
  - Female: 69.4%
  - Male: 30.6%

- **Setting of current job**
  - Academic: 50.0%
  - Hospital: 13.9%
  - Private research or industry: 33.3%
  - Government: 0%
  - Missing: 2.8%
Results: recent graduates

- Degrees
  - MS + PhD: n=3
  - MS + MPH: n=1
  - MS + MPH + PhD: n=1
  - MSPH: n=2
  - MSPH + PhD: n=1
  - MPH: n=10
  - MPH + PhD: n=8
  - MPH + DrPH: n=1
  - PhD only: n=8
Results: recent graduates

- Domains master-level graduates felt less prepared in
  - Assessments and Analysis (MS and MSPH)
  - Basic Public Health Science (MS)
  - Communication (MS and MSPH)
  - Basic Knowledge of Leading Public Health Problems, History of Discipline (MSPH)
  - Problem Conceptualization (MSPH)
  - Data Collection and Monitoring (MS and MSPH)
  - Study Design (MSPH)
  - Data Management (MS and MSPH)
  - Data Analysis (MSPH)
Results: recent graduates

- Domains PhD, ScD, or equivalent graduates felt less prepared in
  - Basic Public Health Science
  - Biology
Roundtable

- What are the similarities and differences among MS, MSPH, and MPH degrees in epidemiology and are there different expectations for individuals receiving these degrees?
- Do competencies differ by job setting (i.e. academic, hospital, government, and private research/industry settings)?
- Contact information for individuals interested in taking part in Delphi process
Next Steps

- Delphi process
  - Experts in field from variety of job settings
  - Recent graduates
  - Current graduate students
  - Series of on-line surveys
    - Gather expert opinions
    - Synthesize opinions
Next Steps

- Disseminate results
  - Annals of Epidemiology
- Teaching workshops
Questions?
Suggestions for individuals to take part in Delphi process?

- Larissa R. Brunner Huber
  - lrhuber@uncc.edu

- Kristopher Fennie
  - Kristopher.fennie@yale.edu