

Recruitment, the Pipeline, and the Placement of Undergraduate Students into Epidemiology

Richard Riegelman MD, PhD

Professor and Founding Dean

George Washington University

School of Public Health and Health Services

Fellow American College of Epidemiology

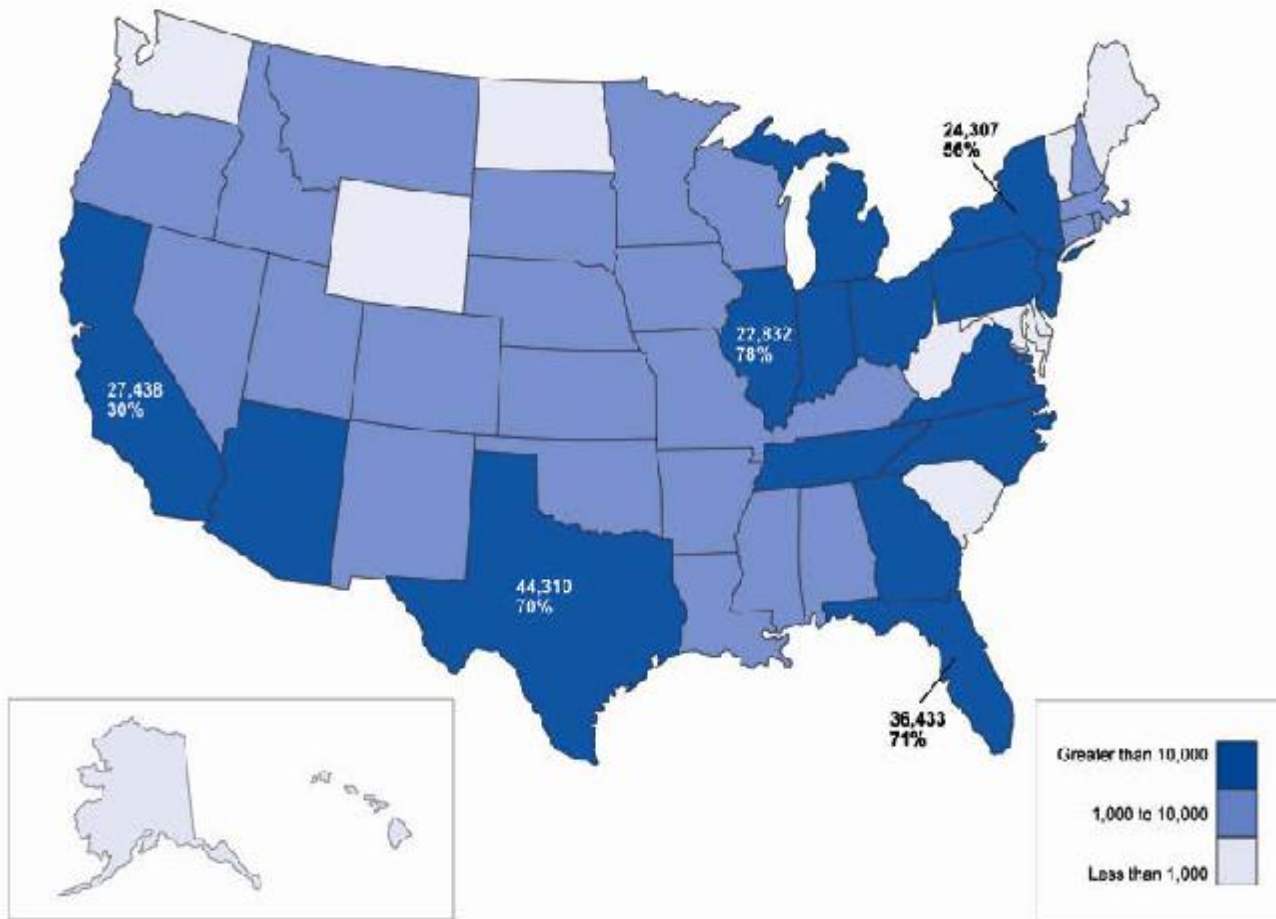
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American College of Epidemiology

Why the Need for a Pipeline

- Over 250,000 public health workers will be needed by 2020 to replace retirements and return ratio of public health workers to population to 1980 ratio- ASPH
- Epidemiology is a discipline in great current and future need

The Projected Public Health Workforce Shortage in 2020, by State



Impact of Retirement

- 19% of local public health workers eligible for retirement NACCHO
- 24% of state public health workers eligible for retirement ASTHO
- 44% of the CDC's workforce will be eligible to retire within 5 years
Partnership for Public Service

Current Need for Epidemiologist Survey of State Health Departments

- Need for over 30% increase in epidemiologist to fill existing capacity
- Over 1/3 of epidemiologist in State Health Departments did not have masters level public health degree or degree in epidemiology

Boulton ML, Lemmings J, Beck AJ. Assessment of Epidemiology Capacity in State Health Departments *J Public Health Management Practice*, 2009, 15(4), 328-336

Strategies

- Get them interested in epidemiology in high school
- Get them interested in public health and epidemiology in college
- Integrate epidemiology and evidence-based public health into undergraduate and clinical education
- Structure associate degrees with career ladders that encourage entry into the field
- Tie goals to Healthy People 2020

K-12 Initiatives

- Young Epidemiology Scholars (YES)
- Mathematics/Statistics Standards
- Advanced Placement Examination

Young Epidemiology Scholars (YES)

Project of RWJ Foundation and CDC to integrate epidemiology into middle and high school. Has 3 components

1. Science Olympiad "Disease Detectives" regional and national events
2. YES research awards
3. YES curriculum materials

Disease Detective- Science Olympiad

- Regional and National School/team competitions
- Middle school emphasizes descriptive epidemiology
- High school emphasizes analytical epidemiology

YES Research Awards

- Open to high school juniors and seniors
- Annual focus: 2010 Public Health Problems related to Population Growth
- 120 college scholarship awards including 12 national awards of \$15-\$50,000

YES Curriculum Materials

- Over 25 interactive case studies including teacher's guides available at <http://www.collegeboard.com/yes/ft/iu/home.html>
- Designed to integrate into wide range of middle school and high school subjects including biology, mathematics, social sciences.
- Many case studies provide material that is appropriate for college students

National Council of Teachers of Mathematics Data Analysis and Probability Standard

I- Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them

II: Select and use appropriate statistical methods to analyze data

III: Develop and evaluate inferences and predictions that are based on data

IV: Understand and apply basic concepts of probability

American Statistical Association GAISE Report Pre-K to 12

- Designed to complement mathematical standards and provide a conceptual framework for K-12 statistics education
- “In mathematics context obscures structure. In data analysis context provides meaning.”
- “...should emphasize the ways probability is used in statistical thinking; an intuitive grasp of probability will suffice at these levels.”

GAISE Pre-K- 12 Framework

I: Formulate Questions

- Clarify the problem at hand
- Formulate one (or more) questions that can be answered by data

II: Collect Data

- Design a plan to collect appropriate data
- Employ the plan to collect data

GAISE- Pre-K to 12 (cont.)

III: Analyze Data

- Select appropriate graphical and numerical method
- Use these methods to analyze data

IV Interpret Result

- Interpret the analysis
- relate the interpretation to the original questions

Statistics

Advanced Placement Test

- Begun in 1997, one of the most rapidly grown AP tests
- Approximately 100,000 students take per year vs. 250,000 for first semester calculus
- Often a two semester high school course that parallels a one semester introductory college statistics course

AP grade distribution for 2007/08

Statistics

5=11.9%

4=21.5%

3=25.4%

2=17.1%

1=24.1%

Calculus

5=22.1%

4=21.2

3=17.1

2=15.2

1=23.7

<http://en.wikipedia.org/wiki/AP>

Institute of Medicine (IOM) Recommendations*

- *"Public Health is an essential part of the training of citizens"*
- *"...all undergraduates should have access to education in public health"*

*Gebbie K, Rosenstock L, Hernandez LM. Who will keep the public healthy? Educating public health professionals for the 21st century. Washington DC: National Academy Press; 2003: 144.

Consensus Conference

- 2006 Sponsored by APTR, ASPH and the Council of Colleges of Arts and Sciences (CCAS) and Association of American Colleges and Universities (AAC&U)
- Developed recommendations for core courses and minors in public health
- Recommended Public Health 101 and Epidemiology 101 as core courses

Epidemiology 101: A way of thinking

- Designed to teach the scientific method preparing students to read the research as well as the newspaper
- Focused on etiology and effectiveness/safety with only modest use of mathematics
- Option for “epidemiology laboratory” with applications of evidence-based thinking to satisfy science distribution requirement

Epidemiology 101 Framework

- **History, Philosophy, and Uses of Epidemiology**
- **Descriptive Epidemiology**
- **Association and Causation**
- **Analytic Epidemiology**
- **Evidence-Based Public Health and Evidence-Based Recommendations**
- **Applications to Policy and Basic and Clinical Sciences**

Undergraduate Public Health- Fall 2008

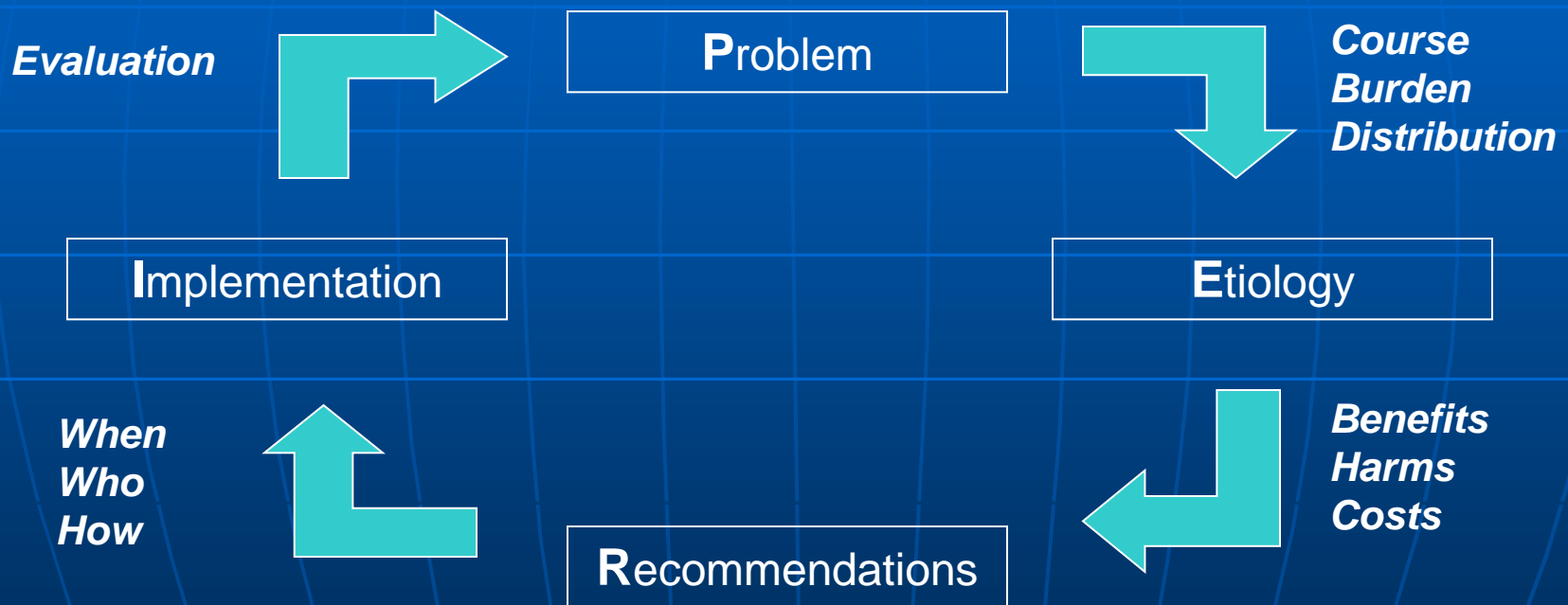
- AAC&U/ASPH survey found that 16% of undergraduate institutions have minor/major in public health generally including "Epidemiology 101"
- Approximately 50% of institutions with graduate public health offer undergraduate majors or minor
- Only 5% of bachelors degree institutions offer undergraduate majors or minors

Integrative Public Health

- AAC&U moving to create integrative curriculum
- Evidence-based Public Health designed to provide integrative approach built upon epidemiological principles

Evidence-Based Public Health

The P.E.R.I. Approach



Community Colleges and Public Health

- Community Colleges currently education 59% of new nurses and the majority of other new health-care workers
- Very few public health education programs at Community Colleges

Community Colleges

Community Colleges are key to reaching underserved minorities-

Minorities: 35%

- Black: 13%
- Hispanic: 15%
- Asian/Pacific Islander: 6%
- Native American: 1%

Data: American Association of Community Colleges

Public Health and Community Colleges

Potential to introduce public health as part
of general education curriculum including

“Public Health 101”

“Epidemiology 101”

“Global Health 101”

Potential for career oriented programs etc

Environmental Health Technician

Public Health Preparedness

Epidemiology Technician

Epidemiology Technician

- Linked to Health Information Systems Programs developing at Community Colleges
- Intended as entry level epidemiology assistant
- Intended to provide career ladder into health information systems or epidemiology

Education for Health

