


Preparing Students to Engage in Public Health Research of Consequence

 See also Galea and Vaughan, p. 1531.

Public health professionals face a complex array of old and new health problems, including both familiar and emerging infectious diseases and a rise in the incidence of noncommunicable diseases around the world, largely as a function of our health behaviors. In the United States, health inequities continue to increase in many areas. While the new and novel—such as the gene variant of the day—may generate great media excitement, attending to known risk factors and health inequities is likely to be more consequential in terms of public health outcomes. Witness the recent cancer moonshot announcement, with its disproportionate emphasis on clinical immunologic therapies rather than prevention.^{1,2} Consequential research that improves health outcomes is needed now, more than ever before. How do we motivate students—and faculty—to regard such research as valuable and choose to engage in public health research of consequence?

FOCUS ON REDUCING THE GREATEST HEALTH THREATS

Public health research of consequence should focus on

what matters most—the health risks and threats that are the greatest sources of morbidity, mortality, and health care costs.¹ Expectations for return on investment pervade most health fields. A focus on consequential health threats and risks should be met with a parallel emphasis on measurement, metrics and methods, including assessment of costs. These are knowledge and skill areas that students should master and practice. If students are to be prepared to engage in public health scholarship of consequence, they must see faculty members who model such focus.

In the United States, especially, there often is a mismatch of both academic research emphasis and allocation of federal research dollars toward problems that may be exciting but are not the most compelling in morbidity, mortality and health care costs.³ In writing about the field of epidemiology, Galea called for a consequentialist approach which would be centrally concerned with improving health outcomes.⁴ (p1187) To achieve that scholarship, we must modify how we educate public health students, including the research skills they are expected to develop, the experiences they have while in training and the people who mentor them.

in our conducting research that benefits the public good.

ETHICS AND INEQUITIES

The goal of improving health outcomes should be grounded in public health ethics and a commitment to reducing health inequities. From the very first day of training to the very last, and through a lifetime of public health, ethics should underpin our training, our actions, our mental models, research, and life's work. A fundamental part of ethics is a commitment to overcome health inequities wherever they occur and to work in participatory, respectful research partnerships with communities. Ethical principles give students tools to analyze health problems and potential interventions and a context for their interactions with communities.

EXPOSE STUDENTS TO THE EXCITEMENT AND MEANING OF PRACTICE

All MPH students must undertake practice. Ideally, these experiences should embed students in the life of public

SO WHAT?

The late Ward Cates, MD, MPH, wrote that we should cast our nets more broadly into the social and program sciences arenas, to help assess effectiveness rather than efficacy and to ensure that society gets the best value for its health investments.⁵ He called on colleagues to ask consequential questions like “so what?” and “how much?”⁵ Although Cates was focused on epidemiology, his points transcend disciplines. These are important questions that should be constant touchstones in our educational programs, research and professional lives. Faculty mentors should ask students these questions, and as students choose thesis and dissertation topics, such questions should be central. “So what?” and “how much?” really do matter.

We may pride ourselves on the rich intellectual climate of universities, but it has often surprised me that decisions about what questions faculty members pursue is considered largely an individual enterprise. Particularly in public universities and research institutions, the public has a stake

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health—and not just government public health. What do practitioners, community members, and leaders care about and need? For what problems and issues are critical information and evidence missing?

Every school of public health should have professors of the practice, and they and others should help students understand some of the challenges of, relevant questions for and opportunities to improve public health practice through meaningful practice-based research projects.

Collectively, these efforts can lead to what Lawrence Green has advocated: evidence-based practice and practice-based evidence (e.g., in 2014),⁶ which are needed to bridge the science-to-practice gap.

EVIDENCE AS A CRITICAL BUILDING BLOCK

Master's students should be good consumers of evidence, and doctoral students should generate evidence and participate in at least one evidence synthesis. They should all be familiar with Web sites of sources like NICE (England) and the US Task Force on Community Preventive Services. Understanding the state of evidence in different domains teaches us where pressing areas of insufficient evidence lie; these are often the most consequential in public health. In addition, when we analyze others' research and understand how it is vetted and valued in evidence reviews, student researchers may be more careful and diligent about collecting necessary data, such as the race/ethnicity of study participants.

PREPARING STUDENTS FOR CAREERS IN POPULATION HEALTH RESEARCH

As population health becomes a more significant public health goal, opportunities will increase for public health experts to collaborate with clinicians and health care administrators and to derive meaningful research questions from those interactions. Students should be taught and given the opportunity to practice selecting, implementing, and evaluating strategies to improve population health.

USING TOOLS OF BIG DATA, VISUALIZATION, AND COMMUNICATION

Students conducting research while in school and after they graduate should acquire skills in big data while understanding that numbers represent individuals' lives, with all the richness of their personal stories. They also should learn how to communicate with different population groups in clear and direct ways marked by cultural sensitivity and humility. This is essential whether researchers, including student researchers, are attempting to enroll individuals in research studies, explaining the meaning of findings or advocating for next steps. Effective communication requires facility with a range of media and channels. No student should graduate from a public health program without facility in using new communication technologies, including social media.

DELIVERING SOLUTIONS

Students should learn how to accelerate the movement of research from inquiry to implementation when proofs of concept are effective. Pasteur said,

There does not exist a category of science to which one can give the name applied science. There are science and the applications of science, bound together as the fruit of the tree which bears it.^{7(p74)}

Students should regard research as a continuum. Each school of public health undoubtedly has examples of wonderful faculty members who have taken discoveries to delivery, and they can be excellent exemplars.

Ideally, while in schools of public health, students should gain skills in the science of implementation and learn the importance of translating effective programs into sustainable practice. (See Donna Spiegelman's overview of implementation science.⁸)

More and more, students want to be entrepreneurs who take solutions to scale by creating social businesses, for-profit companies, and nonprofit organizations. We should help them develop the skills to do so.

BUILDING ON STUDENTS' SENSE OF URGENCY

Students come to schools of public health with the passion to change the world for the better. We should meet their sense of urgency with a parallel urgency to accelerate progress in moving from discovery to application and in achieving measurable,

meaningful, and, ideally, sustainable impact. Urgency grounded in rigorous methods designed to get research answers faster is the ideal way to confront some of the world's greatest health threats and challenges.

Encouraging students to attend to the greatest health risks and threats; to ethics, evidence, and understanding; and to using Big Data tools will help them steer their work toward a public health of consequence. **AJPH**

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