

## An innovative approach for training medical students for the real world of public health

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### Abstract

Although proposals for more public health education go back to 1855, the Institute of Medicine's (IOM) landmark report, *The Future of Public Health* (1988) set the modern stage for reform of medical student education regarding public health. The momentum to improve and increase public health education has grown over the last several decades. The authors present the design of a unique public health clerkship for third and fourth year medical students, the Public Health Field Practicum. Students spend four weeks in an integrated program of public/environmental health activities, coupled with weekly didactic and feedback sessions with the course directors. Ten students have completed the practicum since its inception in March 2007. Significant increases in knowledge, desire to include public health in their medical career, and satisfaction are documented. Students gained substantial insight into public health and how it functions in the real world. This training requires a partnership between schools of public health and medicine and local/state health departments. Medical schools should develop these relationships to provide experiential public health opportunities for their students.

### Introduction

Although proposals for more public health education go back to 1855,<sup>1</sup> the Institute of Medicine's (IOM) landmark report *The Future of Public Health* (1988)<sup>2</sup> set the modern stage for reform of medical student education in public health, and subsequent reports in 2003<sup>3</sup> and 2007<sup>4</sup> developed these ideas in more detail. Important stakeholders in medical education have supported this trend, including the American Association of Medical Colleges (AAMC),<sup>5</sup> American Medical Association (AMA)<sup>6</sup> and American Public Health Association (APHA).<sup>7</sup> The Standards for Accreditation of Medical Education Programs

(May 2010) now include public health science as a biomedical science in ED-11, which stipulates content that must be included in the curriculum of a medical education program.<sup>8</sup> This is a significant advance.

Medical students graduate and become an important part of the Public Health System<sup>2</sup> without understanding what it is, their role in it or without ever having set foot in a public health department. Consequently, physicians practice in the community without having been trained in the community, diagnose conditions that have environmental roots and have no contact with environmental health, and work with or for public health or related agencies without previous agency exposure.

Medical students recognize the inadequacy of their training in public health. In the annual graduation questionnaire from AAMC, 30% rated public health training as inadequate. Coverage of public health subcategories of occupational medicine, environmental health, policy, and disaster management were rated inadequate by 40-42% of students.<sup>9</sup>

The Public Health Field Practicum is one response to this challenge, providing a practice-based clerkship that exposes the student to public health in the real world.

### Innovation

Beginning in 2007, the University of Pittsburgh School of Medicine (UPSOM), in partnership with the Graduate School of Public Health (GSPH) and the Allegheny County Health Department (ACHD), developed the Public Health Field Practicum, a 4 week elective public health clerkship for third and fourth year medical students. The genesis of this course was a convergence of the current course faculty with a movement by UPSOM to improve public health education in the medical curriculum.

The course was designed to highlight the 1988 Institute of Medicine's core public health functions of assessment, assurance, and policy development.<sup>2</sup> In addition, activities were selected to be i) experiential to the greatest extent possible, ii) relevant to the general field of medicine (and thus more likely to intersect with student clinical activities), iii) emphasizing the wide range of public health activities in the broadest possible way, and iv) interlinked with the didactic teaching listed below.

The clerkship provides a hands-on public health experience for students, who spend approximately 80 percent of the four weeks working in the field with a variety of public health professionals and have core and supplementary weekly didactic and feedback sessions with the course directors. The course is designed to emphasize the full range of public health, with special emphasis placed on environmental health which was found in few existing programs in other schools and has a

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history of being overlooked in medical schools.<sup>10</sup> The focus is on integrating the experience into students' current and future medical training and career.

Prior to the beginning of the course, students meet with the course directors to review the curriculum and discuss areas of particular interest. Where possible, the schedule is modified to ensure that the experience includes areas of greatest interest to the student, yet remains comprehensive. Table 1 shows a grid with a typical four week schedule for a student. The field placements ideally involve the stu-

dent being involved in an activity. Students accompany staff on inspections of restaurants, homes, landfills, etc. They often assist with inspections and have first-hand encounters with rats, roaches and sewage. They assist medical staff in clinic experiences and home visits, where possible. For example, medical students have assisted a dentist at a dental sealant clinic. The opportunity to speak with staff provides important insights, even when a field experience is not possible. Students gain a full appreciation for the work of the doctors, nurses, sanitarians and other public health professionals.

In addition to the field experiences, the students participate in structured didactic sessions on topics which include i) public health practice, ii) causation from a public health perspective, iii) the intersection of clinical medicine and public health and how to use this to

your advantage, iv) the legal basis of public health, v) the Ten Essential Public Health Services, vi) the organization of health departments and boards of health, vii) program and strategic planning, viii) the National Public Health Performance Standards, ix) Mobilizing for Action through Planning and Partnerships, x) report and grant writing, and xi) an overview of Allegheny County Health Department's mission, structure, and function. "Translational science" has become very important in research and medicine; students receive didactic instruction, discussion with course directors, and write a short paper on translational applications based on their own research or experiences.

The biggest challenges have been i) funding for development and ii) difficulty in "repaying" local public health department staff for their time.

## Evaluation

Ten students have completed the practicum (UPSOM catalog # MSELCT 5858) since its inception in March 2007, for an average of 3 per year. Participating students bring varying degrees of previous experience in public health. Two had worked in public health agencies and one already had an MPH. Students have gone on to residency in internal medicine (4), psychiatry (2), pediatrics (2), and emergency medicine (1). One is still in school.

Students create a written evaluation for each individual experience, write a weekly report, and fill out a pre/post learning assessment and overall course evaluation. In addition, at the end of the practicum students create and present a seminar which summarizes their experience, including their observations and insights into how this fits into their medical education and future medical practice.

**Table 1. Typical practicum schedule.**

Monday	Tuesday	Wednesday	Thursday	Friday
Day 1 AM: orientation PM: Child death review	Day 2 Didactic sessions	Day 3 Community care behavioral health	Day 4 Housing and community environment	Day 5 Didactic sessions and Weekly wrap-up
Day 6 AM: Childhood lead poisoning prevention proj PM: Vector Control	Day 7 Water quality	Day 8 TB clinic with pulmonary fellows	Day 9 AM: Immunization clinic PM: AIDS clinic	Day 10 Didactic sessions and Weekly wrap-up
Day 11 Food protection and restaurant inspections	Day 12 Healthy start, inc.	Day 13 Maternal and child health	Day 14 Epidemiology	Day 15 Didactic sessions and weekly wrap-up
Day 16 Dental clinic and outreach	Day 17 Allegheny correctional health services and jail	Day 18 Air pollution	Day 19 WIC	Day 20 Seminar presentation and final wrap-up

Other choices that may be available, based on student interest and availability, are: Allegheny County Health Department chronic disease and/or traffic safety programs; Three Rivers Wet Weather, Inc; Allegheny County Sanitary Authority; Family Services of Western Pennsylvania; Allegheny County Behavioral Health; Allegheny County Children Youth and Families; and, Allegheny County Medical Examiner.

**Table 2. Reflections of students from the public health field practicum.**

Patients spend an hour with me. They spend a lifetime in the community. It is obvious to see which one would have a bigger impact on their health.

This experience overall has...been a good exposure to the breadth and diversity of public health. It's really neat that we actually had a chance to...see what public health does, and not just read about it in a book.

When I first thought about public health, I was kind of clueless. But I realized that public health looked a little bit beyond what I saw in the clinics or in a hospital setting. Often times we've been trained to look at the disease, we diagnose it and then we treat it, and then the patient goes off and that's the end of the story. But public health sees the teacher, the engineer, the student in the community. They see McKeesport, they see the rural outskirts of Allegheny County, and they see pretty much the whole overall picture that often times the medical profession misses.

This kind of immersion is really the best way to get the point across.

My experience with this course was valuable because it was so varied...Coming from a public health background, this course has helped me to refresh some of my basic public health knowledge as well as learn how to incorporate public health work into my medical career.

I became interested in the practicum because of a limited personal understanding of what public health really meant...As well, my medical school training was mainly restricted to the clinic and hospital settings. The breadth and diversity of experiences increased my awareness of the interface between health care professionals and patients. It was also fun to get my feet wet out in the field while observing a preventative as well as holistic approach to health. Since this experience, I am continuing my training in general internal medicine with an interest in underserved and primary care medicine... I hope to continue to refine the skills I have gained from the practicum to effect change at a community level.

I chose the public health elective to pursue my interest in helping underserved and underrepresented patient groups. On every rotation, I see patients whose environment is slowly killing them, whether through toxins or disease vectors or failure to provide basic "life support" services. As a physician working in an office, I can advise them until I'm blue in the face, but these patients have little political or economic power to change their circumstances. Public health agencies are the best hope for bringing them the help they need.

I realized that an enormous amount of time and energy is needed to realize the change in patients' behaviors necessary to improve their lives, things that medical professionals try to remedy with a social work consult or a glib referral! Also, being out in the field, I was able to see how under-funded these agencies are but impressed at how they increase their efficiency by putting other people to work, such as how they vector control division educates local agencies on how to lower the mosquito population.

Student satisfaction with the experience and learning outcomes are high. The students complete a general evaluation of the course and a pre/post learning assessment. On a Likert scale of 1=*Poor* to 5=*Excellent*, students rated the course an average of 4.5 overall. All students reported being "more interested" in careers in public health as a result of the experience. Three planned to obtain MPH degrees.

At the beginning and end of the course, students are given a standard pre/post assessment of knowledge. Students are asked about their knowledge/experience of approximately 14 subjects, based on their individual field placements (See Table 1 for typical placements.). These are scored on a 5-point Likert scale of 1=*Nothing*, 3=*Basic Knowledge* and 5=*Proficient*. Collectively there was an increase in each of the 14 areas. Summing all areas, pre/post learning increased from 2.78 to 4.03, or a change of +1.25, which was significant both in scale and statistically ( $P < 0.0001$ ; t-test, assuming unequal variances).

Students may also reflect the success of the program in additional ways. One student wrote an opinion/editorial to the local newspaper in response to criticism of the local health department. His published article stated, in part, "the problem is not that Dr. Bruce Dixon or his staff lacks a commitment to our health; it is that generations of county leaders have failed to make the investments needed to ensure our future safety. I hope that [the county official] will use this as an opportunity to make good on his rhetoric and find the funding our Health Department deserves."<sup>11</sup> Finally, the authors ask the students to describe what is best about this elective and in what ways the course helps them to become physicians better able to integrate public health with medical concepts and roles, and to be a bridge between these disciplines in their future careers. Their responses, shown in Table 2, reflect insight and enlightenment with regard to public health, medicine, and their training as physicians.

### Limitations

A limitation of these findings is that the

students are a self-selected sample. They take the public health clerkship because they are interested, so are more likely to be positive about the outcome. This is reinforced by the reaction of the course mentors, who universally note the enthusiasm and high level of interest of the students. This result is also limited to the United States, Canada and other countries using the Flexner model of medical school education. This course is broad but not deep, and can only represent one component of a comprehensive public health education. Finally, it is limited in the number of students because health department and other agency staff can only accommodate a few students at a time in the current structure.

### Conclusions

Courses such as the Public Health Field Practicum are essential for medical students. They provide a unique opportunity for students to experience the world of their patients as an essential part of their training. MSELCT 5858 is possible because of an advantageous set of circumstances, with existing connections between UPSOM, GSPH, and ACHD. These relationships are integral to effective functioning of the Public Health System as defined by The National Public Health Performance Standards Program.<sup>12</sup> The authors recommend that all medical schools explore the creation of these opportunities and relationships where they do not exist and the development of similar clerkships.

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