Integrating Population Health Into a Family Medicine Clerkship: 7 Years of Evolution

Mark Unverzagt, MD; Nina Wallerstein, DrPH; Jeffrey A. Benson, MD, MPH; Angelo Tomedi, MD; Toby B. Palley, MD

A population health curriculum using methodologies from community-oriented primary care (COPC) was developed in 1994 as part of a required third-year family medicine clerkship at the University of New Mexico. The curriculum integrates population health/community medicine projects and problem-based tutorials into a community-based, ambulatory clinical experience. By combining a required population health experience with relevant clinical training, student careers have the opportunity to be influenced during the critical third year. Results over a 7-year period describe a three-phase evolution of the curriculum, within the context of changes in medical education and in health care delivery systems in that same period of time. Early evaluation revealed that students viewed the curricular experience as time consuming and peripheral to their training. Later comments on the revised curriculum showed a higher regard for the experience that was described as important for student learning.

(Fam Med 2002;34(10):45-51.)

In the preceding decade, medical educators witnessed the emergence of "population health" as an educational priority in the curricula of many schools of medicine. The amount of student exposure to population health, the specific content of the curricula, the extent of its integration with more-traditional biomedical pedagogy, and the timing of its introduction vary widely from institution to institution. Evaluation of these new efforts is, therefore, inherently difficult, raising the importance of understanding the forces behind the curricular change.

This heterogeneity in the population health curricula for medical students across the country can be attributed in part to variation in the impetus for its implementation. A variety of forces may be involved, including the crisis in health care costs, growth in uninsured populations, reorganization of medical practice, and the growing recognition of societal forces that influence people's health. All of these factors may foster the introduction of population health into medical education curricula. Other factors that have hindered or fostered an interest in population health medicine in academic centers across the country include self-image of the medical school (e.g., either research or practitioner oriented), receptivity to community medicine by leaders in the academic health center, and pressures from the local community for more community-oriented service.

Educational efforts in population health started in the 1960s, often by introducing community-oriented content in the preclinical years as lectures or tutorials or as electives during clinical clerkships. In the last 2 decades, philanthropic organizations, such as the W.K. Kellogg Foundation, Robert Wood Johnson Foundation, Rockefeller Foundation, and the Pew Charitable Trusts, made large grants to assist academic medical centers in integrating community-oriented public health instruction and service learning into medical school curricula. A commitment between the American Medical Association (AMA) and the American Public Health Association to integrate medicine and public health was yet another impetus.

Population health as a discipline has emerged recently as a formal integration of evidence-based clinical medicine and public health sciences in the care of populations, rather than just of individuals. Academic health centers have begun to value community-based education, which is designed as the location of clinical services administered by the institution outside the campus and in local communities. In addition, they have begun to embrace community-oriented learning in which students learn about and in turn provide some-
thing to the communities in which a service delivery system is located.

**The Primary Care Curriculum**

During this same extended period of time, the University of New Mexico (UNM) School of Medicine was experiencing the effects of these changes. With support from the W.K. Kellogg Foundation, the UNM School of Medicine had by the 1980s developed curricula in problem-based community-oriented learning for the preclinical years within a separate educational track, called the Primary Care Curriculum (PCC).\(^{16}\)

Begun in the late 1970s, PCC was an alternative track selected by close to one third of entering medical students. PCC offered problem-based, small-group tutorial learning in the preclinical years as an alternative to the traditional lecture-based classroom approach. PCC also offered early and repeated exposure to clinical work in the communities of New Mexico. A Health of the Public (HOP) grant in 1987 extended public health innovations into the clinical years.\(^{17}\)

In 1993, the PCC, the traditional track, and HOP were merged into a single curriculum. All medical students are now involved in problem-based tutorial learning and have early exposure to clinical medicine delivered in community settings. An enhanced emphasis on population health throughout the educational process is a hallmark of the newly integrated curriculum. Biopsychosocial models of health and disease became the cornerstone of didactic and problem-based instruction. The clinical years were also reorganized to focus on ambulatory primary care during the third year, which provided an opportunity for additional population health learning experiences.

**The Practical Immersion Experience**

One of the components of this new curriculum was a mandatory experience in rural or other underserved communities known as the Practical Immersion Experience (PIE), which is still operational today. The PIE is supervised by the School of Medicine and is not a departmental activity. It is undertaken between the first and second years of medical school and consists of student placement for up to 12 weeks in one of the many clinic sites. These sites are the practice sites of volunteer clinical faculty working throughout the state of New Mexico.

In addition to clinical time in a preceptor’s office during PIE, medical students are required to do a community project. This community project involves an assessment of community health problems and the resources that the particular community has (or does not have) to help meet these problems. The PIE experience is not graded, but all components—including community medicine—must be satisfactorily completed to receive credit. The basic structure of PIE, while not tied directly to the third-year family medicine clerkship, is built on during our clerkship’s population health experience.

**Family Medicine’s Population Health Experience**

To augment these early community-based experiences, in 1994, the UNM Department of Family and Community Medicine created a community-oriented population health curriculum that was implemented as a required component of the third-year clerkship. In the subsequent 8 years, many of the forces that helped inspire this type of curriculum change have waxed or waned in influence. However, this community-oriented population health experience remains central to the clerkship and is the subject of this paper.

This article presents a description of the evolution of this population health experience through three major phases of its implementation, along with an evaluation of the curriculum. The changes in this curriculum are examined as a function of the external forces that have helped to define and shape it, as well as a response to the evolutionary force of student and faculty evaluations over the curriculum’s history.


As a result of the forces within the School of Medicine described in the preceding paragraphs, combined with a departmental philosophy within the Department of Family and Community Medicine that placed value on public health and community service, a population health curriculum integrated within the 8-week family medicine ambulatory clerkship was begun in 1994. This population health curriculum, known as the “community project,” became an integral part of the clerkship. The structure of the clerkship, which has remained unchanged since its inception with the introduction of the new medical school curriculum, is an exclusively outpatient rotation with an assigned family medicine preceptor within the Health Sciences Center or surrounding Albuquerque community. Fifty percent of a student’s time is spent in the clinics with the preceptor. The population health component is carved out of the remaining 50%, as are problem-based tutorials and home visits.

The orientation of the community project population health curriculum invoked the community-oriented primary care (COPC) model, but its implementation was experiential. Implementation involved the use of “teachable moments” by having students define a population health issue from their clinical encounters during the first few weeks of the rotation. The students were then asked to develop a community project based on this health issue. Prior to project initiation, students were presented with an introductory presentation on the five steps of COPC,\(^ {18}\) as well as on basic epidemiologic and public health concepts, such as how to characterize populations, plan a project based on their iden-
Examples of Medical Student Projects

**Assessment**
- What are our children eating? A nutritional assessment of Albuquerque high school lunches
- Monkey bars, glass, swings, graffiti and kids. An assessment of physical and social safety disparities among four quadrants of different social economic status (Albuquerque)
- Prevalence of myths regarding sexuality, pregnancy, and contraception among early adolescent focus groups and proposed intervention (middle school, school-based health center)
- Pneumococcal vaccination coverage among persons ages 65–74 years in Dona Ana county.
- Health beliefs and diabetes in Native Americans (interviews of patients conducted in Navajo and English, rural clinic, Cuba, NM)
- An assessment of gun violence, accessibility, and safety (Las Vegas, NM)

**Interventions**
- Overcoming limited financial access to medications in rural Mountainair, NM
- Implementation of a violence prevention program at Albuquerque High School
- *Mi hijito/mi hijita* (comprehensive infant/toddler-parent mental health program in rural Northern New Mexico clinic)
- Implementation of a diabetes education program in Cuba, NM (Navajo and Hispanic patients in rural clinics)
- Tar Wars: presentations on smoking hazards for elementary school children (elementary school teaching in Albuquerque)

Table 1

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<th>Examples of Medical Student Projects</th>
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**Curriculum Design Changes for Phase II**

The developments related to the growth of managed care resulted in the first major evolutionary change in the population health curriculum—new faculty with expertise in community medicine/public health were hired. The new clinical faculty were based in the new community-based sites and were charged with the teaching and coordination of the community project. As a result, the new preceptors and new off-campus clinical sites became the primary locus for all project activity. The university-based faculty took on a consultant’s role for both the students and the new off-campus preceptors, who did not have much public health or community medicine experience. University-based faculty continued to mentor students through four regularly scheduled community medicine tutorials,
during which they discussed project methodology and progress.

The second major change was based on student feedback from Phase I. The students had told us that implementing all stages of a COPC process was too frustrating and difficult to complete during the time span of a clerkship rotation. Rather than a project that addressed all five components of COPC, therefore, students in Phase II were asked to choose only one component of COPC for their 8-week project. This change significantly reduced the scope and amount of work expected from the students during the 8 weeks.

**Evaluation of Phase II**

Evaluation of Phase II was performed using the same evaluative tools as Phase I. The mean score for community medicine projects dropped slightly from 3.1 to 2.84, with clinical practice component remaining at 3.7. Tutorials also dropped—from 3.2 to 3.0. Eighty-nine percent of students received good to outstanding grades, a slight increase over Phase I.

Qualitative comments indicated a significant drop in student satisfaction. Only 21% were wholly positive, while 42% were mixed positive and negative, and 37% were negative. Many of the negative comments revolved around time commitments, as well as anxiety about the grading of the experience. Students commented in particular about the unavailability of funding for project work. Although students had experienced greater completion rates of their projects because of the more limited scope, their comments raised faculty concerns and drove major changes in the curriculum during Phase III. Examples of projects from Phase II are shown in Table 3.

**Phase III: Student-directed Evolution (1999–Present)**

By the end of the last decade, several initiatives in population health created a stronger base for this discipline within medical schools across the country. In 1999, the Association of American Medical Colleges (AAMC) released the Medical School Objectives Project (MSOP), which proposed informatics and population health objectives.19 and the Association of Teachers of Preventive Medicine developed core preventive medicine competencies for medical students.20 In addition, a Medicine/Public Health Initiative was sponsored by the AMA and the American Public Health Association,21 evidence-based medicine curricula were being developed,22 the Liaison Committee for Medical Education affirmed that accreditation standards should include population health experiences,23 and social responsibility curricula and social contracts between AHCs and their communities were proposed.24–27 A recent survey of medical schools, however, showed only 60% engaged in educating students in the community dimensions of health care, though greater attention was paid to clinical prevention and quantitative skills content.28 The largest gap noted was the limited expansion of population health educational requirements into ambulatory clinics in the second 2 years of medical school, which are critical years for medical student career choices.

**Table 2**

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<th><strong>Student Comments</strong></th>
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<td><strong>Positive Comments</strong></td>
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<tr>
<td>It was an eye-opener for me. I saw another dimension of medicine.</td>
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<tr>
<td>The community project allowed me to give something back to my preceptor and an opportunity to see a small part of the challenge of approaching a community you are not from.</td>
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<tr>
<td>Really interesting and fun—great learning experience to explore populations that used public health intervention . . . a nice introduction to public health.</td>
</tr>
<tr>
<td><strong>Positive But Time-consuming Comments</strong></td>
</tr>
<tr>
<td>Difficult to complete in 8 weeks. Fun. Good learning experience.</td>
</tr>
<tr>
<td>Good tool to get involved with community. Is 2 months time sufficient for big project?</td>
</tr>
<tr>
<td>Involved more work than I had planned, but I learned the value of COPC. Overall I think it is a good idea.</td>
</tr>
<tr>
<td><strong>Mixed Comments</strong></td>
</tr>
<tr>
<td>Stressful but interesting. It is a great concept. I did find it distracting but as I got into the project it helped me to understand my community better.</td>
</tr>
<tr>
<td>At first I was quite skeptical about this but as it turned out, it was kind of fun, useful, and not as much a pain as I thought it would be.</td>
</tr>
<tr>
<td>Even though I was against this in the beginning, I felt a greater sense of appreciation and accomplishment in writing the COPC.</td>
</tr>
<tr>
<td><strong>Negative Comments</strong></td>
</tr>
<tr>
<td>Difficult to understand what is expected of student.</td>
</tr>
<tr>
<td>A time-consuming requirement without usefulness except to introduce us to a new way to look at research.</td>
</tr>
<tr>
<td>I would have rather had the concepts presented in lecture and written form and then used the rest of my time in seeing patients in clinic.</td>
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**Table 3**

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<tr>
<th><strong>Examples of Projects From Phase II</strong></th>
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<td><strong>Project Title:</strong> &quot;Development of a Diabetes Education Program for the Checkerboard Area Health System.&quot; A new continuity clinic with a new faculty member developed diabetes education programs for the Navajo community. Other student projects in diabetes screening, control, and cultural relevance evolved out of this project.</td>
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<td><strong>Student Comments:</strong> “It’s difficult to develop a project at a site where none had been started.” “I liked not having the pressure of completing the entire COPC process.” “Maybe could be modified to one-page paper . . . on how [students] were involved.”</td>
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<tr>
<td><strong>Faculty Comments:</strong> “The community project greatly aided our community in being selected as the site for a new rural outreach program.”</td>
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Because of the market peculiarities in Albuquerque and the models of population health curricula used at UNM for more than 2 decades, the substantial momentum these forces created at UNM were ahead of trends for the rest of the country. During this later phase, therefore, the strongest influence on the development of UNM’s curriculum was the cumulative effect of more than 4 years of experience and student evaluation.

Curricula Design Changes for Phase III

Changes in the curricula during Phase III were based primarily on the qualitative comments that students made about Phase II. Based on student and faculty feedback during Phase II, grades were no longer assigned to projects. Project work became pass/fail, and 100% of students passed. The five- to seven-page COPC paper and project summary were eliminated and replaced with a one-page summary of relevant COPC work. In addition to this written summary, a student-developed poster was presented at the end of the rotation at the departmental grand rounds. Faculty were successful in obtaining some funding to provide seed money to support some student projects.

In addition to internal structural changes to the course, by Phase III, the preceptors who were new in Phase II had begun to develop their own projects in which students could participate. With preceptors able to establish continuity between projects, students could build on each other’s work. Time demands were reduced since students did not have to spend up-front time creating their own projects. They began to feel more strongly that they were addressing actual needs of the communities in which their clinics were located. In addition, they still were able to choose a piece of the overall project that reflected only one step of the COPC process, and they had to produce less documentation for UNM faculty.

Evaluation of Phase III

After Phase III changes were made, students’ qualitative comments indicated improvement in satisfaction with the experience. Of the 84 student comments, 62% were wholly positive, 5% were positive but expressed concern about the time-consuming nature of the community projects, 10% were mixed, and 14% were negative. These evaluations indicated that curricular changes had made a difference in students’ acceptance of the community medicine project.

Quantitative scores continued to reflect students’ greater interest in clinical ambulatory care than in the community medicine projects. During Phase III, we adopted a 5-point Likert scale instead of the 4-point scale used previously. On the 5-point scale, clinics were rated higher (at 4.1) than community medicine projects (3.3). Scores for the community project declined during Phase III after introduction of the 5-point Likert scale. This decline might have been a function of the scale now having a “middle” option, though it also could reflect a decline in students’ evaluation of the experience itself.

While community preceptors have never been asked directly to evaluate their students’ community projects, those who have commented have appreciated students’ contributions to addressing community health problems. As one provider said, “The student did a superb review of the problem of teen pregnancy among some of my patients that the providers will be able to use to improve their services.” Occasionally, student projects have led to new grants or services. One preceptor commented, “The community project greatly aided our community in [developing a program] to aid new parents learn parenting skills and have a support group.”

Discussion and Lessons Learned

There were significant changes made in the curriculum over the 7 years, starting from ad hoc student projects that attempted to complete all stages of the COPC project to a more defined and preceptor/faculty driven set of existing projects. The latter project format allowed students to join an existing project and build on each other’s work. Grading was eliminated, and written documentation of project work was significantly reduced. Guidance of students by academic faculty remained a feature of the curriculum, and preceptor experience in community medicine grew along with the curriculum evolution.

For this article, we reviewed the evaluations by 322 students (90% of all students) who took the 8-week family medicine rotation, from April 1995 until August 2001, with major changes in the curriculum occurring after Phase II. Based on the results of our evaluation, it appears that by Phase III, student resistance to community projects had declined, and faculty and student comments have trended toward a more positive description of their learning during the community medicine project. Based on the cumulative evaluation and the 7 years of experience in implementing the curriculum, the following represent specific lessons learned about how best to integrate a population health curriculum into a clinical primary care ambulatory clerkship.

COPC model is difficult to implement/learn in an 8-week clerkship. The COPC model, when used as the basis for clerkship activity in population health, was difficult for students to fully implement in the short duration of a clerkship. End-of-rotation comments to faculty during Phase I clearly articulated that students’ stress levels were quite high when they were expected to develop and implement a full COPC project during an 8-week block. COPC work often can take years to “bear fruit.” Modifying the curriculum to use COPC as a framework for established projects improved the
faculty's ability to teach an important component of population health and made the practical experience more enjoyable and meaningful for students.

Defining and harnessing institutional assets can facilitate curriculum success. Building and refining this curriculum took advantage of select "institutional assets" already present within the Health Sciences Center. Early innovations in the School of Medicine that began in the 1970s, coupled with a philosophical commitment to community health within the Department of Family and Community Medicine, helped foster the creation of this clerkship. The growth of primary care departments and the institution's renewed emphasis on primary care services in external clinics with geographically and culturally defined communities were responsible for its evolution and refinement. Recognizing what institutional assets are available to curriculum planners and then building on relevant ones is critical for the success of innovative curriculum design and implementation.

Designating faculty with expertise and interest in community medicine and population health to develop projects and mentor students is essential for the provision of valuable learning experiences for students and for meaningful change to arise from project activities. In Phase I of our curriculum, we lacked sufficient faculty support for project activities and didactic teaching. With the expansion of the departmental faculty who worked as preceptors in community-based teaching clinics during Phases II and III, coupled with additional support over time for external preceptors to understand their role in supervising student projects, meaningful projects were finally developed. As these faculty members and preceptors took the lead on projects in their own sites in external clinics, students were relieved of the burden of finding project work, and communities became long-term partners in many projects. Faculty/preceptors were able to become role models for how to integrate public health into clinical practice. This integration of population health teaching and clinical experience has become increasingly important for both education and service.

Paying attention to a variety of mechanisms for feedback is essential to responding to students' evaluations of their experience. While several factors drove curriculum changes, such as expansion to external ambulatory sites and greater use of external preceptors, the summary of evaluations suggests the importance of incorporating students' perceptions of the learning experience and recommendations for change. Student appreciation for and sense of importance of curricular goals and objectives increased as their suggestions were incorporated. The utility of students' qualitative comments were considered more important than the quantitative ratings. With clinical experiences consistently rating higher than the community medicine project, faculty understood that third-year medical students might prefer the clinical patient interactions but were satisfied that the community medicine project had a sufficiently favorable response as well. As a formative evaluation tool, qualitative comments provided specifics for planning and implementation of important changes within each phase.

Measuring the long-term effect of the curriculum is difficult but should be undertaken. While we have been successful at meeting short-term objectives of the curriculum, evaluation of the long-term effect of our community medicine experience has not been implemented. For example, we do not know if the experience has an influence on career choice, willingness to incorporate population health principles into future clinical practice, orientation toward communities and community health, or on a community's health. However, a recent study of the association between future physician involvement in community and a medical school experience similar to that at UNM documented a significant increase in physicians' community activities, including pursuing relevant community-based training, having a mentor active in the community, and rotating in rural or underserved locations.29 Evaluation of both short- and long-term effects clearly remains a challenge and is critical if future initiatives in the medicine/public health arena are to continue successfully.

Acknowledgments: Much appreciation to Robert Rhyne, MD; Arthur Kaufman, MD; and Savetio Sava, MD for editing, and many thanks to Dan Gonzalez for compiling the student evaluation data.

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REFERENCES