



ASSOCIATION FOR PREVENTION TEACHING AND RESEARCH

EVALUATION OF PREVENTION EDUCATION
IN U.S. MEDICAL SCHOOLS:
A Status Report

Introduction

Significant changes in the healthcare system and expectations of consumers have begun to influence medical education in the United States. Many medical schools are undertaking thorough assessments of the content of their predoctoral and postgraduate curricula to better prepare physicians for the future.¹ Educators are recognizing that physicians will need to be prepared to provide population-based preventive health care as well as high quality medical care to individuals. While this shift has been perceived by some as dramatic, others see the linkage between medicine and population/public health as essential if we are to provide the highest quality health care possible to the U.S. population. This latter view is reflected in the recommendations endorsed by the Association of American Medical Colleges (AAMC) in its report on population health.²

Recognition of the importance of teaching prevention is not new. In 1945 the AAMC recommended that each medical school establish a Department of Preventive Medicine.³ More recently, an expert panel convened by the Association of Teachers of Preventive Medicine proposed curriculum requirements in prevention using the *Guide to Clinical Preventive Services* “to achieve the goal of making preventive medicine an integral part of the education, training, and practice of physicians”.⁴ Despite these initiatives and the amount of evidence that exists supporting the value of preventive care, the integration of prevention into medical education has been neither rapid nor easily achieved.¹⁻⁶

The Association of Teachers of Preventive Medicine (ATPM) decided to address the need for more education about prevention in medical schools by establishing the Prevention Curriculum Assistance Program (PCAP). This initiative, jointly funded by the ATPM and the Health Resources and Services Administration (HRSA), began in the fall of 1994. The PCAP was created to achieve two primary goals: (1) to help U.S. allopathic and osteopathic medical schools examine the extent to which they are evaluating the learning of medical students about disease prevention/health promotion principles and their applications, and (2) to develop a network whereby medical schools seeking to improve their prevention education and evaluation methods can obtain assistance from institutions willing to be a resource for others.

History of the PCAP

The concept for the PCAP arose with recognition that more needed to be done to help medical schools improve the quality of their teaching and the evaluation of students' learning about prevention. In November 1994, the ATPM Board of Directors allotted funds to begin the program. The first step was to design, test, and distribute to all U.S. allopathic medical schools a prevention education needs assessment instrument. The purpose was to acquire information from medical educators that would guide the development of a program of greatest utility for educating medical students about prevention. The process of designing and testing this needs assessment questionnaire was undertaken by the Survey Research Facility at the Medical University of South Carolina.

The final version of the questionnaire was distributed by telephone facsimile (fax) to the curriculum deans at 125 U.S. medical schools. Ninety-one (91) responses (73%) were received. Over 80% of the respondents acknowledged there was a need for more prevention education in their medical schools. Over 70% expressed an interest in utilizing a prevention self-assessment inventory to compare their prevention curricula with a recommended national standard. Based on the results of this needs assessment, the Prevention Self-Assessment Analysis (PSAA) was created which incorporated many of the recommended curriculum content areas contained in the "Inventory of Knowledge and Skills Relating to Disease Prevention and Health Promotion."¹ ("The Inventory")

The "Inventory" was revised for this project in 1995 to incorporate current prevention education content objectives thought to be essential for all medical students prior to graduation. In July 1995, a national conference was held entitled "Prevention in Medical Education for the Year 2000". The conference chairperson, William Wiese, M.D. presented the following challenge to attendees: "Leaders in medical care services and medical education are now called upon to examine the teaching of prevention in order to assure that graduating physicians have the basic knowledge, skills, and attitudes with respect to how prevention will be practiced in medical care at the start of the new century." This conference validated the importance of proceeding with the PCAP initiative and, specifically, with the distribution of the PSAA.

The PSAA instrument was developed by the investigators with input from an advisory panel of medical educators. The PSAA consisted of 37 questions divided among the four sections of the "Inventory." (Table 1). In October 1996, the PSAA was reviewed by the prevention leaders at six additional medical schools for clarity, ease of use and appearance. Two co-authors (DG, DL) met on-site with faculty who completed the PSAA to obtain their feedback. The instrument was revised one last time in preparation for its national distribution.

One of the key concerns about distributing the PSAA was to make sure that it reached the appropriate people at each medical school. The investigators used databases from the Association of American Medical Colleges and ATPM in an attempt to identify the curriculum and prevention leaders on each campus. In April 1997, the PSAA was mailed to all 125 allopathic medical schools and, in October 1997,

to all 19 osteopathic medical schools. This manuscript presents the results from the PSAA and a discussion about where attention might need to be focused in the future to better address the prevention education needs in U.S. medical schools.

Results

Ninety-eight (98) completed surveys were received. The 88 completed surveys from the allopathic medical schools represent a 70% response rate; ten (53%) of the osteopathic medical schools returned surveys. The combined information derived from the completed surveys provides useful insight into the status of prevention education and evaluation. The following are some of the highlights from the completed surveys:

Clinical Preventive Services

- Ninety-six percent (96%) of respondents expect medical students to be able to identify the screening tests, prevention counseling, immunizations, and chemoprophylaxis for which people are due. Ninety-one percent (91%) expect students to have the skills to provide these four categories of preventive services to patients. Ninety-four percent (94%) indicate that they measure the students' competence in these areas. Written tests and unstructured observation are the two most commonly used methods for evaluation; less than one-half of respondents use standardized performance-based assessment such as OSCEs (Objective Standardized Clinical Evaluations) as part of their evaluation program.
- Only 31% of all respondents indicated they were satisfied* with the quality of the outcomes evaluation they were employing to assess students' abilities in clinical preventive services.
- An average of 41% of all respondents expressed a desire to receive assistance with designing their prevention curricula and/or evaluation methods relating to clinical preventive services.
- Twenty-three percent (23%) of respondents indicated that they or their faculty colleagues would be willing to help those at other schools design curricula and/or measurement strategies within the area of clinical preventive services.

Quantitative Methods

- Over 90% of respondents indicated they expect their students to achieve competence in 7 of the 10 skill areas in the quantitative methods section of the survey; depending on the specific question, between 68 - 88% of all respondents indicated that they measure students' competence in the particular area.

- Two skills were viewed as being less important. Fewer than 55% of all respondents expect students to be able to: (1) describe the principles and values of a cost effectiveness analysis, and (2) identify and interpret the basic elements of a decision tree.
- Depending on the skill area being evaluated, written tests were employed 80 - 97% of the time to assess students' competence in managing information relevant to quantitative methods. Unstructured observation was used 20 - 30% of the time.
- Forty-nine percent (49%) of respondents were satisfied with their outcomes evaluation methods in this area.
- A mean of 37% of all respondents were interested in receiving assistance with designing their quantitative methods curricula and/or evaluation systems.

* "Satisfied" was the category to which respondents were assigned who recorded either a 4 or 5 on a 5-point Likert scale with #5 classified as "very satisfied."

- Thirty-three percent (33%) of respondents expressed a willingness to assist other schools in teaching quantitative methods and evaluating students' knowledge in this area.

Community Dimensions of Medical Practice

- Depending on the specific content area, between 40% - 86% of respondents expect students to achieve the objectives contained in the "Community Dimensions" section of the survey. The highest percent responses were to the outcomes relating to two areas: an appreciation of the effect of language, culture and style on provision of health care services, and the ability to identify community resources to complement individualized care. The lowest responses were to the questions relating to risk factors both for individuals traveling abroad and for immigrant populations.
- Of special note, fewer than 60% of all respondents expect students to be able to describe how to "implement community-responsive, population-based health care."
- A mean of seventy-six percent (76%) of all respondents indicated that they actually measure students' competence in the "Community Dimensions" content areas. Unstructured observation and written tests are the evaluation methods utilized most frequently.
- Only 21% were satisfied with the quality of their evaluation methods.
- An average of 46% of respondents would like to obtain assistance with methods to teach and/or evaluate learning within the area of "Community Dimensions."

- Seventeen percent (17%) of respondents said they would be willing to assist other medical schools with teaching and evaluation methods in the content area of "Community Dimensions."

Health Services Organization and Delivery

- Between 56% - 80% of respondents expect students to achieve the objectives included in this section. The highest response was to the question relating to students being able to describe the basic principles of governance and regulations of the medical profession. Only 56% of respondents expected their students be able to describe methods used to assess the quality of health care services to individuals and populations.
- Of those who do expect the students to learn the content within the area of "Health Services Organization," only 72% actually evaluate the learning of the students.
- Depending on the specific question, written tests were employed between 66 - 85% of the time to evaluate students' knowledge about health services. Unstructured observation was cited an average of 33% of the time as the second most commonly used evaluation method.
- An average of only 12% of all respondents were satisfied with the outcomes evaluations they employed. No respondent indicated they were "very satisfied."
- An average of 49% of respondents would like to receive assistance either with curriculum design or evaluation methods in this area.
- Only 10 respondents indicated their willingness to assist other schools with teaching health services organization and delivery.

Comparisons across Content Areas

When comparing trends across the four areas of the "Inventory," Figure 1 shows that the majority of schools responded that they expect students to achieve measurable outcomes in each of the four content areas. However, substantially more schools expect their students to acquire expertise in clinical prevention and quantitative methods than in either community dimensions or health services. Likewise, slightly more schools reported that they are currently measuring outcomes in the former two content areas than in the latter two (Figure 2).

When asked to identify specific methods used to measure competence, "written tests" was the response recorded by the majority of respondents in each of the four areas. "Unstructured observation" followed with over 50% reporting use of this technique when evaluating students' learning of both clinical preventive services and community dimensions of medical practice. Standardized performance-based assessment was used by 25% of respondents for measuring outcomes in clinical prevention and

by fewer than 12% of respondents to measure student competence in the three other content areas of the "Inventory."

Satisfaction with current measurement techniques varied across the four content areas and was not associated neither with either currently measuring competence nor with requesting assistance with designing measurement strategies (Figure 3). Only 25% of the respondents indicated they were satisfied with outcome evaluation methods in at least two of the four content areas. One hundred percent (100%) of respondents who indicated they were not satisfied with outcomes measurement in two or more areas indicated that they would like assistance in at least one of those areas.

Discussion

The results from the PSAA give rise to valuable information pertaining to the education of medical students about prevention and the evaluation of their learning. This discussion will sequentially address each of the four sections of the PSAA and the issues that arise when analyzing the data.

Clinical Preventive Services

The responses to the "Clinical Preventive Services" section of the survey clearly verify that faculty expect medical students to achieve these preventive competencies. The vast majority of respondents agree that the knowledge and skills relating to clinical preventive services are important.

Of concern, however, is that written tests and unstructured observation are the methods used most often to evaluate the learning of students. Yet, of the four sections of the PSAA, the area of clinical preventive services is most amenable to objective evaluation using methods such as OSCEs. Simply knowing what needs to be done to counsel patients about preventive care is only part of the challenge. The other vitally important aspect is to prepare students who possess the skills to effectively utilize clinical preventive approaches in the care of their patients. Helping people develop and maintain healthy behaviors is one of the great challenges for physicians. Medical schools need to assess how competent their students are at incorporating prevention into clinical care. In addition, medical schools need to establish the infrastructure that will enable them to incorporate more extensive performance-based evaluations into their curricula. It would be desirable for medical schools that have created effective standardized performance-based assessments to share their materials and approaches with institutions that seek to improve the quality of their evaluation methods.

The need for the investment of resources and expertise in the evaluation of students' abilities with clinical preventive services is verified by the fact that only 31% of all respondents were satisfied with the quality of their outcome evaluations. Clinical preventive services is presently, and will remain, an important part of the work of physicians. The results of this survey indicate that more needs to be done to assure that future physicians are adequately equipped with the skills required to help people take optimal care of their selves.

Quantitative Methods

Most respondents indicated that they expect their students to achieve competence in most of the areas listed in the "Quantitative Methods" section of the PSAA. Fewer medical schools actually evaluate the competence of students in this area when compared with the questions relating to the evaluation of knowledge and skills in clinical preventive services. It is interesting that barely half of the respondents expect students be able to understand the principles of a cost effectiveness analysis and to be able to utilize a decision tree. In light of the changes occurring in health care, vis-à-vis cost and evidence-based principles, it is concerning that these two areas are receiving less attention than they probably deserve.

The respondents to the "Quantitative Methods" section recorded the highest degree of satisfaction with their outcomes evaluations methods. This section also had the largest number of respondents indicating a willingness to provide assistance to other medical schools. It would be a worthy goal for medical schools to attain a similarly high level of satisfaction with the other three content areas included in the PSAA.

Community Dimensions of Medical Practice

A relatively low number of respondents expect students to achieve the objectives in "Community Dimensions of Medical Practice." Of particular concern was that fewer than 60% of the respondents expect their students to be able to describe how to deliver population-based health care. In this era of expanding managed care and increasing attention to the needs of populations, medical schools need to prepare physicians to practice the type of medicine that will enable them to think beyond the individual patient. Adequate preparation for population-based care will require more than just talking about the subject in the classroom. Community-based experiences will need to be provided if we expect our medical school graduates to both understand and be able to practice community-responsive care. This involves substantive changes in where student learning will occur and in the types of experiences they will require to prepare them for the future.

A lower number of respondents indicate that they actually assess the students' competence in the area of "Community Dimensions." The need for assistance in assessing students' abilities is confirmed by the fact that 46% of the respondents desire assistance with methods to teach and/or evaluate students' learning in the area of "Community Dimensions." The fact that this is an area that warrants additional attention is also confirmed by the lower percent of people who are satisfied with their evaluation methods and the small number willing to be of assistance to other medical schools.

Health Services Organization and Delivery

The educational outcomes described in this section of the PSAA generated the smallest number of respondents who felt that these competencies were ones that medical students should attain prior to graduation. Similarly, this section had the lowest percent of responses of any of the four sections of the

PSAA relating to the evaluation of students' learning. Fortunately, there appears to be a substantial interest in receiving assistance with either designing curricula or improving the evaluation methods in health services. It is particularly ironic that the outcomes reflected in this section are of lesser interest to medical educators given that issues relating to health services organization and delivery are of particular relevance in today's society. It would be unfortunate for medical schools to graduate physicians who are not adequately prepared to understand the system of health care in which they will be practicing.

It is encouraging to note the nearly unanimous acknowledgement by the respondents of the importance of including clinical preventive services and quantitative methods in medical student education. "Community Dimensions" and "Health Services" are areas more recently recognized as important for future physicians, so the results showing less emphasis in these two areas may not be surprising. New models, such as the combined medicine and public health curriculum developed at Tufts University, may help integrate population health into medical education in the future.³ Others have identified the need for physicians to be knowledgeable about the business and organization of the health care system, thus validating the need for a greater emphasis on teaching about health services organization and delivery.⁵

An observation that emerged during the conduct of this survey relates to the issue of leadership for prevention education in medical schools. When follow-up contact was made with curriculum leaders at non-responding medical schools, many indicated it would be difficult for them to determine who should complete the PSAA at their institution. This response is concerning given that the need for defined faculty leaders for prevention has long been identified as an important issue.^{1,2} Certainly most medical schools have clearly designated leaders who coordinate the curriculum for such content areas as physical diagnosis and history-taking. It seems equally important that one or more individuals be given the responsibility and authority in each medical school for coordinating the prevention curriculum.

One of the other insights gained from this study is that it appears that there is quite a range of opinion across medical schools as to what should be taught within the prevention curriculum. It would be desirable to have a process on each campus to enable the faculty to explicitly determine what medical students should learn about prevention. Then, a coordinated approach can be utilized to assure that the areas deemed of importance are adequately addressed in the medical school curriculum.

Conclusion

The results of the Prevention Self-Assessment Analysis provide a perspective about the status of prevention education and evaluation in U.S. allopathic and osteopathic medical schools. It is encouraging that a high percentage of the respondents concur that teaching and evaluating students' regarding clinical preventive services and quantitative methods is important. It is also clear, however, that considerable attention needs to be paid to helping medical schools that seek to improve their prevention education and evaluation methods. Certainly, designated leaders to coordinate prevention education on each campus will be critical. In addition, resources such as the Internet can be utilized in

the future to facilitate networking between medical schools leading to improved educational programs and evaluation methods in prevention.

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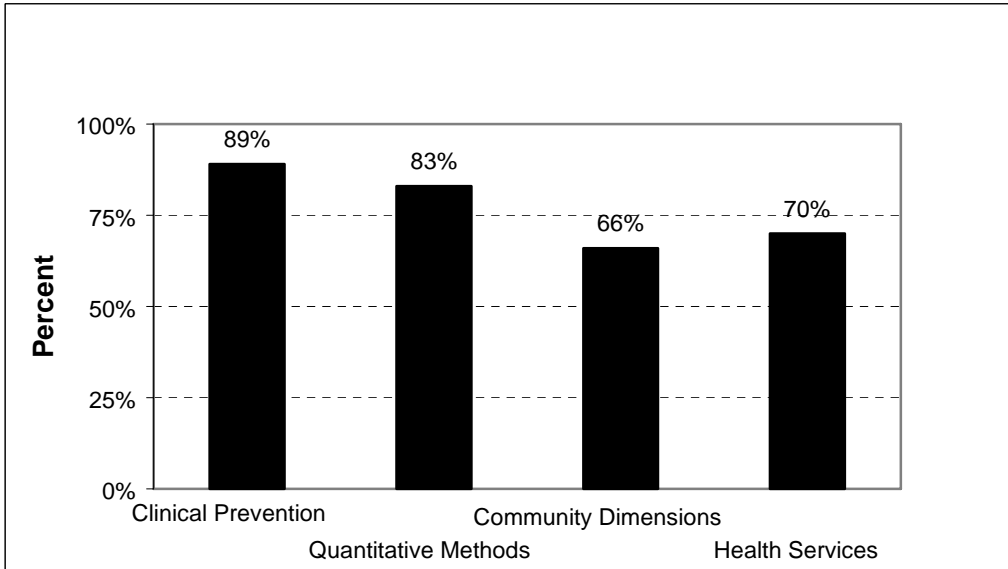


Figure 1: Percent of schools that expect students to achieve educational outcomes within each content area (N=96).

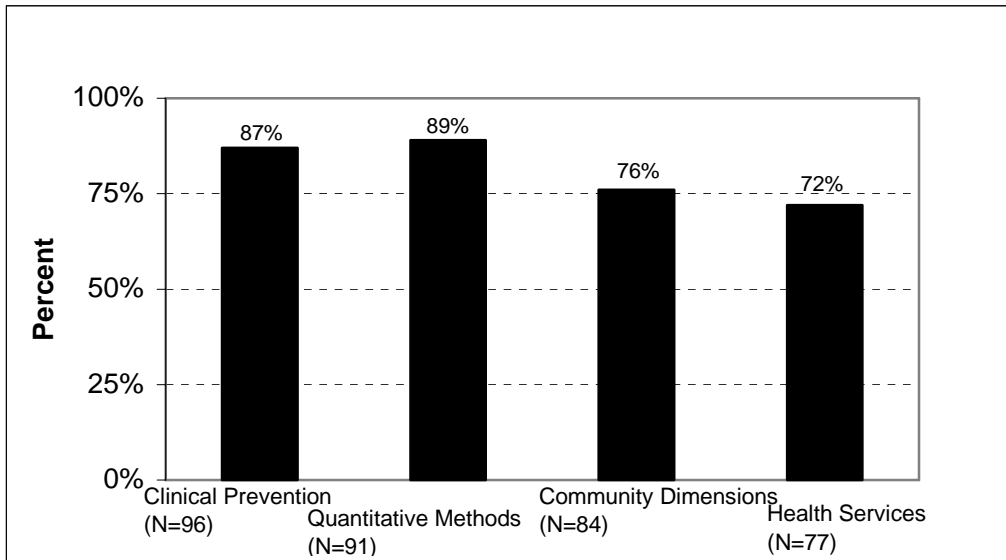


Figure 2: Percent of schools that actually measure students' competence within each content area.

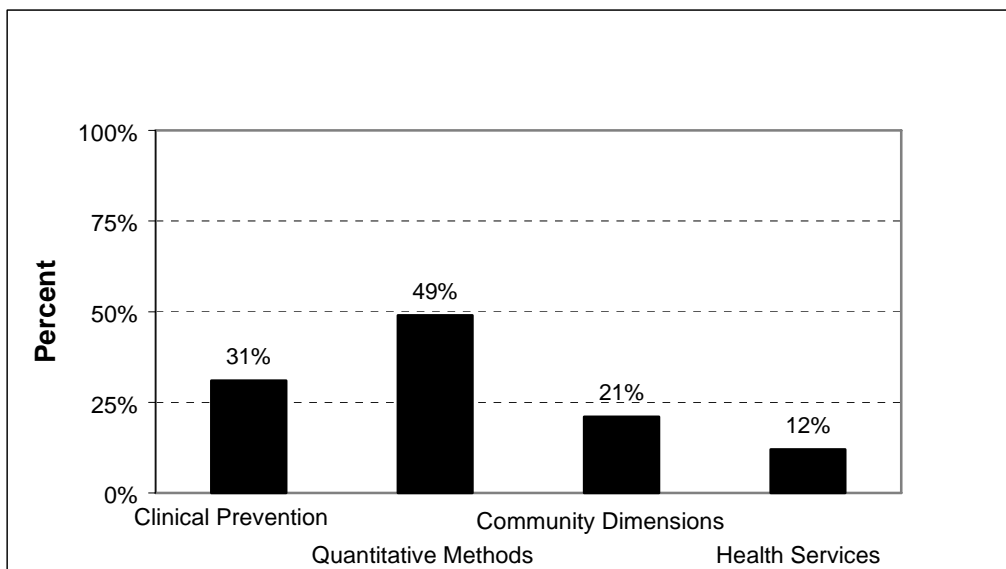


Figure 3: Percent of schools that are satisfied (4 or 5 on the Likert scale) with the quality of the outcomes they are using to assess students' learning in each content area.

Clinical Preventive Services

Do you expect students to...

1. demonstrate the ability to identify the eligibility of patients for: screening tests? prevention counseling? immunizations? chemoprophylaxis?
2. demonstrate the skills required to directly provide those preventive services in primary care which are appropriately performed by physicians – screening tests? prevention counseling? immunizations? chemoprophylaxis?
3. define concepts and requirements for effective preventive interventions?
4. differentiate between primary and secondary prevention interventions?
5. describe ways to integrate disease prevention/health promotion into clinical practice?
6. explain effective approaches for utilizing interdisciplinary health care teams for the provision of preventive services?

Quantitative Methods

Do you expect students to achieve the following outcomes?

1. Define and interpret measures that describe mortality and morbidity rates
2. Identify the most important causes of morbidity and mortality in each age/race/gender of a defined population
3. Apply the principles of validity to diagnostic and screening tests
4. Access research publications and identify the type of study
5. Access research publications and identify the strengths and weaknesses of study methods
6. Demonstrate an understanding of commonly used measures of association in epidemiology
7. Explain how concepts of bias & confounding are applied in data analysis and interpretation
8. Assess & apply scientific study results by understanding and interpreting the most commonly used statistical methods
9. Describe the principles and value of a cost-effectiveness analysis
10. Identify and interpret the basic elements and use of a decision tree

Community Dimensions of Medical Practice

Do you expect students to achieve the following outcomes?

1. Describe the steps to follow when implementing community-responsive, population-based health care
2. Demonstrate an appreciation of the effect of language, culture & style on the provision of health care services
3. Identify special disease risks of high risk groups in the community
4. Identify community resources which may complement individualized clinical care
5. Identify examples & mechanisms that can reduce or eliminate community-based risk factors
6. Identify special risk factors seen in immigrant populations & resources needed to properly treat them
7. Identify and educate about special risk factors that confront individuals traveling abroad and methods to reduce the risks

Health Services Organization and Delivery

Do you expect students to achieve the following outcomes?

1. Describe methods used to assess quality of health care services to individuals & populations
2. Describe & discuss approaches used to assess costs & effectiveness of health care services provided to patients at individual & institutional levels
3. Identify different functions of organizations involved in the delivery of clinical care: hospitals; ambulatory; rehabilitative & long term care facilities; home care agencies
4. Describe basic funding mechanisms in US for preventive, curative & rehabilitative services & common gaps in coverage
5. Discuss role of market forces in affecting cost, content, quality, distribution & access to health care services
6. Describe basic principles of governance & regulation of the medical profession

Table I: Questions included in the Prevention Self-Assessment Analysis