

# Using Economic Evaluation to Improve the Quality of Care: An Attitudinal Outcome in a Pharmacoeconomics Course

Lon N. Larson

**ABSTRACT.** Since treatment decisions made on behalf of an individual patient consume resources from a shared pool of funds, they affect—and may even harm—the health of the population or community. For health professionals and students who are accustomed to disregarding cost in the name of quality this is a difficult concept to accept. Yet it must be accepted if limited resources are to be used to achieve their maximum benefit. To this end, an attitudinal or affective outcome was added to a course in pharmacoeconomics; specifically, in making drug use decisions or recommendations, the student, realizing that resources are limited, considers the opportunity cost and the welfare of the community. This paper describes the rationale for such an outcome, the methods used to accomplish it, and the success achieved. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: <getinfo@haworthpressinc.com> Website: <<http://www.HaworthPress.com>> © 2001 by The Haworth Press, Inc. All rights reserved.]*

**KEYWORDS.** Resource allocation, economic evaluation, cost-effectiveness analysis, population health, teaching pharmacoeconomics

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*Most of the controversy that appears to be about cost-effectiveness analysis is really about whether resources are limited or not.*

– David M. Eddy (1)

### INTRODUCTION

Economic evaluation of pharmaceuticals (also known as pharmacoeconomics or cost-effectiveness analysis) can enhance the quality of care. Pharmacy students and practitioners frequently misunderstand this concept. Cost-effectiveness analysis—as implemented through formularies and practice policies—is seen as a means to control costs. The effect on the quality of care is perceived to be negative, or perhaps neutral, but certainly not positive. This paper reports an attempt to incorporate an attitudinal outcome in a course in pharmacoeconomics. An attitudinal or affective outcome implies a preference (the student will do it). In contrast, a cognitive outcome implies a capability (the student can do it) (2). While students and practitioners may cognitively know that resources are limited, their behavior in terms of patient care decisions and recommendations may suggest otherwise. The attitudinal outcome of the course was: *In making drug use decisions or recommendations, the student, realizing that resources are limited, considers the opportunity cost and the welfare of the community.*

In addition to this attitudinal outcome, the course had a cognitive outcome that is more commonly associated with pharmacoeconomics courses (3). The cognitive outcome was this: Given a pharmacoeconomic analysis (economic evaluation), the student can critically appraise its methods and validity. These two outcomes are conceptually related. The cognitive outcome deals with “the how”—the methods—of economic evaluation; this enables the student to critically assess research results. The attitudinal outcome deals with the “why”—the purpose—of economic evaluation, and this enables the student to use those results to achieve the largest benefit with a limited pool of resources.

The attitudinal outcome might be clarified by an example. A question from an examination asked:

You heard in your Therapeutics course that mammograms are recommended for women beginning at age 40. You have read a study (Salzmann, et al.) which indicates mammogram screening is cost-effective beginning at age 50, but not at age 40 (4). How do you explain this difference in views? What are the implications of each view for clinical decisions?

This question highlights the conflict between the individual and the community or population in allocating scarce resources. The individual perspective recommends screening 40-year-olds because it produces some health benefits; cost is not considered, only effects. This perspective appears to generate high levels of quality because a patient receives all potentially beneficial services, yet it can be detrimental to the health of the community. The health of the community would be enhanced if routine screening of 40-year-olds was not done and those resources were used in some other way (e.g., increasing the screening rate among women over 50 years of age) (5). Despite its high cost and negative effect on population-based quality, the individual perspective is deeply embedded in our society and its health professionals.

### ***BACKGROUND AND RATIONALE***

To practice effectively in the decades ahead, the pharmacist must accept that health resources are limited and must behave accordingly, that is, to use those resources wisely and generate the most benefit. Living within the reality of limited resources may be the greatest challenge facing health professionals. As a society, we have deceived ourselves into believing health care resources are unlimited. The prevailing view of good patient care is that the patient should receive all services and therapies that may be potentially beneficial, and ideally, costs should not be considered in patient care decisions. For many practitioners and students, withholding or denying beneficial treatments because of cost is viewed as immoral. The assumption that underlies this outlook—although often unrecognized or unspoken—is that resources are unlimited and so no one is harmed by unlimited use of services.

No matter how much we may wish that this view of good patient care were true, it simply does not fit with reality. Reality is that resources are limited. This is seen in the unwillingness of employers and taxpayers to pay ever-increasing premiums and taxes. Every service or therapy has an opportunity cost. That is, when resources are spent for one purpose, they cannot be used for another—some other opportunity is foregone. For instance, resources spent on Medicaid cannot be spent on education, or dollars spent on employee health benefits are not available for salaries. Consequently, when resources are pooled, as with employment-based insurance and government programs like Medicare and Medicaid, the interests of individual patients may conflict with the interests of the community (i.e., those pooling their resources for health

services). As a patient consumes health services and draws resources from the pool, the resources must be replaced, yet we do not want to pay higher premiums and taxes.

An alternative approach to defining good patient care focuses on the welfare of everyone in the community, not solely patients' welfare. From this view, resources should be used to improve population-based indicators of health. Potentially, some services or therapies should not be used, even though they may benefit an individual, if the health of the community can be better served by spending those resources in some other fashion. The health of the community is improved by moving scarce resources away from "high-cost, low-benefit" services to ones that are comparatively "low-cost, high-benefit," even though individual patients may be harmed because they are denied access to the "low-benefit" services (5). Evaluating services as to their costs and benefits is the purpose of economic evaluation. In other words, this view recognizes that rationing can improve the health of the community. When the goal is to achieve the most benefit with a limited budget (which is the situation facing drug program managers), then cost-to-benefit ratios are needed to allocate resources in the most beneficial manner. Although this viewpoint fits with economic reality, it is not widely accepted by health professionals or the public. Many find it inimical to good patient care. The attitude of unlimited resources is deep-seated.

Cost-effectiveness should not be the sole criterion in deciding how to spend limited resources. Cost-effectiveness analysis reflects a consequentialist or utilitarian view: providing the greatest good for the greatest number (6). However, allocation decisions can be based on other ethical principles, such as helping those with the greatest needs. While the ethical implications of cost-effectiveness analysis are legitimately debated, there is little doubt that such analyses help clarify and inform decision making. Further, these ethical considerations do not negate the reality of limited resources. The question is not whether rationing is necessary but how to ration ethically.

### ***STUDENTS AND TEACHING METHODS***

When the evaluative data reported in this paper were collected, 65 students were in the class, which was a required course in the didactic year of a track-in Doctor of Pharmacy program (the third year of the four-year professional program). One student in the class was a biology major pursuing a master's degree in public administration. The phar-

macy students had previously taken courses dealing with health systems and with pharmacy management, and they were taking a course in drug literature evaluation concurrently with this course.

At the beginning of the semester, the students were divided into groups of four students each. Data acquired in a student survey (i.e., grade point average, expectations concerning the usefulness of and interest in the course material, English as a second language, and gender) were used to assign students to groups. These small groups were used extensively throughout the semester. Often class discussions began within the small groups, and then students shared their observations and insights with the entire class. The groups did not meet outside of the scheduled class time.

As mentioned earlier, the attitudinal outcome of this course—focusing on using cost-effectiveness analysis and rationing to improve the quality of health care—is a major shift for health professionals and students. Such a change requires thinking, analysis, and reflection on the issue. Discussion was the primary teaching method used to accomplish this outcome. In these discussions (as in any discussion), students heard and responded to other viewpoints. They were forced to reflect upon and clarify their views as they publicly expressed themselves. The instructor, especially at the beginning of these discussions, assumed an advocacy position to stimulate thought and provoke reactions. To assist students in preparing for discussions, questions were sometimes distributed ahead of time to guide students' reading. In some instances, students were asked to write responses to one or more of these questions, a reflective essay, or questions for discussion.

A series of essays written by David Eddy served as the primary source of background material explaining the effects of resource allocation on the quality of health care outcomes. The essays appeared originally in *JAMA* and have subsequently been compiled in a book, *Clinical Decision Making: From Theory to Practice* (7). Eddy clearly contrasts the two viewpoints for allocating resources: that of the individual patient and that of the community (or insured group). Using examples, Eddy effectively illustrates the opportunity cost of spending resources on services that are comparatively “low-benefit, high-cost” technologies (1, 5, 8). This opportunity cost is the “improvements in health status foregone” by not spending the resources on “higher benefit, lower cost” services. Clinical decisions made in the best interests of individual patients can harm the health status of the community. Eddy also clearly explains how cost-effectiveness ratios are necessary if one wants to get the most benefit from limited resources and demonstrates the potential

use (and limitations) of cost-effectiveness analysis in setting priorities among services in a Medicaid program (1, 9, 10). In sum, these essays are effective in illustrating the role of cost-effectiveness analysis and rationing in improving the quality of care when viewed from the community's perspective. To elucidate the themes considered in these essays, selected discussion questions are included in the Appendix.

### ***EVALUATIVE DATA***

Three sources of data were used to assess success in meeting the attitudinal outcome. All three suffer methodological problems, but each offers some support that this course changed attitudes. The first source of evaluative data—and least directly related to the attitudinal outcome—was the students' course evaluations. At the end of the course, students were asked to agree or disagree with a series of items. These items related to the entire course and not just the attitudinal outcome. Over 70% of the students thought the course objectives had been met, while 11% thought they had not been met; the remainder were neutral. One of the stated course objectives was the attitudinal outcome described in this paper.

A second source of data was the responses to the final examination question mentioned earlier (dealing with mammography screening of 40-year-olds). The question and potential elements in the response are shown in Figure 1. Answers were graded by one individual (the instructor), so biases may have been present. Of the 65 responses, 51 (79%) were judged to be good to excellent, 8 (12%) were weak, and the remaining 6 (9%) missed the point.

Finally, before and after the course, students completed a short survey in which they were asked to indicate their agreement (strongly agree, agree, disagree, strongly disagree) with four statements pertaining to resource allocation and rationing. The items are shown in Table 1. These items are not a validated scale of attitude toward rationing; hence the data were analyzed conservatively. Each item was analyzed separately. The four responses were condensed into two: those students who agreed or strongly agreed with the statement and those who disagreed or strongly disagreed (there was no neutral or no-opinion response). Agreement with a statement indicates an unfavorable attitude toward rationing, while disagreement signifies a favorable attitude toward rationing.

Table 1 also presents the proportion of students who disagreed (or strongly disagreed) with each item before the class and after it. Again, disagreement indicates an attitude that is favorable toward rationing or the population perspective of allocating resources. Before the course,

FIGURE 1. Exam Question to Assess Attitudinal Outcome.

In your therapeutics course, mammograms were recommended for women beginning at age 40, but an economic evaluation suggests mammogram screening is cost-effective beginning at age 50, but not at age 40. How do you explain this difference in views? What are the implications of each view for clinical decisions?

Key points that could be included in the response:

- The “therapeutics view” focuses on the individual in allocating resources. It employs any service that may produce benefit, regardless of its cost. This view gives the satisfaction of doing everything possible for a patient, but it is very costly.
- The “cost-effectiveness view” focuses on the health of the community in allocating resources. This view is preferred when considering the health status of the population, even though it may harm some individuals. For an HMO or insured group with limited resources, this view generates the most health benefit for all the members of the group.
- Resources are limited, and the opportunity cost of a service should be considered. The resources spent on screening 40-year old women are not available for other purposes that may produce more benefit (e.g., programs that encourage 50-year-old women to get mammograms). This is the opportunity cost of the screening—the alternative foregone.
- The “benefit” of a health service, when using pooled resources, is best measured as population-based outcomes.

students were quite negative toward rationing. About one-quarter of the students (or less) disagreed with each of the statements. After the class, the opposite was true: 84% or more of the students disagreed with each item. Looking at the change from the standpoint of individual students, before the class started, 8% of the students disagreed with 3 or 4 of the statements, while this was the case for 88% of the students after the class had concluded. The second set of scores (i.e., the post-test) may have been influenced by a socially desired response bias, as the students by this time clearly knew the preferences of the instructor. To minimize this bias, the data were handled in such a way that the instructor would not have access to them until after final grades for the course had been assigned.

### **SUMMARY**

This course attempted to present pharmacoeconomics as a means of enhancing quality and improving population-based outcomes by improving the use of scarce resources. While most health professionals cog-

TABLE 1. Responses to Attitude Items, Before and After the Class.

	Percent "Disagreeing"*	
	<u>Before</u>	<u>After</u>
The operating philosophy of an HMO is, "We build our business one life at a time. We focus on the needs of each patient and provide all necessary care in a caring manner." Do you agree that this is a good approach to achieving the HMO's goal of improving the health status of its entire membership?	27.7	83.1
Patients should receive all health services that are medically necessary, regardless of cost.	16.9	84.6
Rationing health care services is <i>undesirable</i> and should be avoided.	24.6	95.4
Managed care plans (HMOs) should <i>not</i> be allowed to withhold services or make access to those services difficult.	18.5	84.6

\* "Disagreeing" with the item indicates a positive attitude toward rationing. Four responses were available: strongly agree, agree, disagree, strongly disagree. The number shown in the table includes those who responded as disagree or strongly disagree; the remainder of respondents agreed or strongly agreed with item.

nitively realize that resources are finite, their patient care decisions are often based on the assumption of unlimited resources. Hence, an attitudinal or affective outcome was added to a course in pharmacoeconomics. The outcome focused on the reality of finite resources and its implications for patient care decision making. For students and practitioners to consider the opportunity costs of decisions and the health of the community is a major shift in outlook, but this shift is essential in a world of limited resources and managed care. The available evaluative data indicate the course may have been successful in accomplishing this outcome.

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## REFERENCES

1. Eddy DM. Cost-effectiveness analysis: a conversation with my father. *JAMA* 1992; 267:1669-75.
2. Cyers TE, ed. Handbook for the design of instruction in pharmacy education. Bethesda, MD: American Association of Colleges of Pharmacy; 1977.

3. Rascati KL, Conner TM. Pharmacoeconomic education in U.S. schools of pharmacy. *Am J Pharm Educ* 1998; 62:167-9.
4. Salzmann P, Kerlilowske K, Phillips K. Cost-effectiveness of extending screening mammography guidelines to include women 40 to 49 years of age. *Ann Intern Med* 1997; 127:955-65.
5. Eddy DM. Rationing resources while improving quality: how to get more for less. *JAMA* 1994; 272:817-24.
6. Buchanan A. Managed care: rationing without justice, but not unjustly. *J Health Politics, Policy, Law* 1998; 23:617-34.
7. Eddy DM. *Clinical decision making: from theory to practice*. Boston: Jones and Bartlett; 1996.
8. Eddy DM. Applying cost-effectiveness analysis: the inside story. *JAMA* 1992; 268:2575-82.
9. Eddy DM. What's going on in Oregon? *JAMA* 1991; 266:417-20.
10. Eddy DM. Oregon's methods: did cost-effectiveness analysis fail? *JAMA* 1991; 266:2135-41.

## APPENDIX

### Discussion/Thought Questions for Selected Essays

#### *Eddy DM, Cost-effectiveness analysis: a conversation (1)*

What problem is informed by economic evaluation? What questions are addressed?

Why do we need economic evaluation in health care?

What is the evidence that resources are limited?

Results of CEA are "obvious from the population perspective, [but they are] counter-intuitive from the practitioner's perspective." Explain.

"Most of the controversy that appears to be about cost-effectiveness analysis is really about whether resources are limited." Explain.

From pharmacy, give an example of the conflict between the population perspective and practitioner's perspective in allocating resources.

Explain why each of these statements is false?

"Cost-effectiveness analysis (CEA) will harm persons with rare disease."

"CEA will harm persons needing expensive treatments."

"CEA will impair new technology and medical innovation."

Economic evaluation forces us to consciously think about things at a public level that we would rather leave at a subconscious, private level—what things?

#### *Eddy DM, Rationing resources while improving quality (5)*

Eddy's approach to improving resource allocation is to move resources from "low benefit, high cost" services to those that are comparatively "high benefit, low cost." Explain. Give examples.

What is the objective of a health plan (HMO, Medicaid)? What indicators best measure the quality of a health plan? How does cost-effectiveness analysis help accomplish that objective?

The activities necessary to move resources to “higher benefit, lower cost” services are: (a) analyze practices at level of specific indication, (b) accept that resources are limited, (c) use quantitative reasoning rather than qualitative—such as “potential” benefit, (d) focus on populations rather than individuals, (e) help patients understand the consequences of a limited resource pool and the need to be fair, (f) reinforce the strategy with the measures used to judge the quality of plans. Explain how these activities relate to developing drug formularies and prescribing guidelines.

Eddy's advice for clinicians is, “When in doubt, don't.” Why is this sound advice? Why is it so hard to do?

*Eddy DM, Applying cost-effectiveness analysis: the inside story (8)*

This essay recounts a health plan's dilemma with radiographic contrast media; how does this relate to drug therapy?

A frequently heard statement is, “There is insufficient evidence to develop a practice guideline; the decision is best left to the discretion of the individual practitioner.” What is your response?

Describe alternative methods by which benefits can be compared to costs. What is “opportunity cost”?

The results of economic evaluation are difficult to implement. Explain.

Economic evaluation offers tremendous opportunities for improving quality while controlling costs. Explain.