

CHAPTER I

INTRODUCTION

Background

In the past several decades, interest in nutrition has skyrocketed as poor diet has been increasingly recognized as a major contributor to morbidity and mortality in the United States. Four of the 10 leading causes of death have been linked to diet.¹ Increased physical activity and positive dietary changes are seen as essential in the achievement of good health and prolonged life. The Surgeon General's Report² stated that unbalanced eating and drinking habits contribute to heart disease, cancers, strokes, diabetes mellitus, obesity and other fatal diseases. The link between dietary fat and coronary heart disease is well-established.³ Now studies are showing a link between dietary and lifestyle habits and many cancers, specifically breast,⁴ colon and prostate cancers.⁵ The link between diet and health has been established, and the opportunity to prevent diet-related chronic diseases is one of the greatest challenges that the nutrition community now faces. Nutrition education is viewed as a central component of health promotion and disease prevention programs which are directed at reducing the incidence of chronic diseases.

One program that has addressed the nutritional needs of low-income families is the Expanded Food and Nutrition Education Program (EFNEP). The need for effective nutrition education of low-income families was established by the mid-1960s.⁶ Throughout the early and middle 1960s, the Cooperative Extension Service, (CES), the educational arm of the United States Department of Agriculture (USDA), became increasingly aware of the severe nutritional problems among low-income families and their need for nutrition education. Nutrition education has been one of the base program of CES since its inception. In 1967-68, CES funded projects in several states in which effective approaches were developed for implementing an educational program with low-income families. These pilot projects laid the foundation for EFNEP and provided methods and materials to serve as a core around which a program of national scope

evolved. For almost 30 years, EFNEP has continued to be the largest federally funded nutrition education program supported with over \$60 million each year, and is now operating in all 50 states and several U.S. territories.⁶ EFNEP is designed to provide nutrition education to limited resource families with young children and help them acquire nutritionally sound diets within their available resources. Changed dietary behavior, rather than just knowledge gain, has been the goal of EFNEP since its inception.

The value of preventive measures is gaining increasing attention in the healthcare field because they reduce the risk of a wide range of diseases and subsequent suffering, and may reduce the future cost of health care. Either benefit may be sufficient to warrant expenditures on prevention, although most of the recent attention has been directed to health care cost-savings potential. Scientific evidence is mounting that nutrition programs and services can prevent, postpone, or mitigate the onset or progression of disease and save scarce health care dollars.⁷ In the past decade, research has proven linkages between nutritional factors and health status as well as nutrition intervention and disease incidence. The quantification of these linkages has provided the data needed to conduct formal cost-benefit analysis of nutrition programs.

Optimal health and physical development through dietary improvement are the ultimate goals of nutrition education. Justification for continued funding of intervention programs should be based, in large measures, on the extent to which participants make needed dietary changes as a result of the skills and knowledge gained.⁸ Follow-up strategies to assess change in behavior of participants in many nutrition interventions has been poor and little data is available on whether changes were sustained over time. Since long-term attitude and behavior change is the primary rationale for health-promotion programs, failure to evaluate it on this basis is a major weakness in the existing literature on many nutrition education programs.⁹ In contrast, one 5-year follow-up study of EFNEP graduates showed that the positive scores on dietary and food-related behaviors exhibited by participants on graduation from the program were maintained five years later.¹⁰

In the past, EFNEP has been evaluated for efficacy of its program methods and content,¹¹ adequacy of the data collection procedures¹² and positive changes in dietary and food-related practices.¹³ In 1992, an Evaluation/Reporting System (ERS) was implemented nationwide in EFNEP that captures many of the important impacts of the program. This is accomplished by comparing dietary intakes of the participants to the Food Guide Pyramid and the Recommended Dietary Allowances for key nutrients, and by measuring changes in behavior related to food resource management, food safety, and improved nutrition practices. However, the impact of EFNEP in terms of cost savings were essentially undocumented. In recent years, EFNEP leaders have recognized the need to conduct a cost-effective or a cost-benefit analysis to study the economic efficiency of the program. Consequently, in 1996, the Virginia Cooperative Extension (VCE) was awarded a grant from the Cooperative State Research, Education, and Extension Service, United States Department of Agriculture (CSREES,USDA) to conduct a cost-benefit analysis of nutrition education programs, with an emphasis on EFNEP.¹⁴

In the current political climate there has been much scrutiny of the costs of health and human services and recognition that costs must be controlled or reduced. Thus, it is more likely that government resources will continue to be allocated to those programs that show the highest benefit to cost value.¹⁵ Cost-benefit analysis (CBA) and cost-effective analysis (CEA) are two popular techniques used to evaluate the economic efficiency of a program. The principle technical distinction between the two lies in the process of valuing the desirable consequences of the programs.¹⁶ CBA provides the most comprehensive consideration of the costs and benefits of intervention programs with results of CBA being expressed in terms of net dollars. In contrast, CEA relates the cost of resources in dollars to the amount of outcome achieved, expressed in natural units such as pounds of weight loss.

The essence of cost-benefit analysis is a comparison of the benefits of a proposed or existing expenditure or program with its costs. The costs of a particular program are ultimately the value of resources that must be drawn from the economy to operate the program.¹⁶ Costs of

any particular health program fall into two categories: direct and indirect. Direct costs are usually defined as the actual expenditures for resources involved in the health program--expenditures for staff, equipment, and so forth. Indirect costs include the value of time lost from work by participants in the program, the value of pain and/or discomfort due to side-effects that might accrue to individuals participating in the program, and any undesirable income and/or wealth redistribution effects stemming from the program itself.

Although some difficulties exist in computing the total cost of a given program, particularly with respect to calculating the indirect costs, the major difficulties in conducting cost-benefit analysis arise in the context of enumerating and quantifying the total benefits of the program.¹⁶ In general, the benefits of a program would be all the costs that would be avoided if the program. Benefits are of two types: direct and indirect.

The direct benefits of a health-related program are the direct costs that are averted as a result of that program, more specifically the direct economic costs of those diseases averted as a result of the program.¹⁷ Also, indirect benefits may be defined in terms of costs averted as a result of a particular program. The theory is that a program that is successful in reducing or eliminating a particular illness indirectly benefits society by increasing the productivity of its workers through longer life expectancies and/or reduced disability days. Reduction in indirect costs of a particular illness, calculated as the productivity losses through mortality and morbidity of the sufferers, becomes the indirect benefits of a program aimed at preventing or curing that illness.

Direct and indirect costs and benefits that can be easily monetized are known as tangible costs and benefits.¹⁶ Those direct and indirect costs and benefits that cannot be easily monetized are known as intangible costs and benefits. Though intangible costs and benefits need to be examined and addressed in a cost-benefit study, they will be excluded from this study because intangible costs and benefits, such as travel costs to attend the program session, increase in self-esteem due to program participation, better use of nutrition-related resources, and increased

quality of life were not assessed in 1996 EFNEP graduates. Furthermore, the transient nature of the low-income population would have made additional primary data collection on these graduates difficult. For the purpose of this research, it was decided that only existing EFNEP records would be used. Though computation of the cost-benefit ratio for the Virginia EFNEP included both direct and indirect benefits, the study incorporated in this dissertation addressed only the assessment of the *direct tangible* benefits based on the savings from economic costs of avoided diseases. Results, calculation, and discussion of the indirect tangible benefits of the Virginia EFNEP, specifically the wages accrued from lost productivity, morbidity and premature mortality from disease, has been addressed elsewhere.¹⁸

The purposes of this study were (a) to estimate the economic value of the participant food-related behavioral changes brought about by EFNEP in Virginia and (b) to determine if the total estimated economic value outweighed the yearly cost of implementing the program. Significant food and nutrition-related behavioral changes were already being documented in the program through computerized EFNEP Evaluation/Reporting System (ERS 3.0). However, little attempt had been made to determine the economic benefits of these behavioral changes to the participants, society, government funding organizations or the health care system. For the purpose of this study, it was assumed that the positive dietary and food-related practices gained in EFNEP would be retained and practiced by the participants over their lifetime.¹⁴

The specific research questions addressed by this study were as follows:

1. What were the potential benefits that might result from the food and nutrition-related behavioral changes made by the participants?
2. Could these benefits be translated into dollar values either through cost savings or income earned and, if so, what was the total value for all participants graduated from the program each year?
3. When overall economic value of the program was compared with program cost, was the value significantly greater than the cost of implementing EFNEP in Virginia?

Cost-benefit analysis has not been frequently applied to nutrition education programs, primarily due to the difficulties associated with applying a monetary value to the outcomes achieved. The investigators of this study recognized the need to gain an understanding of classical economics to conduct a CBA. Since CBA uses the common metric of dollars to express program outcomes, it answers one question: “Does a project generate net savings?” In the current study, a cost-benefit analysis was conducted of the Virginia EFNEP in order to justify the economic efficiency of the program to the federal sponsors and to ensure continued and increased funds.

Definitions

Behavioral prevention strategies: Strategies that require that an individual make a personal effort to change life-style and food-related practices.

Benefit-cost ratio: A mathematical comparison of the benefits divided by the costs of a project or intervention. When the benefit-cost ratio is greater than 1, benefits exceed costs.

Contingent valuation studies: The use of surveys of individuals conducted in the context of a hypothetical market situation to elicit consumer valuation of goods and services. Used to estimate the willingness-to-pay (WTP) values of health outcomes.

Cost: A measure of what must be given up to acquire or produce something.

Cost analysis: The process of estimating the cost of intervention educational programs.

Cost-benefit analysis (CBA): A type of economic analysis in which all costs and benefits are converted into monetary (dollar) values and results are expressed as either the net present value or the dollars of benefits per dollars expended.

Cost-effectiveness analysis (CEA): An economic analysis in which all costs are related to a single, common effect. Results are usually stated as additional cost expended per additional health outcome achieved.

Cost-utility analysis (CUA): A type of cost-effectiveness analysis in which benefits are expressed as the number of life years saved adjusted to account for loss of quality from morbidity of the health outcome or side-effects from the intervention.

Direct costs: The measure of the resources expended for prevention activities or health care.

Discounting: A method of adjusting the value of future costs and benefits to an equivalent value today to account for time preference and opportunity cost, i.e., a dollar today is worth more than a dollar a year from now (even if inflation is not considered).

Discount rate: The rate at which future costs and benefits are discounted to account for time preference.

Effectiveness: The improvement in health outcome that a prevention strategy can produce in a typical community-based settings.

EFNEP graduates: EFNEP participants who completed an entry and exit questionnaire by September 1996.

Human capital (HC) approach: A method for estimating the economic impact of disease, which includes the resources used for medical care and the forgone earnings due to morbidity or premature mortality.

Incidence-based cost: The total lifetime cost of new cases of a disease or injury that occur during a certain period of time.

Incidence rate: A measure of frequency of new cases of disease in a particular population, which occurred during a certain period of time.

Indirect cost: The resources forgone either to participate in an intervention or as the result of a health condition (e.g., earnings forgone because of loss of time from work).

Long-term benefit: A benefit whose economic value is accrued to the recipient at some time in the future.

Productivity loss: The value of output not produced due to morbidity or premature mortality.

Program decision-maker: User of the results of this cost-benefit study, namely the federal government.

Program evaluation: An assessment of the processes, impacts, and outcomes of intervention programs, with particular attention paid to the purposes and expectations of stakeholders of the program.

Program participant: Limited resource adult who receives the EFNEP lessons.

Risk: The likelihood that a person having specified characteristics (e.g., high blood cholesterol) will acquire a specified disease or injury.

Sensitivity analysis: Mathematical calculations that isolate factors involved in a decision analysis or economic analysis to indicate the degree of influence each factor has on the outcome of the entire analysis.

Shadow price: An imputed valuation of a commodity or service for which no market price exists. The social opportunity cost of an outcome.

Short-term benefit: A benefit whose economic value is immediately accrued to the recipient.

Social discount rate: The rate at which society as a whole is willing to trade present costs in exchange for future benefits. The lower rate indicates that future benefits are also valued highly in

the present.

Stakeholder: An individual or organization with an interest in an intervention or outcome. Defined as policy decision-makers, program decision-makers, or others such as patients, health care workers, media, other researchers, and the general public.

Willingness-to-pay (WTP): A method of measuring the value an individual places on reducing risk of death and illness by estimating the maximum dollar amount an individual would pay in a given risk-reducing situation.