

CHAPTER V

SUMMARY OF RESULTS AND IMPLICATIONS

A cost benefit analysis (CBA) was conducted with the Virginia Expanded Food and Nutrition Education Program (EFNEP), using previously-collected data on 3100 EFNEP homemakers who graduated from the program in fiscal year 1996. The investigators employed procedures that have been commonly utilized in other CBAs within the field of economics. These procedures involved a computation of the tangible benefits of EFNEP in regard to prevention or delay of several chronic diseases and health conditions (colorectal cancer, heart disease, stroke, hypertension, osteoporosis, Type 2 diabetes, obesity, foodborne illness, low-birth-weight infants, and commonly occurring infant diseases). A parallel study by Lewis^{14,18} also assessed the dollar values of intangible benefits of the program with these values being reflected in the final benefit-to-cost ratio reported in this summary.

The direct tangible costs of conducting the 1996 adult Virginia EFNEP for all participants were identified and included salaries and benefits, office space, utilities, equipment, supplies, training and staff travel. A marginal excess burden (MEB) of 17% was also added to the direct tangible costs. Since EFNEP is funded by federal dollars, the MEB was included as a direct cost to ensure that the funds utilized to administer the Virginia EFNEP were not underestimated. The investigators chose to conduct and report this CBA from the perspective of the program sponsor, which is the Cooperative State Research, Education, and Extension Service (CSREES) of the United States Department of Agriculture. Funds for conducting the CBA were also provided by CSREES.

Summaries of the direct tangible benefits and costs of the Virginia EFNEP and the initial benefit-to-cost ratio (prior to sensitivity analyses) are shown in Table 9. The total direct tangible benefit for all the diseases and conditions was \$17,770,727. The total indirect tangible dollar benefit was estimated to be \$321,462.^{14,18} Together these benefits yielded a total of **\$18,092,184**.

The direct costs to administer the Virginia EFNEP were calculated to be **\$1,922,204**. As a result, the benefit-cost ratio for the Virginia EFNEP was calculated as **\$9.41:\$1.00**. This translates as a return of \$9.41 in benefits to the EFNEP graduates, for every dollar invested in the Virginia EFNEP.

In the current CBA, data were not available for some of the diseases and conditions related to the specific incidences of disease among low-income individuals. Since disease rates tend to be higher within the low-income population, the investigators believed that the benefit-to-cost ratio reported above was actually lower than the value that would have been obtained had more appropriate disease rates been used. Thus, in a parallel study to this CBA,^{14,18} sensitivity analyses were performed to adjust the disease rates to the estimated higher levels that seemed more logical for the low-income population. This analysis resulted in a benefit-to-cost ratio of \$17.19/\$1.00, or the potential return of \$17.19 for every \$1.00 spent to implement the program. Future studies are needed to determine if this high benefit-to-cost ratio is warranted. Also, a benefit-cost ratio of \$2.45/\$1.00 was achieved, when it was assumed that only 25% of the EFNEP graduates practicing optimal nutritional behaviors would retain these behaviors throughout their lives. This is a very gratifying result because the optimal nutritional behaviors represented very stringent selection. It also suggests that a positive benefit-cost ratio resulted for such a small subset of the EFNEP population that practices these behaviors. This could translate as higher benefits, had those graduates making any positive changes in nutritional behaviors been included in the analysis, along with those graduates who had already achieved the optimal intake of nutrients at entry into the program.

Table 9. Summary of Results of the Virginia EFNEP CBA.

Direct Tangible Benefits:	Value:
Colorectal cancer	\$50,789
Heart disease	\$19,263
Stroke	\$65,111
Hypertension	\$34,225
Osteoporosis	\$16,195,686
Type 2 diabetes	\$176,396
Obesity	\$94
Foodborne illness	\$879,413
Commonly occurring infant diseases	\$133,411
Low-birth-weight infants	\$216,334
Total direct tangible benefits	\$17,770,722
Indirect tangible benefits	\$321,462
Total benefits	\$18,092,184
Direct costs:	
Salaries and benefits	\$1,363,204
Office space	\$35,568
Utilities	\$90,480
Equipment	\$3588
Supplies/training	\$78,269
Travel	\$71,800
Marginal excess burden	\$279,295
Total costs	\$1,922,204

Benefit cost ratio	\$9.41/\$1.00
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Implications for program sponsors and leaders of the Virginia EFNEP

Given the many influences that foster unhealthy lifestyles and the barriers to effective nutrition education targeting low-income populations, a positive result of any size in a CBA should be gratifying to program sponsors and leaders. Nutrition education is often only one component of multifaceted programs that may vary considerably in content, scope, and duration. This may lead to difficulty in documentation and comparison of the specific results of nutrition education in those programs. Measuring behavioral change, evaluating health outcomes, and determining economic benefits are all complex and difficult to link to interventions.⁹⁹

One reason that the results of the current study have great significance is that this is the first time that the economic theories of CBA have been applied to a statewide EFNEP anywhere in the nation, or possibly to any other nutrition education program of similar magnitude. Experiences gained in this CBA indicate that such analysis would be feasible for other states to apply to EFNEP data and may be feasible with other nutrition education interventions. On the other hand, the process revealed that there are several inherent difficulties with the use of CBA in nutrition education programs and, for results of CBAs to be useful, sound data collection and data storage procedures must already be in place.

A cost-benefit analysis of EFNEP was possible, largely due to the well-established assessment procedures of the EFNEP Reporting/Evaluation System (ERS) and the ability of assessment tools to capture behavioral impacts of the program. Both the Food Practice Checklist and the 24-hour food recall have been validated and evaluated for their ability to measure changes in skills, practices and behaviors of EFNEP participants.^{8,12} The decision to use existing ERS data proved to be sound, since the presence of both pre- and post-intervention data made it possible to

identify those graduates practicing optimal nutritional behaviors at exit, but not at entry into the program. Furthermore, the results of this study affirm that data collected through ERS are suitable for application to a cost-benefit framework; whereas, this may not be the case with assessment procedures used in other nutrition education programs.

The major conclusion from the initial results of the cost-benefit analysis, as well as the results of sensitivity analyses conducted in a parallel study, indicate that the Virginia EFNEP generates positive net economic returns. A significant, positive benefit-to-cost ratio has strong implications in terms of justification of the federal resources being spent for the Virginia EFNEP. Results also imply that the EFNEP, nationally, is making contributions to decreased health care expenditures.

One of the major outcomes of this study was the successful application of a cost-benefit analysis to a nutrition education program. Concern about the difficulties of placing an economic value on life has caused some analysts in the field to use a cost-effectiveness approach to evaluate expenditures in health care. Using the cost-of-illness approach made the problem of assessing benefits more manageable, but has its own complexities.¹⁰⁰ Collecting reliable cost-of-illness data was one of the most difficult aspects of conducting this CBA. Data were often unavailable, or were not generalizable to the low-income population, or did not appear to reflect total economic costs of the diseases. The investigators in this CBA utilized a variety of references and databases to obtain the most current and reliable data available, especially on the incidence and treatment cost of diet-related chronic diseases and conditions and the estimated impact of nutrition education on the incidence and severity of those diseases.

Recommendations

Based on the findings of this study, it is recommended that the following considerations be

used as guides in future economic evaluations of EFNEP and in other nutrition education programs:

- 1) A critical assumption in this study was that EFNEP participants would retain positive dietary and food-related behaviors over their lifetime following graduation from the program. This was based on the existence of some studies that have documented the continuation of positive practices among EFNEP participants for as long as five years after graduation.^{8,10} There is need for additional long-term follow-up studies on the retention of positive behaviors to increase confidence in this assumption. If data from such studies were available, it would not be necessary to employ sensitivity analyses using lower rates of behavior retention that result in reduced benefit-to-cost ratios.
- 2) Motivators and reinforcers of behavior change need to be multifaceted and need to be maintained, to enhance long-term retention of positive dietary behaviors and practices. To demonstrate economic benefit, these factors must be aggressively addressed in any nutrition education program.
- 3) In the process of this study, it became apparent that a number of EFNEP evaluation studies had been conducted throughout the nation, but were never published. Had the results of these studies been published, they could have strengthened the assumption that positive dietary practices are acquired as a result of EFNEP and that these practices are permanently retained after program graduation.
- 4) Sensitivity analyses, adjusting the incidence rates of diseases and conditions to be more realistic for the low-income population, resulted in higher benefit-to-cost ratios. Since the majority of EFNEP participants are low-income, it is reasonable to assume that, had data been available specifically for the low-income population for all of the selected diseases, a higher benefit-to-cost ratio would have been generated in the Virginia CBA. Similarly, there exists a

need for more information on the incidence rates of diseases that can be attributed to dietary factors. If such data were available, the design and conduction of CBAs would be much easier.

- 5) The Virginia EFNEP CBA only documented benefits accruing to the participants who received the direct nutrition education, namely those designated as homemakers. Because, by definition, homemakers are responsible for the dietary intake and food-related habits of other family members within the household, it would be interesting to study the spillover effects of the program to other family members. If data were recorded in ERS on other family members, this could be useful in CBAs and would most likely lead to increased benefit-to-cost ratios.
- 6) It is recommended that more questions be included in the food practice checklist to address specific diet and disease-related risk factors, such as the extent and duration of physical activity. Physical activity, or the lack of it, plays an important role in many diseases like Type 2 diabetes, obesity, heart disease, hypertension etc. In addition, there may be other dietary risk factors for chronic diseases that are not currently assessed in ERS, such as dietary sodium, that could be included to enhance results of future CBAs.