**Draft Literature Review on Expanded Food and Nutrition Education Program (EFNEP) Evaluations**

To reduce nutrition insecurity of low-income families and youth today, The Expanded Food and Nutrition Education Program (EFNEP), funded by the USDA’s National Institute of Food and Agriculture (NIFA) is the country’s first nutrition education program established in 1969 and remains at the forefront of food and nutrition educational efforts, which has made many difference in the lives of American families and children (USDA, 2018). Over the years, few studies have attempted to provide evaluation on the economic efficiency of the program due to possible reason such as benefits that cannot be easily monetized or the demand of familiarity with economic concepts and a foundational knowledge in welfare in the use of analytical tools such as the CBA. which is quite lacking among clinicians (Nas, 1996).

In an attempt to address one problem of the difficulty in evaluation of health program which is concerned in calculating the indirect tangible benefits of Virginia EFNEP program using the human capital approach, Edwin (1998), concluded that first, $ 1 million of the total benefits generated by EFNEP was contributed by the indirect benefits and secondly, by the use of sensitivity analysis, there is a positive return on each dollar that is derived from Virginia EFNEP. Lamber, et al(1998), confirmed Edwin’s (1998) findings by using three analytical measures of benefits namely CBA, IRR and NPV that measured the efficiency of Virginia EFNEP. They used 1996 Virginia adult EFNEP self-reported data from the EFNEP Evaluation Reporting System which included pre and post self-reported data on program participants. They concluded that there is a significant return on investment of Virginia EFNEP of benefit to cost ratio of $10.64/$1.00. To address the uncertainty of results that was due to the lack of incidence rates for some of the disease conditions for low income households, a sensitivity analysis was done to adjust the incidence rate for the general population to reflect that of the low-income population. This resulted in a higher benefit cost ratio pf $17.04/$1.00 (Radhika, Ruby H, Lambur, & Lewis, 2002).

In answering the question of whether participation in EFNEP enhances the judicious use of resources by households, improve the intake of nutrients, and the cost needed to improve these behaviors, Janie & Betsy(2002) investigates whether EFNEP participants' saving in food expenditures exceeded program implementation costs. They compare costs from expenditure reports over 6 months and benefits from the amount of money spent on food at program entry and exit which was determined from self-reported 24-hour food recall and survey. Using quasi-experimental, nonequivalent control group design, three treatment groups were used of which two were given nutrition education whiles the third group was not given education. Using EFNEP costs per participants subtracted from the mean change in family food expenditures per participants over a 5-year period at three different discount rates, NPV was calculated which showed that EFNEP is cost beneficial. Their findings showed that participants who graduated from the program reported decrease in family food expenditures by $10 to $20 on the average whiles simultaneously increasing the intake of important nutrients such as iron, vitamin c, vitamin B-6 and fiber.

Dollahite, Kenkel, and Thompson’s (2008) New York state EFNEP study evaluated the costs of program as well as cost to the participants, cost effectiveness, and monetized health benefits of the New York program. In their evaluation, they used measures that account more broadly on societal costs and benefits such as opportunity costs (what society gives up in terms of foregone consumption of other goods and services) to value costs and Quality Adjusted Life Years (QALYs) to value benefits. the CEA and CBA used in this study are like that found in Virginia and Iowa-based studies(put reference). According to their CBA results, they found that the societal willingness to pay for quality life benefit-to-cost ratio was $9.58/$1.00. When the benefits were measured using the narrower definition of benefits valued in terms of the costs avoided in future health costs, the benefit-to-cost ratio was $0.82/$1.00 . Hradek, et al. (2017) uses current information on Iowa’s EFNEP and FNP to evaluate the costs and benefits of the two related programs based on updated data which incorporates current dietary guidance and recommendations collected from the Iowa EFNEP and FNP program. Program benefits were measured as the value of health benefits achieved through changes in nutrition behaviors as the difference in reported behaviors between entry and exit of the program. The updated estimates provide a benefit-to-cost ratio of $2.48/$1.00. when the DRI information is not included, like that used in the previous Iowa study (2001), the benefit-to-cost ratio is $5.44/$1.00 but based on current data.

A research conducted by Koszewski et al, (2011) in one Midwestern state to determine if graduates from either the SNAP-Ed or EFNEP maintained behavioral changes 6 months after completing the program found that 25% (1,100) of the graduates from the two programs, SNAP-Ed and EFNEP , were able to improve and maintain their behaviors from entry and exit of the program, as well as 6 months later. The data was gathered from a 10- or 15-question behavior checklist survey and was analyzed to determine the effectiveness of SNAP-Ed/EFNEP nutrition education at six months post-graduation using Chi Square analysis.

Wardlaw & Baker, (2012) also conducted a Long-term evaluation of EFNEP and SNAP-Ed using checklists and semi-structured interviews to identify the changes in behavior, food and nutrition behaviors as well as other life changes attributed to their involvement in the program over time. The results of the study indicated that following their participation in the program, graduates maintained positive food- and nutrition-related behaviors for about one to four years and they performed these behaviors more often.

The research presented in this subsection indicates positive findings on the economic efficiency of the EFNEP and other related health education programs. Nonetheless, there are quite a number of limitations associated with approached used in the papers such as the use of self-reported data and the assumption of the independence of incidence of chronic disease conditions. The next section of the literature review will look at the biasedness in self-reported data and the use of biometric health data to solve this problem.

References

Arnold, Catherine Greenwell, and Jeffery Sobal. "Food practices and nutrition knowledge after graduation from the Expanded Food and Nutrition Education Program (EFNEP)." *Journal of Nutrition Education* 32, no. 3 (2000): 130-138.

Burney, Janie, and Betsy Haughton. "EFNEP: a nutrition education program that demonstrates cost-benefit." *Journal of the American Dietetic Association* 102, no. 1 (2002): 39-45.

Dollahite, Jamie, Donald Kenkel, and C. Scott Thompson. "An economic evaluation of the expanded food and nutrition education program." *Journal of nutrition education and behavior* 40, no. 3 (2008): 134-143.

Hradek, Christine, Helen H. Jensen, Nicole Schimerowski Miller, and Miyoung Oh. "Evaluation of the Cost and Effectiveness of Direct Nutrition Education to Low-Income Audiences in Iowa: EFNEP and SNAP-Ed graduates practicing Optimal Nutritional Behaviors (ONB)." (2017).

Koszewski, Wanda, Natalie Sehi, Donnia Behrends, and Elizabeth Tuttle. "The impact of SNAP-ED and EFNEP on program graduates 6 months after graduation." *J Extension* 49, no. 5 (2011): 5RIB6.

Lambur, Michael Thomas, Radhika Rajgopal, Edwin Carnell Lewis, Ruby Hurley Cox, and Michael Ellerbrock. "Applying cost benefit analysis to nutrition education programs: focus on the Virginia Expanded Food and Nutrition Education Program." (2009).

Lewis, Edwin Carnell. "Cost benefit analysis of Virginia EFNEP: Calculating indirect benefits and sensitivity analysis." PhD diss., Virginia Tech, 1998.

Nas, Tevfik. *Cost-Benefit Analysis: Theory and Application*. Thousand Oaks: SAGE

Publications, Inc., 1996.

Rajgopal Jr, Radhika. "Cost-Benefit Analysis of the Virginia Expanded Food and Nutrition Education Program (EFNEP)." PhD diss., Virginia Tech, 1998.

Rajgopal, Radhika, Ruby H. Cox, Michael Lambur, and Edwin C. Lewis. "Cost-benefit analysis indicates the positive economic benefits of the Expanded Food and Nutrition Education Program related to chronic disease prevention." *Journal of nutrition education and behavior* 34, no. 1 (2002): 26-37.

Wardlaw, Mary, and Susan Baker. "Long-term evaluation of EFNEP and SNAP-Ed." In *Forum Fam. Consum. Issues (FFCI)*, vol. 17, no. 2. 2012.

Wessman, Cory, Connie Betterley, and Helen H. Jensen. *An Evaluation of the Costs and Benefits of Iowa's Expanded Food and Nutrition Education Program (EFNEP) Final Report*. No. 1038-2016-84798. 2001.

Wessman, Cory, Constance J. Betterley, and Helen H. Jensen. *An evaluation of the costs and benefits of Iowa's expanded food and nutrition education program (EFNEP)*. No. 1865. Center for Agricultural and Rural Development, Iowa State University, 2000.