

Economic Evaluation of Home Visiting Programs

Author(s): W. Steven Barnett

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# Economic Evaluation of Home Visiting Programs

W. Steven Barnett

## Abstract

This article discusses economic evaluation of home visiting programs. Evaluations of this kind, including cost-effectiveness and cost-benefit studies, can help policymakers allocate limited resources and help both program planners and administrators improve their programs. Barnett reviews some of the important considerations when measuring the costs and outcomes of home visiting programs. In the Appendix to this article, he describes the steps that are taken when conducting a cost-benefit evaluation.

Despite the usefulness of economic evaluations, few have been done of home visiting programs. Barnett reviews in detail six studies which looked at the costs and benefits or cost-effectiveness of various home visiting interventions. Several of these studies are also described in the Olds and Kitzman article in this journal issue. Barnett concludes that these studies demonstrate the feasibility of economic evaluation of home visiting and the insights it can produce. He urges that economic analysis be made a regular and recognized part of home visiting research.

**B**ecause the scope and goals of home visiting programs can vary greatly, policymakers and program administrators must make many choices when planning them. Economic evaluation can guide these choices. Economic evaluation is essentially the formalization of an approach used every day: assess the advantages and disadvantages of alternative courses of action and choose the one which, on balance, is best. This approach is used in many fields, including medicine, education, engineering, and law. It is helpful when allocating limited resources and determining what level of investment to make in a program.

Economic evaluation is important when resources are limited. Money is a serious constraint for preventive and early intervention services, which receive a small fraction of the nation's resources compared to programs that deal with medical, educational, and social problems. This ratio might be changed if there were reliable evidence to support the theory that home visiting frees up consider-

ably more resources than it consumes while producing significant improvements in the quality of life. Economic analysis of costs and benefits can provide guidance on the most efficient use of resources for desired outcomes. It may persuade legislatures to increase resources for prevention and early intervention social service programs such as home visiting. However, without accurate information on costs and

*W. Steven Barnett, Ph.D., is associate professor of economics and policy in the Graduate School of Education and senior research fellow at Eagleton Institute of Politics, Rutgers University. Professor Barnett conducted a benefit-cost analysis of the Perry Preschool Program, discussed in the Appendix to this journal.*

outcomes, there is no way to determine the most efficient use of resources.

Despite the potential usefulness of economic evaluations in shaping resource allocation decisions, few can be found among the many studies of home visiting programs.<sup>1,2</sup> One reason may be that the focus of research in recent years has been on determining whether home visiting held any promise as a strategy for prevention and early intervention. Without evidence that a particular approach produces the desired outcomes under at least some

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circumstances, there is little point in asking what it costs or whether it is cost-effective. However, the effectiveness of home visiting has already been studied through various research efforts. It is time for those who study home visiting programs to include economic evaluation in their work. In most instances, an economic analysis can be added to an outcome evaluation at minimal additional cost.

This paper has three objectives: to discuss key factors influencing costs and benefits associated with home visiting programs; to review the existing economic literature on home visiting; and to present in some detail the methodology of economic evaluation and its application to home visiting.

## **Measuring Costs and Benefits of Home Visiting Programs**

Economic evaluation depends on identifying the costs and outcomes of the intervention studied. A detailed description of the steps in economic evaluation is found in Appendix Box A1 (page 107). These steps are summarized in Table 1 (page 95).

### **Determining Perspective**

The first step in an economic evaluation is to define the perspective from which it is to

be conducted. The choice of perspective will be influenced by the goal of the evaluation. If, for example, the goal is to help administrators of a program decide what intervention (for example, home visiting versus center-based service) they should implement, it may be appropriate to focus only on the costs and benefits to the particular program. However, this limited perspective may be misleading to policymakers who are deciding whether to expend public dollars on this or other programs. They will want to know about costs and benefits to society as a whole, whether these costs are direct or indirect, intended or unintended. For example, if a local hospital conducts a home visiting program that results in families using fewer acute services but more community preventive and social services, the total costs and benefits of the program could not be measured by analyzing only the impact on the hospital. If public dollars funded the program, a helpful evaluation would have to include, at a minimum, program cost, costs and benefits to program participants, and the impact on other public expenditures. Similarly, a state may decide to invest in an early intervention project because it attracts three dollars in federal funds for every dollar in state funds, even if other nonfederally supported projects would be more effective. But such a narrow perspective could be damaging to broader public interests; protecting these interests is the special responsibility of government. It is important that evaluators clearly state the perspective from which they proceed and acknowledge the limitations that perspective imposes.

### **Measuring Costs**

Determining the costs of the intervention is central to all forms of economic evaluation. The costs of home visiting programs vary widely because there is no uniform or standardized practice. Home visiting is not so much a well-defined program as a general strategy for delivering a variety of services to parents. Costs will vary according to the population served (pregnant women, new mothers, infants, and/or older children), as well as according to the goals (improved health behaviors, quality of child rearing, or growth and development) of the program, and the type and intensity of the services delivered. For example, estimates from cost studies indicate that the annual costs of home visiting programs (in 1992 dollars) range from less than \$1,000 to more than \$5,000 per family.<sup>1,3-8</sup> Given

Table 1

<b>Steps in Economic Evaluation</b>	
1. Define the perspective of the analysis	Will costs and consequences be measured only for identified individuals or groups, or for society as a whole?
2. Conduct cost analysis	Identify and estimate the value of all resources used, including capital costs, and time contributed by clients and volunteers.
3. Estimate program effects	A strong underlying outcome study of program impact is required. Impact studies should have a sufficiently large sample size, experimental design, broad perspective on the benefits measured, the ability to measure outcomes over a long period of time, and replication in multiple environments.
4. Estimate the value of outcomes	In cost-benefit analysis, the outcomes must be valued in monetary terms. It is important not only to include the cost savings to governmental programs, but also to assign whenever possible a monetary value for outcomes such as level of productivity, effects on nonlabor income, and utilization of health services.
5. Account for the effects of time	Adjust for inflation and discount future benefits to present value.
6. Aggregate and apply a decision rule	Even when the costs and benefits of different outcomes are estimated for comparison, there is no single simple decision rule that can be applied in all circumstances, and decision makers may need to consider more than this information in choosing a course of action.
7. Describe distributional consequences	Who gains and who loses under each option?
8. Conduct sensitivity analysis	Identify critical assumptions made in the analysis and explore the effects of reasonable variations in those assumptions.
9. Describe the qualitative residual	Describe the important program impacts that cannot be monetarily valued or perhaps even quantified.

the size of that range, it is worth considering what aspects of home visiting technology or design have the most influence on cost. Analysis of the information available suggests that the most influential aspects

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are (1) number and duration of visits, (2) home visitor case load, (3) home visitor credentials and characteristics, (4) supervision and administration, and (5) parent time. All of these aspects will vary with the goals selected for the program.

#### **Number and Duration of Visits**

Home visiting programs vary considerably in the number of weeks or months over which visits are provided, the frequency of visits, and the duration of visits.<sup>1,9</sup> For ex-

ample, Olds and colleagues reported costs of \$2,020 (1980 dollars) for a nurse home visiting program with prenatal visits only and \$4,067 when the same program was continued through the child's first two years.<sup>5</sup> These costs included costs for home visiting as well as for linked and transportation services. A nationwide survey of home visiting programs,<sup>9</sup> looking only at programs for families with children under age three, found a wide range of schedules, with 50% of the programs scheduling weekly visits, 12% scheduling visits every other week, 15% scheduling visits monthly or less often, and 22% of the programs following other schedules. Most home visiting programs reported serving families for less than one year, but 31% reported one to two years, and 2% reported more than two years. In addition to frequency, the average duration of visits will affect costs. The survey found that visits usually last 60 and 90 minutes.

#### **Home Visitor Case Load**

Home visiting programs also vary in the number of families they assign to each home visitor and the number of visits each home visitor is expected to make per week. Given a fixed number of visits (hours) to be provided to each family, the greater the number of visits per home visitor, the fewer home visitors the plan will have to employ and the lower the program's cost will be. The number of visits each home visitor is expected to make can vary because of (1) the time required to travel to each visit; (2) the amount of preparation, paperwork, and time spent working to secure and coordinate services from other providers and agencies for families; (3) the hours and effort of home visitors (a full-time visitor may work much more or much less than 40 hours per week); and (4) the time spent in in-service training. While increasing case load is one way to reduce cost, if taken too far, it is likely to reduce quality of service and produce staff burnout and turnover, which can increase costs as well as reduce quality.

#### **Home Visitor Credentials and Characteristics**

The formal credentials required of home visitors vary from a graduate degree in teaching, social work, or nursing to a high-school diploma, to none at all.<sup>9</sup> See the article by Wasik in this journal issue. The costs of home visitors can be expected to differ greatly depending on these qualifications, given that higher salaries will typically



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have to be paid for higher-credentialed staff. Although cost plays a role in decisions about staff qualifications, the program's plan of action (and the relationship of staff qualifications to planned activities and outcomes) is relevant as well. For example, some programs that target low-income or minority families consider similar backgrounds and experiences to be more important than academic credentials when selecting caseworkers. Other programs want home visitors to have specific professional expertise. The characteristics of home visitors can have significant implications for other aspects of program operation related to costs such as the number of visits completed. For example, in a comparison of the costs of four Child Survival/Fair Start programs, Harkavy and Bond found a large variation in home visitor wages associated with variations in the training and experience of home visitors. However, less experienced home visitors made considerably fewer visits per week than did more experienced home visitors, offsetting much of the cost savings from lower wages.<sup>8</sup>

#### **Supervision and Administration**

Supervision and administration can account for 10% to 30% of the cost of a home visiting program. In estimating the cost of programs, especially when projecting the cost of a new program to be added to an existing agency, it is frequently argued that there will be little increase in the agency's administrative bureaucracy. As a marginal addition, the argument goes, the relevant costs of the new program are those associated with the direct service providers and their immediate supervisors. The program can take advantage of the existing administrative structure without increasing its costs significantly, certainly without increasing them proportionately. Whether this argument is valid or not is an empirical question which does not appear to have been addressed by research, though it may be observed that, as government generally has increased in size and complexity, the administrative percentage of costs does not appear to have declined.

#### **Parent Time**

All home visiting programs require parent time, and some programs attempt to employ extensive amounts of parent time by training parents to be teachers and therapists for their own children. These programs may be viewed as keeping costs to the taxpayer low by shifting costs to par-

ents. Most people would not think of parent time as a cost factor. However, if the time required by home visitor programs is significant, it can impose a considerable burden on parents, with potential negative impacts. Families with infants and young children experience significantly greater time pressures than other families, and these pressures are increased by the spe-

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cial needs of a child with a disability.<sup>10</sup> Time required for parents to participate in home visiting services after the birth of a child is time that could otherwise be spent in paid employment, work at home, or leisure. Devoting parent time to the home visiting program might result in (1) less time spent cuddling, playing, or conversing with the infant; (2) less time spent with other children; (3) less time spent with a spouse; (4) an increase in other children's or spouse's household work; (5) reduction in leisure; or (6) reduction in labor market participation and earned income. One response to such concerns has been to teach parents to incorporate the lessons for parenting taught by home visitors into naturally occurring family activities.<sup>11</sup> Of course, in some instances, parents may be socially isolated and view time with a home visitor as a respite, but this cannot be assumed. In addition, it is also possible that parent time devoted to interacting with and learning from the home visitor may, over the long term, be a time saver (and quality-of-life enhancer) for the parent and family by making the parent more efficient at parenting and/or helping the child achieve a higher level of physical, emotional, and cognitive functioning and, therefore, require less time-intensive caretaking by the parents.

#### **Measuring Outcomes**

Economic evaluation also requires identifying the outcomes of the intervention. Home visiting programs encompass a variety of purposes and outcomes, many of which are not ordinarily expressed in

monetary terms. A reasonably inclusive list of potential outcomes of home visiting is shown in Table 2. No program can be expected to produce all of these outcomes, and some programs may produce outcomes that are not listed here.

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Two distinct steps must be taken to measure the outcomes of home visiting programs. The first step is a high-quality study of the effect of the intervention in which careful consideration is given to the elements of experimental design. These elements are discussed more fully in Appendix Box A1, Step 3. The second step is an evaluation of these outcomes according to a consistent measure. The procedure for this evaluation depends upon the type of economic analysis being done: cost-effectiveness, cost-benefit, or cost-utility.

**Cost-effectiveness Analysis**

Typically, cost-effectiveness analysis is used to compare two or more alternative ways of achieving the same goal. In this type of economic analysis, the net monetary value of the resources used to produce a program or policy is estimated and compared with the outcomes that are not valued monetarily. For example, Burkett used cost-effectiveness analysis to compare weekly home visits to biweekly visits in a program that sought to improve the cognitive development of disadvantaged preschoolers.<sup>12</sup> Burkett found that biweekly visits resulted in no diminution of effects on cognitive ability and were much less costly. A change to biweekly visits made it possible to serve nearly twice as many children and families with the same resources.

Unfortunately, cost-effectiveness analysis has limitations when an option is both more costly and more effective and when there are multiple outcomes. In such situations, it is essential that those responsible for the program have a clear understanding of the relative importance of cost savings and possible outcomes. For example, Table 3 presents hypothetical cost-

effectiveness results for a home visiting program that seeks to improve birth outcomes and prevent repeat pregnancies for very young teenagers. Are Programs B and C worth the roughly \$2,000 increase in cost over Program A? The answer depends on the priority assigned to the outcomes. Both programs have fewer low birth weight babies and repeat births than Program A, but is the margin of difference worth the additional \$2,000 per child? If Programs B and C are both worth the extra money, which should be chosen? Program B has a larger effect on low birth weight but a smaller effect on repeat births. Which outcome is more important? Answering these questions requires that one go beyond cost-effectiveness analysis. It should be noted that this problem is not peculiar to cost-effectiveness analysis; efficacy studies have the same problem. When home visiting programs have multiple objectives, effectiveness has no clear measure.

**Cost-benefit Analysis**

Cost-benefit analysis (or benefit-cost analysis; the terms are interchangeable) attempts to address directly the limitations of efficacy and cost-effectiveness studies by translating all costs and effects into a common unit of measure—money. This type of analysis attempts to value all of a program's outcomes, as well as its costs, in monetary terms. It can be used to study a single program (a program, no-program comparison), to compare two or more programs with the same goals, or to compare programs with entirely different goals. The greatest problem for cost-benefit analysis is that it can be very difficult, if not impossible, to estimate a monetary value for some outcomes. This issue is discussed more fully in Appendix Box A1, Step 4. It is important to note, however, that many potential outcomes of home visiting are easily valued in monetary terms. These outcomes include increased productivity for the parents, less reliance on welfare, and reduced need for social services or special education for the child. Most (if not all) benefits can be monetarily valued, and the information from even a partial benefit evaluation can be sufficient to make decisions about the cost-benefits value of the programs. For example if, from looking at just the dollar value of a few outcomes, it is clear that a particular intervention is budget neutral (the costs equal the benefits), and, in addition, there are other desired outcomes that

Table 2

<b>Potential Outcomes of Home Visiting</b>	
<b>For children</b>	
Participation in home visits, which may be enjoyable, interesting, and stimulating Better relationships and interactions with parents Improved health as a result of better care, reduced abuse and neglect, fewer accidents. This can include <ul style="list-style-type: none"> <li>Reduced neonatal mortality and infant mortality</li> <li>Improved birth weight and gestation</li> <li>Fewer birth complications</li> <li>Improved nutritional status</li> <li>Improved health status</li> <li>Fewer injuries</li> <li>Less disability and developmental delay</li> <li>Fewer repeat hospitalizations and acute care visits</li> <li>More regular access to preventive health care, including well-checks and immunizations</li> </ul> Improved development (primarily cognitive, but also social and emotional) as a result of home visit activities and/or better parent-child interaction which, over time, results in increased educational success and greater social adjustment. This can include <ul style="list-style-type: none"> <li>Less disability and developmental delay</li> <li>Better school attendance</li> <li>Greater academic ability and achievement</li> <li>Less grade retention and special education placement</li> <li>Less crime and delinquency</li> <li>Increased educational attainment</li> <li>Increased employment and earnings</li> <li>Increased occupational and social status</li> <li>Improved household management</li> <li>Higher quality community participation and leisure</li> <li>Better family relationships</li> <li>Greater control over timing and number of children</li> </ul>	
<b>For parents</b>	
Home visits and related social activities Better relationships with and support from other family members, greater confidence in and satisfaction with parenting Improved health as a result of better care. This can include <ul style="list-style-type: none"> <li>Fewer birth complications</li> <li>Improved nutritional status</li> <li>Improved health status, less illness</li> </ul> Increased education and training Increased employment and earnings (directly or indirectly, as a result of increased education) Improved socioeconomic status and self-sufficiency Improved timing and spacing of births, possibly with reductions in the number of children	
<b>For taxpayers</b>	
Reduced government expenditures (including administrative costs) for <ul style="list-style-type: none"> <li>Health care</li> <li>Education</li> <li>Social services</li> <li>Welfare payments</li> <li>Criminal justice system</li> <li>Food stamps</li> <li>Foster care</li> </ul> Increased tax revenues <ul style="list-style-type: none"> <li>Payroll taxes, sales tax, other</li> </ul> Decreased social problems <ul style="list-style-type: none"> <li>Poverty and economic inequality</li> <li>Crime and delinquency</li> <li>Teenage pregnancy and unwanted children</li> <li>Child abuse and neglect</li> </ul> More competent and fully participatory fellow citizens	

Table 3

<b>Hypothetical Cost-effectiveness Results for Home Visiting with Young Teen Mothers</b>			
Alternative	Cost	Effects	
		<b>Low Birth Weight<sup>a</sup></b>	<b>Second Baby<sup>b</sup></b>
Program A	\$2250	10% fewer	22% fewer
Program B	\$4275	22% fewer	36% fewer
Program C	\$4290	15% fewer	45% fewer

<sup>a</sup> Reduction in percentage of low birth weight births  
<sup>b</sup> Reduction in percentage with second pregnancies within two years

were not measured in monetary terms, a policymaker may well decide to go ahead with the program. The cost-benefit analysis produced sufficient information about the program even though all outcomes were not measured in dollar

ings are then used to calculate cost-utility ratios as a guide to decisions about alternatives. Cost-utility analysis is much less frequently encountered than the other two approaches, perhaps because of the difficulty of establishing the validity of the cost-utility ratios.<sup>13,14</sup> In fact, like cost-benefit analysis, cost-utility analysis requires devising a new way to value measured outcomes. Reaching consensus about the adequacy of this new valuation can be as difficult as assigning monetary values to outcomes.

The final steps of economic evaluation are common to all three types. After costs have been calculated and outcomes measured and valued, the evaluator will undertake a number of tasks to further refine the evaluation. These include accounting for the effects of time, deciding upon the criteria for decision making, reviewing the assumptions underlying the analysis, and considering outcomes that may not have been included in the analysis. See Appendix Box A1 for further discussion.

### ***Only six studies were found that attempted an analysis of costs and benefits for home visiting with families of children under age three.***

terms. Often, cost-benefit analyses remain incomplete, with monetary values estimated for some effects and not others; but even an incomplete analysis may provide an adequate basis for choosing among alternatives.

#### **Cost-utility Analysis**

Cost-utility analysis may be useful when there are multiple outcomes and the problem of estimating their monetary value proves intractable. Such analysis estimates the monetary value of costs and uses a subjective but consistent value scale to measure outcomes not easily valued in monetary terms. In this approach, costs are estimated and then the measures of each effect are subjectively rated by program administrators, clients, experts (or whoever is perceived to be appropriate for decision making) in such a way that they can be aggregated into ratings for the overall value of each program's effects on a common utility scale.<sup>13</sup> These overall rat-

### **Review of Existing Cost-effectiveness and Cost-benefit Analyses**

Very little is known about the economic costs and benefits of home visiting. Most of the effectiveness studies reviewed in the Olds article in this journal issue did not include an economic evaluation. Only six studies were found that attempted an analysis of costs and benefits for home visiting with families of children under age three. These programs varied greatly in

their goals, methods, and target populations but can be roughly clustered into three groups: (1) home visits after early hospital discharge, (2) educational home visits combined with developmental child care and other services for low-income families, and (3) health-organization-sponsored home visits aimed at improving parental care of infants and child health and development. As the following discussion shows, these studies relied on rather narrow definitions of cost (for example, they did not consider parent time), and they valued only selected benefits to which monetary values could easily be assigned.

### Early Hospital Discharge

Two studies were primarily concerned with the medical cost savings from early hospital discharge following childbirth. Yanover and others compared traditional practices to a new "family centered perinatal care program" that included prenatal classes, early discharge from the hospital, and daily home visits for the first four days following childbirth by a nurse practitioner.<sup>15</sup> Mothers judged to be at low risk of perinatal medical problems were randomly assigned to one of the two groups during pregnancy. Those assigned to the family-centered perinatal care group were more likely to use only local anesthesia during delivery and, as expected, were discharged an average of 42 hours earlier. No significant differences were found in frequency or type of morbidity for either mother or infant through the six-week follow-up period. To some degree, the extra costs of this program were offset by the reductions in costs that resulted from early discharge, but no precise estimates of program costs or cost savings were reported.

Brooten and her colleagues conducted a randomized trial with families of very low birth weight infants, comparing routine hospital nursery discharge to early discharge with nurse home visits, individualized instruction, counseling, and telephone access to a nurse specialist.<sup>16</sup> Home visits were made in the first week after discharge and at 1, 9, 12, and 18 months. The nurse telephoned parents at least three times a week for the first two weeks and weekly for the next eight weeks. The early discharge group was released from the hospital 11 days earlier on average. In an 18-month follow-up, no statistically significant differences were found for repeat hospitaliza-

tions, acute care visits, failure to thrive, reported abuse, or foster care placement. However, sample size was quite small (36 families in each group) for detecting effects on low incidence events.

Brooten estimated the benefits based on reductions in medical costs associated with early discharge. Hospital and physician charges for the early discharge group averaged \$19,136 less per child. The costs

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of the early discharge program were estimated to equal \$576 per child based on the costs of the nurse providing the services and the costs of telephone calls and travel. Brooten and his colleagues recognized that their cost and benefit estimates were not strictly comparable. The cost estimate included only increases for variable costs (with nothing for the costs of space, for example) while the benefit estimate was based on hospital charges which could have exceeded actual costs. Nevertheless, the difference in magnitudes of the cost and benefit estimates was sufficiently large that greater precision is not required to conclude that early discharge was highly efficient.

One concern with both of these early discharge studies is that it is difficult to judge the importance of nurse home visiting to the production of benefits. The benefits might simply have resulted from the early discharge policy. In the study by Yanover and colleagues, the prenatal classes, interactions between parents and hospital staff in the period immediately following the birth, and the provision of home visits all may have contributed to the willingness of parents and staff to accept early release. As there has been little incentive in the medical system to restrain costs, hospitals and physicians might be expected to be overly conservative in their discharge policies. The same benefits without an increase in morbidity might have been observed with fewer or perhaps even

no nurse home visits. Such variations in services were not attempted.<sup>17</sup>

### **Educational Home Visits and Child Care**

Two studies examined the benefits of a social support program, including home visits, for mothers and children in low-income families where one of the program goals was to improve child development. Seitz reported the results of a 10-year follow-up of low-income first-time mothers who had been provided home visits (begun prenatally), pediatric care, and educational day care until 30 months postpartum.<sup>18</sup> A time-lag comparison group was used. The same procedures used to identify the intervention group were applied to a later birth cohort to obtain a comparable pool from which matches were drawn for each intervention

but found significantly better grades and school attendance for girls and significantly less juvenile delinquency for boys in the group that received the home visits. The researchers estimated annual costs per child from delinquency to be \$186 for the intervention group and \$1,985 for the comparison group (by age 13 to 16 depending on the cohort).

These studies provide a very partial assessment of economic costs and benefits. They indicate the potential of home visiting programs to produce substantial economic benefits and suggest that more comprehensive economic evaluations of benefits could provide enough information to assess whether the overall economic impact of the programs was positive. However, it is impossible to assess the contribution of home visits to the overall results from these studies alone. For example, they did not attempt to separate out effects of home visiting from the other elements of the intervention, such as the child care and medical care provided. Even when the full range of efficacy studies is considered (see the article by Olds in this journal issue), the extent to which home visits add to the effects of center-based care and education programs is unclear, as is the efficacy of home visits alone.<sup>20-23</sup> However, the length of follow-up in these efficacy studies tends to be short, and the number of other potentially important variations among studies are large, making it difficult to draw firm conclusions. Further research comparing the costs and benefits of home visit and center-based programs alone and in combination is clearly desirable.

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child. Despite the small sample size ( $n=28$  at follow-up), the intervention mothers were found to have a significantly higher educational attainment, higher employment rate, and lower birth rate 10 years later. Intervention children had better school attendance records and were less likely to be in special education. Program cost was approximately \$20,000 over the 2½-year intervention, while the value of added earnings and reduced special services was just over \$48,000 (\$2,000 per child) for the follow-up year (both figures in 1982 dollars, but undiscounted).

Lally and colleagues reported the results of a long-term follow-up of participants in the Syracuse University Family Development Research Program.<sup>19</sup> Very-low-income women in the third trimester of pregnancy were enrolled in an intervention focused on improving child development through home visits and educational day care through age four. Comparison to a matched sample (formed when children were age three) 10 years later revealed no significant differences in the parents' education or employment,

### **Health-oriented Home Visits**

Two studies investigated the costs and benefits of home visiting programs sponsored by medical organizations in the hope of improving infant health and development. Hardy and Streett employed a randomized design to examine the impact of home visitation aimed at improving parenting and compliance with routine infant health care visits to a well-child clinic.<sup>6</sup> The population served was inner-city African-American mothers over age 18 and their infants. The visits were provided by a college-educated African-American woman who had lived in the community. She was supervised by an educator at the clinic and worked closely with a clinic social worker. Visits began 7 to 10 days after birth. It was found that the home visitor had to provide

a very broad-based intervention dealing with a wide range of day-to-day social and economic crises before mothers could attend to improving parenting and child health care.

Hardy and Streett conducted a kind of rudimentary cost-benefit analysis based on data readily available from the study. During a two-year period of visitation, estimated costs of the visits were found to be more than offset by reductions in medical care costs for the children. This occurred even though the visited children were more current in their immunizations as a result of improved compliance with the clinic's well-child care schedule.<sup>24</sup> Cost reductions reflected reductions in clinic visits related to illness and injury as well as reductions in hospitalizations.

The cost-benefit analysis could have been carried further, though this would be unlikely to change the conclusion derived from the rough analysis conducted. For example, the cost estimate did not include the time of the clinic's educator and social worker, who may have been critical to success, nor were any facilities costs included.

No estimates were made of the value of health improvements per se or of the value of reductions in abuse and neglect (apart from reduced medical costs). Hardy and Streett noted, but did not estimate, possible savings to the Department of Human Services from reductions in abuse and neglect. Neither costs nor benefits were discounted or adjusted for inflation, but the relatively short time span and the continuation of costs throughout the period tend to reduce the importance of this flaw. Finally, it would have been interesting to know if benefits continued beyond the end of the home visits.

Olds and colleagues provide the most thorough economic evaluation to be found in the literature on home visiting programs.<sup>5</sup> This evaluation was based on a randomized trial of a nurse home visiting program conducted with a relatively large sample of 400 women expecting their first child in Elmira, New York. Low socioeconomic status, teen, and unmarried women were actively recruited, but other volunteers were included in the study. The study compared four alternatives. Two were minimal and are combined for analysis. In the other two, nurses began visiting mothers prenatally. Visits continued until child-

birth for one group and until the first child was two years old for the other. The program sought to improve (1) pregnancy outcomes, (2) parental care of children and children's health and development, and (3) maternal life-course, including increased employment and the prevention of undesired pregnancies. Analyses presented were limited to whites because of the small number of nonwhites ( $n=46$ ).

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*Olds and colleagues provide the most thorough economic evaluation to be found in the literature on home visiting programs.*

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Basic findings of this study were that the two groups which received home visits experienced (1) improved use of prenatal services; (2) fewer low birth weight babies to teens under 17 years of age and increased gestation for children of women who were moderate to heavy smokers at entry; (3) more low birth weight babies born to older nonsmokers (attributed by the investigators to initial differences between groups); (4) fewer verified cases of child abuse and neglect for low-income women; (5) improved cognitive development for children of low-income teenagers; and (6) increased maternal employment and fewer repeat pregnancies for low-income women in the four-year follow-up period. In each instance, statistically significant improvements were found only for subsamples and not for the entire sample. While it might be expected that the greatest effects would be concentrated among those at greatest risk because of poverty, youth, and health-related behaviors, it is extremely important that replications seeking to verify these findings regarding subsamples (such as Olds is currently conducting in Memphis, Tennessee) be supported.

The economic evaluation focused on the costs of the program and estimated reductions from a government budgetary perspective associated with the home visiting program's positive outcomes. All costs of the alternative treatments (minimal, prenatal, and postnatal) and ancillary services to which families were referred—for example, the Special Supplemental Food Program for Women, Infants, and Chil-

dren (WIC)—were estimated for each treatment condition. Government program savings were estimated from reduced demands on four government programs—Aid to Families with Dependent Children (AFDC), Medicaid, food stamps, and Child Protective Services.<sup>25</sup> Effects on income tax payments were estimated from earnings and included in the total “government savings” figure. Increased tax payments by program participants can potentially reduce the burden on other taxpayers and thus, from the taxpayers’ perspective, can be considered equivalent to a reduction in program costs.

The primary sources of government cost savings were increased employment and smaller family size.<sup>26</sup> Reductions in use of AFDC and food stamps attributable to these effects accounted for 82% of the estimated cost savings. Thus, it is not surprising that the home visits continuing to age two were found to produce government cost savings while visits conducted only prenatally were not. The government cost savings were estimated to be larger for low-income families, and it is only for the low-income subsample that the estimated savings achieve statistical significance.

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***The primary sources of government cost savings were increased employment and smaller family size.***

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To compare program costs and government cost savings, all estimates were made in 1980 dollars and discounted to calculate present value. (See Appendix Box A1, Step 5.) Comparison of present values indicated that four years after the birth of the first child, government cost savings slightly exceeded net program cost (that is, net of the cost of minimal services) for low-income participants and accounted for roughly half the costs for the sample as a whole. As lower-income families accounted for more than half of the sample, it appears that cost savings for higher-income families were not merely lower, but virtually nonexistent. In extrapolating these results to policy, it would appear that no cost savings should be expected for higher-

income families (though it should be noted that the term low income was not actually measured but rather was defined by an index of socioeconomic status).

The analysis of cost savings was deliberately conservative in two ways that tend to increase the confidence that can be placed in its conclusions. First, no extrapolations were made for future cost savings. Yet, it is reasonable to expect that substantial cost savings would continue for at least a few years beyond the four-year follow-up period and might continue for many years. Second, the estimated cost savings included none of the administrative costs of welfare programs, none of the overhead and non-personnel costs of protective services, and no revenues from taxes other than those directly assessed on earnings.

This study of government cost savings is suggestive of the potential for a comprehensive study of the costs and benefits of home visitation from the perspective of society as a whole, even when the follow-up period is relatively short. Such a cost-benefit analysis would differ from the analysis in the Olds study in important ways. For example, the benefits from increased employment and delayed child-birth would be the increased productivity (measured by employer costs, which exceed gross income); improved quality of life (not just more income, but more income per capita); decreased administrative costs for AFDC, food stamps, and Medicaid; and decreased medical costs regardless of who paid for them. The benefits from improved child health and development and decreased abuse and neglect would be the value of these outcomes per se, as well as the reductions in medical costs, Medicaid administrative costs, and protective services costs.

From the Olds analysis, it appears that most of the information needed to produce such a cost-benefit analysis is readily available. The only benefits that would present any real difficulties are the value of improvements in health and development per se. Reasonable estimates might be developed for some of these, particularly for the prevention of serious injuries caused by abuse and neglect where data on risk premiums and court-ordered compensation for injury might be used. Even a rough calculation based on the data provided by Olds and his colleagues is sufficient to indicate that social benefits would

greatly exceed the estimated government cost savings (the value of increased productivity should substantially exceed the welfare and tax savings). Thus, for a low-income population, at least, the home visiting program would be likely to pass a cost-benefit test based only on four years of data and only those benefits that could be monetarily valued.

The Olds economic evaluation suggests that the economic payoffs of home visiting exist only when these services are targeted to low-income families. While it is possible that benefits for higher-income families were present (though perhaps smaller) but did not result in government program cost savings (for example, earnings of higher-income families could be increased without any decrease in welfare payments), results reported elsewhere indicate that effects were largely limited to lower-income families (see the article by Olds and Kitzman in this journal issue). Of course, there may be other factors that affect a decision to provide such services to high-income families. (See the article by Kamerman and Kahn regarding universal programs in Europe in this journal issue.)

## Conclusion

Economic evaluation can be used to improve home visiting policy and practice and to direct resources to the most effective programs. Existing studies demonstrate that economic evaluation of home visiting is feasible and can produce valuable insights. Even agencies that routinely provide home visiting services could use the logic of economic evaluation (and perhaps simple cost-effectiveness comparisons) to systematically seek out opportunities for improvements in practice by experimenting and then collecting and analyzing information on costs and outcomes.

Sponsors of research on home visiting programs should strongly encourage, perhaps even insist on, the inclusion of economic analyses in major research projects aimed at generating knowledge regarding the usefulness of home visiting programs. The addition of economic analysis to research studies involves relatively little cost and effort. Evaluating the outcomes of the intervention is typically the most expensive part of evaluation; once that is done, cost-benefit analysis is not very difficult or expensive. Attention to costs would improve descriptions of home visiting pro-



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grams and facilitate comparisons across studies. Planning such analyses can also yield very helpful insights about the meaning and usefulness of the underlying outcome evaluation. For example, if 10, 20, or even 30 years of follow-up are needed to investigate the economic returns of home visiting programs, this implies that shorter studies inadequately measure effects. If cost-benefit analysis requires that data be collected on additional outcomes, this implies that the efficacy analysis was omitting important outcomes.

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***Economic evaluation can be used to improve home visiting policy and practice and to direct resources to the most effective programs.***

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Not every study of home visiting must include an economic analysis, although most would benefit from a cost analysis. In particular, studies with only brief follow-up periods might be used to identify promising approaches and delineate key issues. This process can lead to more definition of the intervention to then be followed by more comprehensive and

long-term evaluation, including economic evaluation.

The research reviewed in this paper and in this journal issue provides some ideas that should shape future benefit-cost studies. Two-generation programs that address the needs of parents and children have the potential to produce large benefits in the near term as well as the long term, and therefore appear to be an important focus for economic evaluation. In addition, results to date suggest a focus on interventions targeting low-income expectant mothers and other high-risk subpopulations that have been found to be more responsive to home visiting (although the appropriate income cutoff is unclear, as are many other parameters that need to be specified in designing a program). Research on the combination of home visits addressing a broad spectrum of family needs with the provision of high-quality early childhood education might be another productive focus. Such studies should seek to identify the subtle differences in person, process, and context that appear to have important impacts on benefits.

While the potential value of information produced by benefit-cost analyses is no assurance that it will be used to make decisions, the experience of the Perry Preschool study is persuasive.<sup>27</sup> The Perry Preschool study is only one of several randomized trials of preschool programs for children from low-income families

having long-term follow-ups. Moreover, it is quite small ( $n=123$ ) and limited as a basis for generalization to national policy. Nevertheless the Perry Preschool study is by far the most frequently relied upon study of early intervention in the political and policy arenas. The disproportionate influence of this study is largely attributable to its benefit-cost analysis and suggests that there has been a substantial underinvestment in benefit-cost analyses of early intervention.

If benefit-cost analyses are so useful, why have so few of them been conducted? Lack of knowledge may be one reason. Researchers, evaluators, and program administrators rarely have enough training in economic analysis to appreciate its potential, much less to apply its process. However, a more important reason may be the reluctance to evaluate and discuss the value of human services programs in monetary rather than human terms. All too often, public agencies have sought larger budgets as the primary means of achieving better outcomes and have measured program quality in terms of units of services provided rather than results achieved. This problem can be exacerbated by the reluctance of human services program directors to assign dollar values to the life-enhancing outcomes they seek to produce. However, doing so can be one of the most powerful ways to galvanize public and political support for family-oriented programs.

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Appendix Box A1 begins on page 107.

## Box A1

### Steps in Economic Evaluation of Home Visiting Programs

The steps involved in cost-benefit evaluation are discussed below, but the exposition is necessarily quite limited. Readers who wish further information can consult one of many excellent texts.<sup>13,28-30</sup> Several articles on the application of economic evaluation to early intervention, including the long-term analysis of the High/Scope Perry Preschool study, may also be of particular interest.<sup>1,3,31,32</sup>

**Step 1: Define the scope of the analysis.**

The first step in an economic evaluation is to define the alternatives to be evaluated and the perspective from which the evaluation is to be conducted. It can be argued that all economic evaluations should be conducted from the perspective of society as a whole. This means casting a wide net in research to identify costs and consequences, intended and unintended, for everyone impacted. (See further discussion in the text.)

**Step 2: Conduct cost analysis.**

The purpose of cost analysis is to identify and estimate the value of all resources used. Factors affecting this analysis for home visiting programs are discussed in the text. The standard approach to cost analysis has been described by Levin as the construction of an "ingredients" model or recipe.<sup>13</sup> The first step is to develop a list of all of the ingredients and the amounts of each that are needed. The second is to determine the economic cost of each ingredient. The sum of the costs produces an estimate of the total cost of the program.

For most home visiting programs, ingredients could be listed in each of the following categories: personnel, occupancy (facilities, utilities, communications), equipment, materials, and supplies. Subcategories in personnel might include (1) paid direct service personnel, (2) paid supervisory and administrative personnel, and (3) volunteers. Within each of these personnel categories would be listed individuals and their qualifications.

Once the ingredients list is specified, the cost of each resource must be estimated. The key to estimating cost correctly is understanding that the true cost of a resource is its "opportunity cost," which is the value of the lost opportunity to use it elsewhere. This holds true whether the resource is paid for by the program, paid for by another program, or volunteered.

Because most resources are bought in competitive markets, the best estimate of a resource's opportunity cost usually is what was paid for it. Capital costs, volunteers, and donations present special difficulties for cost analysis and require that the cost analysis go beyond the use of budgets and prices paid to estimate cost.<sup>13</sup> However, as previously discussed, the most important difficulty for home visiting programs may be the valuation of parent time.

The time parents contribute is valuable and should be included in the analysis. Parent time can include not only the time parents devote to the visit, but also the time they spend doing activities prescribed by the home visitor. There are several ways to estimate its value. One way is to estimate what the program would have to pay to hire the parents. Another is to try to estimate the value of the activities that parents give up in order to participate. In both instances, the costs of parent time should be expected to vary considerably from person to person. Unemployed and isolated parents with restricted opportunity for adult contact may regard the time cost of home visits as less than zero if the visits address their needs. Poor working parents with long hours and little leisure may view the time costs as extremely high, so high that they choose not to participate in the home visits.

It may be a useful process for program planning staff to estimate a value for parent time for several categories of their typical clients (single parents, unemployed, marginally employed, recent immigrants, limited-English speakers). If wide variations are found in the value of parent time contributions versus the value of the program as perceived by participating parents, those variations are likely to affect client retention and should be considered in recruitment or screening of prospective clients.

**Step 3: Estimate program effects.**

Every economic evaluation is built on an evaluation of program effects and can be no better than that underlying evaluation. The complexities of research on human development make strong studies of the effects of home visiting difficult and expensive. Bronfenbrenner has extensively explored the implications of ecological theories of human development for research, emphasizing the need for studies that anticipate the interactions of person, process, and context.<sup>33</sup> Based on theory and on weaknesses in past research, more attention needs to be paid to the following to improve efficacy studies as a basis for economic analysis:

- **Large sample size.** Program effects can be expected to vary with age, gender, race/ethnicity, and economic condition of the family.<sup>2,33,34</sup> To account separately for treatment effects for each age-sex-race-in-



## Box A1 (continued)

**Steps in Economic Evaluation of Home Visiting Programs**

come category requires much larger sample sizes than are common in home visiting studies or the pursuit of multiple trials on highly homogeneous samples. Not only are studies of 30 to 60 participants likely to be inadequate, but even much larger studies can encounter problems. Stratification of samples by these variables and others predicted to be important should be standard practice. For example, Olds and his colleagues essentially lost 46 minority cases because that subsample was too small to yield statistically significant results.<sup>5</sup> In addition, a number of low incidence conditions that may be prevented—for example, very low birth weight, infant mortality, and severe disability—are extremely important because of their high costs. Yet they cannot be evaluated without a very large sample size given their low incidence rate.

- **Experimental design.** There should be a strong presumption in favor of true experimental designs (including random assignment) for studies of program effects. Nonexperimental and quasi-experimental designs are subject to an extensive and potentially damaging array of threats to validity.<sup>35</sup> True experimental designs are extremely persuasive with the general public, and quasi-experimental studies are apt to become embroiled in contentious debates about the implications of complex statistical procedures. Unfortunately, knowledge of the advantages and disadvantages of alternative statistical techniques for the analysis of quasi-experimental data is incomplete.<sup>35</sup> When true experimental designs are not possible, researchers should rely on some of the stronger quasi-experimental designs which are used more often.<sup>35</sup>
- **Measurement of process.** Many studies could increase confidence in the validity of their effect estimates if they also collected data on home visit implementation and family interactions. Such process studies measure not only outcomes, but also what happened during the delivery of home visiting services. Too often programs and families are treated as "black boxes," and studies provide little information about what happened while the service was being provided. What were some of the problems encountered? What were some of the benefits perceived by family and home visitor which were not measured as outcomes? Collecting such "process" information might help answer questions about whether null findings or apparent negative effects were the result of incidental differences between treatment and control groups, problems in program implementation, or unanticipated consequences of a home visiting program.
- **A broad perspective in outcomes measured.** The need for a broad perspective in efficacy studies should be evident. Even narrowly focused programs may produce a broad range of outcomes because of the web of relationships linking outcome variables. For example, a program that reduces teenage pregnancy is likely to also affect maternal educational attainment, employment, and earnings.<sup>36,37</sup> In turn, there is strong evidence that mothers' education, family income, and family size have effects on child development and educational success.<sup>38,39</sup> Improved educational success by itself appears to produce an extensive and varied array of benefits for individuals and their families.<sup>40</sup>
- **Long time horizons.** Home visiting programs often seek improvement in child development. Yet, such development evolves over time in interaction with changing environments. While it is generally recognized that useful studies of program effects on development must be longitudinal, few studies have the 15- to 20-year time horizon required to obtain reasonably complete estimates of the effects of prevention and early intervention programs. One of the reasons that such a long period of time is required is that some types of effects exhibit dissipative patterns (e.g., IQ gains) while others appear to be cumulative (e.g., school success). The existence or scope of such effects may not be detectable until the children reach adolescence. In addition, some effects are apparent only as participants move into different environments (e.g., mothers going back to school and then into the workforce, children entering school). Finally, evaluation of some effects plays out over long periods of time. For example, improvements in mothers' education and family size can shift lifetime earnings profiles upward and permanently increase per capita family income.
- **Replication in multiple environments.** Multiple site studies or replications in different environments are required to provide accurate estimates, which vary across environments. For example, neighborhood effects including a lack of social capital may make it much more difficult to produce the same magnitude of effects in the urban "underclass" neighborhoods of cities like New York, Chicago, Detroit, and Philadelphia than in smaller cities and suburban and rural areas.<sup>41,42</sup> Local variations in labor market conditions; availability of education, health, and social services; eligibility requirements and payment levels for welfare; and school policies also can be expected to affect the magnitude of many program effects. For



example, if one of the expected outcomes of home visiting is improved school performance, achieving and measuring this benefit will be affected by variations in school policy. One school might have a policy of never retaining students in grade while another school might have a very liberal policy (e.g., retaining 60% or more of children).

#### Step 4: Estimate the monetary value of outcomes.

Assigning a monetary value to outcomes is a key step in cost-benefit analysis. Doing so can be difficult in home visiting programs because many of the potential outcomes are not viewed as primarily economic and are produced outside the market sector of the economy. Thus, there are no easily obtained market prices for them.

Because of the difficulties (emotional and practical) of valuing many program outcomes, there is a tendency in cost-benefit studies to focus outcome analysis only on savings in the costs of government programs that respond to medical and social problems. While these cost savings are important, they represent a very limited portion of the potential benefits, both because not all outcomes have associated government program cost savings and, even when such cost savings exist, they are likely to be less important than the direct benefits of preventing the problems they address. For example, a home visiting program may aim to improve parents' confidence in their child's cognitive potential as well as to improve the child's school performance. More or less parental confidence has no direct impact on government spending. And even though the child's school performance may decrease government spending for special education, that decrease is not the only outcome of value. Improved school performance could also make the child happier or more productive as an adult. For these reasons, exclusive focus on government cost savings can be misleading.

The potential outcomes of home visiting (see Table 1 in text, page 95) are clearly much more extensive than those actually estimated in studies to date. While the practical difficulties of estimating the dollar value of all of these outcomes are real, they should not be overemphasized. Even if it is not possible to estimate precisely the dollar value of every outcome, it may be possible to provide useful estimates for several key outcomes along several dimensions. For example, Haveman and Wolfe review a large literature on the benefits of education that measure this benefit not only according to increased monetary compensation from employment, but also according to its effects on nonlabor income, health, leisure, crime, and family formation.<sup>40</sup> The monetary value of many of the other outcomes in Table 1 seem similarly estimable.

Because of the difficulties in measuring some outcomes in dollar terms, a method called *contingent valuation* has been developed. In this process, measures of the value people attribute to benefits for which there are no market prices (air quality, for example) are derived through the use of hypothetical questions. However, its success has not been sufficient to recommend its widespread use.<sup>43</sup> Perhaps the most relevant example is the attempt by Escobar, Barnett, and Keith to estimate parents' valuation of early intervention for children with disabilities with contingent valuation techniques.<sup>44</sup> Parental responses were qualitatively consistent with the expectations of economic theory, but the dollar amounts parents reported as the value of the services were extremely low, perhaps unrealistically so. This mixed success tends to reinforce economists' traditional doubts about the usefulness of the hypothetical questions as a means of estimating valuation.

Finally, one critical distinction in benefit estimation is the difference between a cost or benefit to society as a whole and a *transfer payment*. Taxes and welfare payments are transfer payments; they shift resources from one person to another, but do not affect the total amount of resources available to society. Thus, they are of considerably less economic significance than costs and benefits to society as a whole. For example, a reduction in medical costs as a result of improved health habits or routine care frees up all of those resources for other uses. A reduction in welfare payments (without any change in productivity, earnings, or other effects) is important from the perspective of society as a whole only to the extent that it reduces the costs of welfare payment administration, which is likely to be merely 10% of the payment amount. Obviously, transfers may be more important politically because people do care about the distribution of costs and benefits, a subject discussed further below. In addition, it may make a significant difference to the individual if he, rather than the government, pays for his food.

#### Step 5: Account for the effects of time.

A significant amount of time usually passes between the provision of home visiting services and their effects. Thus, in valuating costs and benefits, a two-part adjustment must be made to account for the effects of time—one for changes in prices and the other for the opportunity cost of resources. Change in prices is a purely monetary phenomenon and relates only to monetary estimates of costs and benefits. The effects of year-to-year price changes can be removed by converting dollars from different years into their equivalent "real" (constant dollar) values in a single year.



**Box A1 (continued)****Steps in Economic Evaluation of Home Visiting Programs**

In addition to adjusting for price change, it is necessary to account for the opportunity cost of resources over time. A dollar today is worth more than a dollar received next year, even after adjusting for inflation, because the dollar today can be used now. The interest rate which translates the real value of resources in one year to their real value the next is called the *real discount rate*. There are a variety of ways to use the discount rate in economic evaluation, but the effect in all cases is to reduce the value of later costs or outcomes exponentially compared with earlier ones. It is important to note that this is not exclusively a monetary phenomenon but applies as well to nonmonetary estimates of effects in cost-effectiveness and cost-utility analyses.

**Step 6: Aggregate and apply a decision rule.**

Once the valuation of costs and outcomes is complete and differences caused by timing have been taken into account, costs and outcomes can be summed across years. While these summary calculations are informative, more data are often needed to decide which program is the best alternative. There are no simple decision rules that can be applied to select the best alternative in all situations.<sup>28</sup> Many factors might affect the relevance of the study for policymakers desiring to implement programs. For example, differences in scale of operation and population coverage between the alternatives when studied and when implemented, variations in the completeness with which effects were measured and valued in the studies, the budgetary context for the policymakers' decision, and other factors complicate selection of the "best" alternatives.<sup>45</sup> In most instances when comparing two programs, the appropriate efficiency criterion is whether the marginal increase in benefits is worth the marginal increase in costs. (See Table 3 in text, page 100.)

**Step 7: Describe distributional consequences.**

Policies and programs can differ in their distributional consequences—who gains and who loses—as well as in their economic efficiency. One project may benefit the poor more than the rich and another, the rich more than the poor. One may benefit only a narrow class of people and another, a broad spectrum of society. Obviously, people care a great deal about these differences. A useful economic evaluation describes the distribution of costs and outcomes in relevant ways. The distribution of costs and benefits (or effects) between the intervention targets and the general public is one of the most commonly examined. This breakdown is interesting because intervention and prevention programs often target groups believed to merit special consideration as a result of poverty or disability. Also, it is easier to persuade taxpayers and their representatives to pay for a program if it serves self-interest as well as altruism.

**Step 8: Conduct sensitivity analysis.**

Researchers inevitably rely on assumptions as well as evidence in conducting cost-benefit analyses. These assumptions may or may not hold, so the degree to which the conclusions depend on them matters. Sensitivity analysis is used to identify critical assumptions and explore the effects of reasonable variations in the assumptions on the conclusions. For example, if a tight labor market is required for a home visiting program to produce impacts on employment and earnings, then these benefits should not be expected if the program is implemented in an area of high unemployment. If a home visiting program depends on referrals to supporting health and social services in producing its benefits, then it should not be implemented without the supporting programs. This does not mean that a home visiting program cannot be implemented in areas that do not have the supporting programs, only that these supporting programs must be introduced as part of the intervention and their costs and benefits taken into account. Or, if they are not introduced, the outcomes from these programs may be very different.

**Step 9: Discuss the qualitative residual.**

All economic evaluations have measurement limitations that need to be discussed as part of the basis for making decisions. In research on home visiting programs, the most important limitation may be the failure to value monetarily or even to quantify all of the important outcomes. Even when outcomes cannot be quantified, however, it may be possible to bring them into the analysis by describing them. Participants' own descriptions presented verbatim are often the best way to convey such essential intangibles as quality of life, personal empowerment, increased willingness to take responsibility for personal and community well-being, and hope for the future. This kind of descriptive report may be the only way to assure that such important human considerations are not omitted. ♦

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